START

Title: OFFICIAL GAZETTE OF THE UNITED STATES PATENT AND TRADEMARK OFFICE. PATENTS.

Volume: 1179

Issues: 5
PATENTS: 5,461,724-5,463,778

Date: OCTOBER 31, 1995

UMI Number: 10426.00

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of the UNITED STATES PATENT AND TRADEMARK OFFICE

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OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

October 31, 1995 Volume 1179 Number 5

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning PCT member countries, see the notice appearing in the *Official Gazette* at 1178 O.G. 29, on September 12, 1995.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52, on September 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2, on July 7, 1987, and at 1091 O.G. 2, on June 7, 1988. There is no longer a limit on the number of such international applications accepted for international preliminary examination by the European Patent Office; see the notice appearing at 1116 O.G. 32, on July 17, 1990.

The search fee of the European Patent Office was changed, effective June 20, 1995, due to a change in the exchange rate of the U.S. dollar with regard to the German mark, and was announced in the *Official Gazette* at 1174 O.G. 57, on May 9, 1995.

International fees were changed, effective on January 1, 1995, due to a change in the exchange rate of the U.S. dollar with regard to the Swiss franc, and were announced in the *Official Gazette* at 1168 O.G. 99, on November 29, 1994.

Certain domestic PCT fees and charges for International Search and Preliminary Examination were changed, effective October 1, 1995, and were announced in the *Official Gazette* at 1177 O.G. 171, on August 29, 1995.

The schedule of PCT fees (in U.S. dollars), effective October 1, 1995, is as follows:

International Application (PCT Chapter I) fees:

Transmittal fee	220.00
Search Fee	
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA)	
—No corresponding prior U.S. national application filed	660.00
—Corresponding prior U.S. national application filed	430.00
—Supplemental search fee, per additional invention (payable only upon invitation)	190.00
European Patent Office as ISA	1722.00

International fees

Basic fee	604.00
Basic Supplemental fee (for each page over 30)	12.00
Designation fee per country or region	
—For the first 10 national or regional offices designated	147.00
—For each designation in excess of 10 offices	No Charge

Precautionary designation fee and confirmation fee for each precautionary designation confirmed (PCT Rule 15.5)

—Designation fee	147.00
—Confirmation fee	73.50

ternational Application (PCT Chapter II) fees associated with filing a Demand for Preliminary Examination:

Handling fee	185.00
Preliminary examination fee	
USPTO as International Preliminary Examining Authority (IPEA)	
—USPTO was ISA in PCT Chapter I	470.00
—Additional examination fee, per additional invention (payable only upon invitation)	140.00
—USPTO was not ISA in PCT Chapter I	710.00
—Additional examination fee, per additional invention (payable only upon invitation)	250.00

U.S. National Stage Fees	Small Entity	Regular
Basic National fee		
USPTO was IPEA		
—All claims presented satisfied provisions of PCT Article 33(2) to (4)	47.00	94.00
—All claims presented did not satisfy provisions of PCT Article 33(2) to (4)	340.00	680.00
USPTO was ISA but not IPEA	375.00	750.00
USPTO was neither ISA nor IPEA		
—Search report has not been prepared by the European Patent Office or the Japanese Patent Office	505.00	1010.00
—Search report has been prepared by the European Patent Office or the Japanese Patent Office	440.00	880.00
Other National fees		
—For each independent claim in excess of 3	39.00	78.00
—For each claim in excess of 20	11.00	22.00
—For each application containing a multiple dependent claim	125.00	250.00
—Surcharge for filing oath or declaration after the time limit applicable under PCT Article 22 or 39(1)	65.00	130.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(1)	130.00	130.00

Sept. 11, 1995

BRUCE A. LEHMAN
Assistant Secretary of Commerce and
Commissioner of Patents and Trademarks

Notice of Maintenance Fees Payable

Title 37 Code of Federal Regulations (CFR), Section 1.362(d) provides that maintenance fees may be paid without surcharge for the six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(h), as amended effective Dec. 16, 1991. If the maintenance fee is not paid in the patent requiring such payment the patent will expire on the 4th, 8th, or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on October 27, 1992 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 5,157,787 through 5,159,714
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on October 25, 1988 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,779,288 through 4,780,910
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on October 23, 1984 for which maintenance fees due at 11 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,477,927 through 4,479,266
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

For patents based on applications filed on or after Dec. 12, 1980, but before Aug. 27, 1982, patent owners must establish small entity status according to 37 CFR 1.27 if they have not done so and if they wish to pay the small entity amount.

The current amounts of the maintenance fees due at 3 years and six months, 7 years and six months, and 11 years and six months are set forth in 37 CFR 1.20(e)-(g), as amended Oct. 1, 1994, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§ 1.9(f)) $495.00
By other than a small entity....................................$990.00

(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§ 1.9(f)) $995.00
By other than a small entity..................................$1,990.00

(g) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 in force beyond 12 years; the fee is due by eleven years and six months after the original grant:

By a small entity (§ 1.9(f)) $1,495.00
By other than a small entity..................................$2,990.00

The amount of the surcharge for paying the maintenance fee during the grace period or after expiration of the patent are set forth in 37 CFR 1.20(h), and (i) which are reproduced below:

(h) Surcharge for paying a maintenance fee during the 6 month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980:

By a small entity (§ 1.9(f)) $65.00
By other than a small entity....................................$130.00

(i) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been:

(1) unavoidable $660.00
(2) unintentional...$1,550.00

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fee

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED August 23, 1995 DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
Re. 32,409	06/767,525	04/28/87
(4,399,833)	(06/345,660)	(08/23/83)
Re. 33,765	07/394,741	12/10/91
(4,688,116)	(06/858,023)	(08/18/87)
4,399,570	06/321,549	08/23/83
4,399,571	06/275,490	08/23/83
4,399,587	06/247,286	08/23/83
4,399,588	06/288,628	08/23/83
4,399,594	06/289,337	08/23/83
4,399,601	06/402,172	08/23/83
4,399,604	06/331,674	08/23/83
4,399,612	06/276,798	08/23/83
4,399,613	06/356,032	08/23/83
4,399,614	06/256,957	08/23/83
4,399,616	06/309,118	08/23/83
4,399,619	06/263,399	08/23/83
4,399,621	06/306,864	08/23/83
4,399,623	06/273,767	08/23/83
4,399,624	06/270,359	08/23/83
4,399,629	06/240,688	08/23/83
4,399,632	06/271,440	08/23/83
4,399,640	06/271,560	08/23/83
4,399,646	06/302,594	08/23/83
4,399,647	06/289,052	08/23/83
4,399,648	06/276,789	08/23/83
4,399,650	06/324,465	08/23/83
4,399,655	06/301,045	08/23/83
4,399,664	06/327,858	08/23/83
4,399,665	06/327,813	08/23/83
4,399,669	06/242,855	08/23/83
4,399,673	06/320,589	08/23/83
4,399,675	06/316,390	08/23/83
4,399,686	06/231,942	08/23/83
4,399,689	06/240,544	08/23/83
4,399,691	06/286,852	08/23/83
4,399,692	06/224,789	08/23/83
4,399,704	06/270,049	08/23/83
4,399,706	06/409,081	08/23/83
4,399,709	06/237,517	08/23/83
4,399,710	06/292,240	08/23/83
4,399,714	06/319,620	08/23/83
4,399,718	06/267,756	08/23/83
4,399,739	06/217,049	08/23/83
4,399,751	06/322,463	08/23/83
4,399,752	06/263,970	08/23/83
4,399,760	06/314,362	08/23/83
4,399,763	06/263,585	08/23/83
4,399,770	06/360,563	08/23/83
4,399,771	06/293,427	08/23/83
4,399,777	06/293,274	08/23/83
4,399,780	06/314,227	08/23/83
4,399,781	06/229,632	08/23/83
4,399,789	06/232,406	08/23/83
4,399,791	06/294,506	08/23/83
4,399,795	06/284,042	08/23/83

Patent Number	Serial Number	Issue Date
4,399,812	06/336,166	08/23/83
4,399,821	06/236,058	08/23/83
4,399,823	06/308,361	08/23/83
4,399,824	06/308,362	08/23/83
4,399,825	06/270,205	08/23/83
4,399,827	06/264,168	08/23/83
4,399,842	06/358,666	08/23/83
4,399,849	06/281,604	08/23/83
4,399,850	06/231,600	08/23/83
4,399,852	06/316,023	08/23/83
4,399,854	06/273,978	08/23/83
4,399,862	06/293,056	08/23/83
4,399,863	06/332,380	08/23/83
4,399,864	06/329,302	08/23/83
4,399,865	06/284,748	08/23/83
4,399,866	06/253,114	08/23/83
4,399,870	06/313,901	08/23/83
4,399,872	06/340,144	08/23/83
4,399,875	06/372,159	08/23/83
4,399,877	06/255,024	08/23/83
4,399,878	06/293,710	08/23/83
4,399,883	06/257,636	08/23/83
4,399,885	06/265,923	08/23/83
4,399,888	06/251,110	08/23/83
4,399,889	06/239,450	08/23/83
4,399,890	06/265,407	08/23/83
4,399,892	06/300,978	08/23/83
4,399,896	06/277,419	08/23/83
4,399,906	06/227,253	08/23/83
4,399,913	06/264,948	08/23/83
4,399,915	06/311,799	08/23/83
4,399,918	06/239,701	08/23/83
4,399,925	06/369,216	08/23/83
4,399,929	06/286,075	08/23/83
4,399,930	06/317,384	08/23/83
4,399,932	06/269,462	08/23/83
4,399,933	06/287,322	08/23/83
4,399,935	06/233,406	08/23/83
4,399,941	06/253,853	08/23/83
4,399,942	06/319,462	08/23/83
4,399,945	06/221,443	08/23/83
4,399,950	06/269,017	08/23/83
4,399,953	06/322,577	08/23/83
4,399,957	06/326,765	08/23/83
4,399,972	06/253,274	08/23/83
4,399,974	06/329,570	08/23/83
4,399,986	06/330,471	08/23/83
4,399,987	06/279,420	08/23/83
4,399,988	06/324,131	08/23/83
4,399,990	06/305,988	08/23/83
4,399,999	06/366,459	08/23/83
4,400,001	06/278,855	08/23/83
4,400,004	06/294,775	08/23/83
4,400,009	06/270,607	08/23/83
4,400,010	06/247,215	08/23/83
4,400,011	06/244,892	08/23/83
4,400,017	06/272,100	08/23/83
4,400,019	06/256,492	08/23/83
4,400,034	06/232,618	08/23/83
4,400,038	06/290,337	08/23/83
4,400,046	06/243,454	08/23/83
4,400,048	06/309,857	08/23/83
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4,400,058	06/384,842	08/23/83
4,400,059	06/261,033	08/23/83
4,400,063	06/271,284	08/23/83
4,400,067	06/328,603	08/23/83
4,400,069	06/264,620	08/23/83
4,400,074	06/353,031	08/23/83
4,400,078	06/364,654	08/23/83
4,400,080	06/304,469	08/23/83
4,400,083	06/307,499	08/23/83
4,400,085	06/417,694	08/23/83
4,400,089	06/225,541	08/23/83
4,400,090	06/299,571	08/23/83
4,400,101	06/250,117	08/23/83
4,400,107	06/229,684	08/23/83
4,400,118	06/281,869	08/23/83
4,400,122	06/226,280	08/23/83
4,400,125	06/272,952	08/23/83
4,400,131	06/297,597	08/23/83
4,400,135	06/251,148	08/23/83
4,400,136	06/323,666	08/23/83
4,400,139	06/258,242	08/23/83
4,400,140	06/227,415	08/23/83
4,400,142	06/260,498	08/23/83
4,400,143	06/258,477	08/23/83
4,400,154	06/339,859	08/23/83
4,400,155	06/317,026	08/23/83
4,400,156	06/322,236	08/23/83
4,400,158	06/286,071	08/23/83
4,400,159	06/267,608	08/23/83
4,400,168	06/308,773	08/23/83
4,400,173	06/331,508	08/23/83
4,400,175	06/305,567	08/23/83
4,400,179	06/272,417	08/23/83
4,400,180	06/272,419	08/23/83
4,400,183	06/313,662	08/23/83
4,400,185	06/381,383	08/23/83
4,400,187	06/338,913	08/23/83
4,400,190	06/306,066	08/23/83
4,400,197	06/276,309	08/23/83
4,400,198	06/283,704	08/23/83
4,400,202	06/330,630	08/23/83
4,400,203	06/220,925	08/23/83
4,400,204	06/244,453	08/23/83
4,400,220	06/358,843	08/23/83
4,400,221	06/436,869	08/23/83
4,400,228	06/393,959	08/23/83
4,400,233	06/441,229	08/23/83
4,400,234	06/368,795	08/23/83
4,400,239	06/315,601	08/23/83
4,400,242	06/355,139	08/23/83
4,400,247	06/261,336	08/23/83
4,400,251	06/270,612	08/23/83
4,400,255	06/278,049	08/23/83
4,400,261	06/308,724	08/23/83
4,400,262	06/380,096	08/23/83
4,400,264	06/429,778	08/23/83
4,400,267	06/289,530	08/23/83
4,400,271	06/291,902	08/23/83
4,400,272	06/271,501	08/23/83
4,400,274	06/277,146	08/23/83
4,400,276	06/229,229	08/23/83
4,400,280	06/345,394	08/23/83
4,400,282	06/216,140	08/23/83
4,400,289	06/346,331	08/23/83
4,400,291	06/229,754	08/23/83
4,400,293	06/316,382	08/23/83
4,400,298	06/293,072	08/23/83
4,400,303	06/241,975	08/23/83
4,400,306	06/392,961	08/23/83
4,400,307	06/275,001	08/23/83
4,400,309	06/330,540	08/23/83
4,400,312	06/376,074	08/23/83
4,400,318	06/318,189	08/23/83
4,400,322	06/274,288	08/23/83
4,400,324	06/288,825	08/23/83
4,400,331	06/342,544	08/23/83
4,400,349	06/389,484	08/23/83
4,400,352	06/269,006	08/23/83
4,400,355	06/327,931	08/23/83
4,400,356	06/344,897	08/23/83
4,400,363	06/253,652	08/23/83
4,400,364	06/284,155	08/23/83
4,400,373	06/331,456	08/23/83
4,400,375	06/324,241	08/23/83
4,400,377	06/355,252	08/23/83
4,400,383	06/413,078	08/23/83
4,400,386	06/318,930	08/23/83
4,400,392	06/382,175	08/23/83
4,400,401	06/305,281	08/23/83
4,400,403	06/256,323	08/23/83
4,400,412	06/344,860	08/23/83
4,400,413	06/283,091	08/23/83

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4,400,414	06/313,065	08/23/83
4,400,421	06/448,161	08/23/83
4,400,429	06/394,052	08/23/83
4,400,434	06/322,643	08/23/83
4,400,435	06/283,549	08/23/83
4,400,442	06/282,563	08/23/83
4,400,444	06/384,604	08/23/83
4,400,449	06/296,265	08/23/83
4,400,450	06/286,795	08/23/83
4,400,452	06/334,375	08/23/83
4,400,459	06/375,975	08/23/83
4,400,460	06/375,976	08/23/83
4,400,467	06/251,831	08/23/83
4,400,470	06/225,093	08/23/83
4,400,472	06/310,447	08/23/83
4,400,474	06/371,864	08/23/83
4,400,475	06/443,878	08/23/83
4,400,486	06/409,315	08/23/83
4,400,490	06/340,179	08/23/83
4,400,499	06/335,521	08/23/83
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4,687,461	06/862,058	08/18/87
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4,687,483	06/774,823	08/18/87

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4,687,497	06/912,287	08/18/87	4,687,795	06/685,813	08/18/87
4,687,498	06/832,205	08/18/87	4,687,796	06/812,548	08/18/87
4,687,503	06/898,383	08/18/87	4,687,799	06/911,788	08/18/87
4,687,506	06/551,467	08/18/87	4,687,803	06/879,823	08/18/87
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4,687,526	06/817,242	08/18/87	4,687,837	06/840,639	08/18/87
4,687,529	06/863,295	08/18/87	4,687,839	06/812,893	08/18/87
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4,687,579	06/859,166	08/18/87	4,687,877	06/880,033	08/18/87
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4,687,701	06/594,273	08/18/87	4,688,020	06/609,961	08/18/87
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4,687,725	06/791,801	08/18/87	4,688,032	06/879,539	08/18/87
4,687,726	06/731,778	08/18/87	4,688,039	06/788,238	08/18/87
4,687,733	06/575,262	08/18/87	4,688,060	06/826,016	08/18/87
4,687,736	06/666,679	08/18/87	4,688,062	06/833,677	08/18/87
4,687,737	06/751,461	08/18/87	4,688,067	06/583,553	08/18/87
4,687,747	06/626,781	08/18/87	4,688,068	06/834,670	08/18/87
4,687,759	06/808,959	08/18/87	4,688,074	06/808,370	08/18/87
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4,687,763	06/705,174	08/18/87	4,688,083	06/875,610	08/18/87
4,687,769	06/809,168	08/18/87	4,688,095	06/827,155	08/18/87
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4,687,776	06/922,646	08/18/87	4,688,104	06/776,232	08/18/87
4,687,782	06/680,161	08/18/87	4,688,109	06/596,710	08/18/87
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4,688,145	06/727,286	08/18/87
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4,688,163	06/880,790	08/18/87
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4,688,182	06/649,012	08/18/87
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5,041,768	07/336,474	08/20/91
5,041,771	07/549,258	08/20/91
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5,041,790	07/466,021	08/20/91
5,041,791	07/562,550	08/20/91
5,041,805	07/416,660	08/20/91
5,041,810	07/471,920	08/20/91
5,041,811	07/572,137	08/20/91
5,041,816	07/558,562	08/20/91
5,041,818	07/526,003	08/20/91
5,041,819	07/424,345	08/20/91
5,041,832	07/316,593	08/20/91
5,041,863	07/596,017	08/20/91
5,041,865	07/599,985	08/20/91
5,041,867	07/532,969	08/20/91
5,041,874	07/429,962	08/20/91
5,041,876	07/465,620	08/20/91
5,041,881	07/318,981	08/20/91
5,041,889	07/494,221	08/20/91
5,041,908	07/369,466	08/20/91
5,041,927	07/325,648	08/20/91
5,041,951	07/560,208	08/20/91
5,041,954	07/510,668	08/20/91
5,041,960	07/482,315	08/20/91
5,041,976	07/399,683	08/20/91
5,041,987	07/453,189	08/20/91
5,041,992	07/261,770	08/20/91
5,042,017	07/465,344	08/20/91
5,042,030	07/416,810	08/20/91
5,042,033	07/361,415	08/20/91
5,042,045	07/482,922	08/20/91
5,042,055	07/491,741	08/20/91
5,042,057	07/522,159	08/20/91

Patents Reinstated Due to The Acceptance of a Late Maintenance Fee From 08/25/95

Patent Number	Serial Number	Filing Date	Issue Date	Granted Date
4,395,046	06/287,304	07/27/81	07/26/83	08/30/95
4,501,185	06/518,684	07/29/83	02/26/85	08/31/95
4,521,832	06/622,003	06/18/84	06/04/85	08/31/95
4,523,279	06/616,817	06/04/84	06/11/85	08/31/95
4,536,942	06/658,066	10/05/84	08/27/85	08/31/95
4,537,341	06/637,118	08/02/84	08/27/85	08/31/95
4,537,762	06/551,484	11/14/83	08/27/85	08/31/95
4,559,040	06/666,554	10/30/84	12/17/85	08/31/95
4,562,326	06/593,806	03/27/84	12/31/85	08/30/95
4,581,031	06/623,408	06/22/84	04/08/86	08/30/95
4,587,458	06/629,812	07/11/84	05/06/86	08/30/95
4,600,978	06/674,808	11/26/84	07/15/86	08/30/95
4,612,531	06/700,866	02/12/85	09/16/86	08/31/95
4,616,652	06/543,345	10/19/83	10/14/86	08/31/95
4,621,558	06/730,848	05/06/85	11/11/86	08/31/95
4,628,634	06/686,027	12/24/84	12/16/86	08/29/95

Patent Number	Serial Number	Filing Date	Issue Date	Granted Date
4,635,522	06/846,016	03/31/86	01/13/87	08/30/95
4,637,801	06/661,213	10/15/84	01/20/87	08/29/95
4,637,802	06/823,593	01/29/86	01/20/87	08/31/95
4,647,832	06/748,304	06/24/85	03/03/87	08/30/95
4,663,814	06/797,162	11/12/85	05/12/87	08/31/95
4,716,083	06/535,352	09/23/83	12/29/87	08/25/05
4,724,169	06/878,061	06/24/86	02/09/88	08/25/95
4,732,440	06/790,134	10/22/85	03/22/88	08/31/95
4,748,760	07/032,314	03/30/87	06/07/88	08/30/95
4,779,373	07/093,932	09/08/87	10/25/88	08/31/95
4,828,764	07/064,268	06/18/87	05/09/89	08/31/95
4,841,590	07/037,523	04/13/87	06/27/89	08/28/95
4,842,598	07/137,761	12/24/87	06/27/89	08/31/95
4,843,478	07/131,920	12/09/87	06/27/89	08/30/95
4,843,503	07/133,946	12/17/87	06/27/89	08/31/95
4,846,002	07/089,706	08/26/87	07/11/89	08/28/95
4,848,281	07/126,404	11/30/87	07/18/89	08/28/95
4,848,292	07/186,617	04/27/88	07/18/89	08/29/95
4,850,525	07/166,655	03/11/88	07/25/89	08/31/95
4,873,702	07/260,288	10/20/88	10/10/89	08/31/95
4,882,953	07/288,765	12/22/88	11/28/89	08/31/95
4,892,354	07/374,269	06/30/89	01/09/90	08/31/95
4,897,578	07/191,405	05/09/88	01/30/90	08/31/95
4,909,883	07/210,622	06/23/88	03/20/90	08/30/95
4,946,505	07/380,744	07/17/89	08/07/90	08/31/95
4,952,106	07/408,359	09/18/89	08/28/90	08/31/95
4,954,328	06/470,812	01/28/83	09/04/90	08/30/95
4,956,168	06/470,814	01/28/83	09/11/90	08/30/95
4,965,214	07/224,810	07/27/88	10/23/90	08/30/95
4,968,220	07/236,901	08/25/88	11/06/90	08/29/95
4,968,514	06/921,801	10/20/86	11/06/90	08/28/95
4,984,143	07/407,392	09/14/89	01/08/91	08/31/95
4,985,949	07/402,468	09/01/89	01/22/91	08/31/95
4,995,651	07/444,820	12/01/89	02/26/91	08/28/95
4,998,920	07/421,119	10/11/89	03/12/91	08/29/95
5,000,210	07/484,515	02/23/90	03/19/91	08/29/95
5,009,649	07/379,105	07/13/89	04/23/91	08/30/95
5,009,865	06/772,557	09/04/85	04/23/91	08/31/95
5,012,019	07/449,259	01/26/90	04/30/91	08/31/95
5,021,760	07/415,912	10/03/89	06/04/91	08/30/95
5,021,953	07/492,260	03/12/90	06/04/91	08/31/95

Patents Reinstated Due to The Acceptance of a Late Maintenance Fee From 09/01/95

Patent Number	Serial Number	Filing Date	Issue Date	Granted Date
Re. 32,616	06/892,305	08/04/86	03/01/88	09/08/95
4,530,777	06/518,542	07/29/83	07/23/85	09/08/95
4,595,221	06/658,536	10/09/84	06/17/86	09/08/95
4,601,885	06/385,500	06/07/82	07/22/86	09/07/95
4,661,247	06/826,637	02/06/86	04/28/87	09/08/95
4,671,568	06/759,229	07/26/85	06/09/87	09/08/95
4,744,378	06/945,196	12/18/86	05/17/88	09/07/95
4,861,309	07/072,076	07/10/87	08/29/89	09/08/95
4,884,813	07/255,598	10/11/88	12/05/89	09/08/95
4,950,154	07/374,927	07/03/89	08/21/90	09/07/95
4,982,876	07/229,643	08/08/88	01/08/91	09/08/95
4,998,396	07/504,488	04/04/90	03/12/91	09/08/95
5,004,926	07/404,631	09/08/89	04/02/91	09/07/95
5,015,140	07/411,293	09/22/89	05/14/91	09/07/95

Patents Reinstated Due to The Acceptance of a Late Maintenance Fee From 09/08/95

Patent Number	Serial Number	Filing Date	Issue Date	Granted Date
4,388,835	06/289,290	08/03/81	06/21/83	09/13/95
4,508,387	06/537,341	09/29/83	04/02/85	09/11/95
4,568,604	06/567,188	12/30/83	02/04/86	09/14/95
4,585,435	06/615,594	05/31/84	04/29/86	09/14/95
4,721,121	06/829,503	02/14/86	01/26/88	09/11/95

Patent Number	Serial Number	Filing Date	Issue Date	Granted Date
4,823,524	07/071,394	07/09/87	04/25/89	09/14/95
4,846,164	07/083,690	08/07/87	07/11/89	09/13/95
4,895,380	07/157,217	02/17/88	01/23/90	09/11/95
4,987,983	07/380,290	07/17/89	01/29/91	09/14/95
5,026,205	07/456,796	12/29/89	06/25/91	09/13/95

Errata

In the list of patents which expired on July 02, 1995, due to failure to pay maintenance fees, in the O.G. of September 12, 1995, the following patent should not have appeared:

Patent Number	Serial Number	Issue Date	Filing Date
5,028,887	07/502,101	07/02/91	03/29/90

Errata

In the list of patents which expired on July 20, 1994, due to failure to pay maintenance fees, in the O.G. of September 27, 1994, the following patent should not have appeared:

Patent Number	Serial Number	Issue Date	Filing Date
4,340,589	06/237,125	07/20/82	06/18/79

Errata

In the list of patents which expired on July 02, 1995, due to failure to pay maintenance fees, the following numbers should not have appeared, they all are PCT'S not subject to Maintenance fees:

Patent Number	Serial Number	Issue Date	Filing Date
4,392,211	06/243,927	07/05/83	06/24/80
4,392,274	06/247,531	07/12/83	07/04/80
4,377,574	06/272,968	03/22/83	06/26/80

Errata

In the list of patents which expired on June 06, 1993, due to failure to pay maintenance fees, in the O.G. of August 24, 1993, the following patent should not have appeared:

Patent Number	Serial Number	Issue Date	Filing Date
4,836,328	07/042,981	06/06/89	04/27/87

Errata

In the list of patents which expired on June 20, 1993, due to failure to pay maintenance fees, in the O.G. of September 07, 1993, the following patent should not have appeared:

Patent Number	Serial Number	Issue Date	Filing Date
4,841,199	07/151,979	06/20/89	02/03/88

Reissue Applications Filed

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.12(b)).

4,599,285, Re. S.N. 08/526,198, Sept. 11, 1995, Cl. 430, MULTIPLEX IMAGE PRODUCING METHOD, Satoshi Haneda, Owner of Record: *Konishiroku Photo Industry Co., Tokyo, Japan,* Attorney or Agent: Jordan B. Bierman, Ex. Gp.: 1507

4,620,196, Re. S.N. 08/516,524, Aug. 17, 1995, Cl. 346, METHOD AND APPARATUS FOR HIGH RESOLUTION INK JET PRINTING, Carl H. Hertz, Owner of Record: *Inventor,* Attorney or Agent: Toby H. Kusmer, Ex. Gp.: 2108

5,126,055, Re. S.N. 08/516,844, Aug. 18, 1995, Cl. 210/659, PROCESS FOR SEPARATING OPTIC ISOMERS, Akira Yamashita, et. al., Owner of Record: *Daicel Chemical Industries, Ltd., Osaka, Japan,* Attorney or Agent: Terryence F. Chapman, Ex. Gp.: 1306

5,198,429, Re. S.N. 08/526,141, Sept. 5, 1995, Cl. 514, SUBSTITUTED CYCLODEXTRINS AND PROCESS FOR CHROMATOGRAPHIC SEPARATION OF CHIRAL ORGANIC COMPOUNDS, Wilfried Konig, et. al., Owner of Record: *Macherey-Nagel & Co., Duren-Rolsdorf, Germany,* Attorney or Agent: Mark W. Russell, Ex. Gp.: 1815

5,240,857, Re. S.N. 08/524,244, Sept. 6, 1995, Cl. 435/316, TEMPERATURE-GRADIENT INCUBATOR FOR STUDYING TEMPERATURE-DEPENDENT PHENOMENA, Alpo Lahetkangas, Owner of Record: *Biodata OY, Helsinki, Finland,* Attorney or Agent: Brian P. Furrer, Ex. Gp.: 1801

5,244,843, Re. S.N. 08/528,188, Sept. 14, 1995, Cl. 437/239, PROCESS FOR FOMRING A THIN OXIDE LAYER, Robert S. K. Chau, et. al., Owner of Record: *Intel Corp., Santa Clara, Calif.,* Attorney or Agent: Keith G. Askoff, Ex. Gp.: 1104

5,277,615, Re. S.N. 08/518,164, Aug. 23, 1995, Cl. 439/377, APPARATUS FOR REMOVABLY SUPPORTING A PLURALITY OF HOT PLUG-CONNECTED HARD DISK DRIVES, Robert J. Hastings, et. al., Owner of Record: *Compaq Computer Corp., Houston, Tex.,* Attorney or Agent: J. Richard Ronneker, Ex. Gp.: 3202

5,344,493, Re. S.N. 08/521,633, Aug. 31, 1995, Cl. 34/1, CLEANING PROCESS USING MICROWAVE ENERGY AND CENTRIFUGATION IN COMBINATION WITH DENSE FLUIDS, David P. Jackson, Owner of Record: *Inventor,* Attorney or Agent: Janice A. Sharp, Ex. Gp.: 1309

5,349,436, Re. S.N. 08/520,524, Aug. 29, 1995, Cl. 356/246, BIOLOGICAL ASSEMBLY, Harry Fisch, Owner of Record: *Inventor,* Attorney or Agent: Ira J. Schaefer, Ex. Gp.: 2505

5,358,341, Re. S.N. 08/519,211, Aug. 25, 1995, Cl. 384/204, STRUCTURED PRODUCT DYNAMOELECTRIC MACHINE, Harold Blaettner, et. al., Owner of Record: *Inventor,* Attorney or Agent: James H. Beusse, Ex. Gp.: 3503

5,421,192, Re. S.N. 08/519,362, Aug. 25, 1995, Cl. 73/40.7, LEAK DETECTION IN HEATING VENTILATING AND AIR CONDITIONING SYSTEMS USING AN ENVIRON-

MENTALLY SAFE MATERIAL, Richard G. Henry, Owner of Record: *Bright Solutions, Inc., Bloomfield Hills, Mich.*, Attorney or Agent: Robert J. Black, Ex. Gp.: 2212

5,422,654, Re. S.N. 08/520,528, Aug. 29, 1995, Cl. 348/103, DATA STREAM CONVERTER WITH INCREASED GREY LEVELS, Ignatius B. Tjandrasuwita, et. al., Owner of Record: *Chips and Technologies, Inc., San Jose, Calif.* Attorney or Agent: Joseph A. Sawyer, Jr., Ex. Gp.: 2615

Requests for Reexaminations Filed

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

4,366,382, Reexam. No. 90/003,947, Sept. 11, 1995, Cl. 378/057, X-RAY LINE SCAN SYSTEM FOR USE IN BAGGAGE INSPECTION, Andreas Kotowski, Owner of Record: *Scanray Corp., Harbor City, Calif.*, Attorney or Agent: Robert Cogan, EG & G, Inc., Wellsley, Mass., Ex. Gp.: 2506, Requester: Fish & Richardson, Washington, D.C.

4,408,150, Reexam. No. 90/003,948, Sept. 11, 1995, Cl. 318/779, SPEED CONTROL SYSTEM AND METHOD FOR ELECTRIC MOTOR, Roger W. Holston, et. al., Owner of Record: *Hunter-Melnor, Inc., Chicago, Ill.*, Attorney or Agent: James V. Callahan, Allegretti & Witcoff, Chicago, Ill., Ex. Gp.: 2107, Requester: Albert M. Crowder, Jr., Boise, Id.

4,674,686, Reexam. No. 90/003,949, Sept. 11, 1995, Cl. 239/279, PORTABLE FIRE APPARATUS MONITOR, James M. Trapp, Owner of Record: *Elkhart Brass Manufacturing Co., Inc., Elkhart, Ind.*, Attorney or Agent: James D. Hall, Baker & Daniels, South Bend, Ind., Ex. Gp.: 3104, Requester: Task Force Tips, Inc., Valparaiso, Ind., c/o Jeffry W. Smith, Marshall, O'Toole, Gerstein, Murray & Borun, Chicago, Ill.

4,888,473, Reexam. No. 90/003,942, Aug. 14, 1995, Cl. 235/376, WAFER DISK LOCATION MONITORING SYSTEM AND TAGGED PROCESS CARRIER FOR USE THEREWITH, Alexander N. Rossi, et. al., Owner of Record: *Fluoroware, Inc., Chaska, Minn.*, Attorney or Agent: Nelson R. Capes, Palmatier Sjoquist & Helget, Minneapolis, Minn., Ex. Gp.: 2514, Requester: Owner

5,355,872, Reexam. No. 90/003,943, Aug. 23, 1995, Cl. 128/200.21, LOW FLOW RATE NEBULIZER APPARATUS AND METHOD OF NEBULIZATION, John H. Riggs, et. al., Owner of Record: *John H. Riggs, Cary, N.C.; Barry O. Mangum, Raleigh, N.C.*, Attorney or Agent: Steven J. Hultquist, Research Triangle Park, N.C., Ex. Gp.: 3307, Requester: Vortran Medical Technology, Inc., Sacramento, Calif.; John P. O'Banion, Gerber Ritchey & O'Banion, Carmichael, Calif.

5,407,668, Reexam. No. 90/003,944, Aug. 30, 1995, Cl. 424/065, CLEAR DEODORANT STICK COMPOSITIONS, David M. Kellner, Owner of Record: *Revlon Consumer Products Corp., New York, N.Y.*, Attorney or Agent: Julie Blackburn, New York, N.Y., Ex. Gp.: 1203, Requester: Application Chemicals Inc., Glen Rock, N.J., c/o Michael E. Zall, Weingram & Zall, Maywood, N.J.

5,409,864, Reexam. No. 90/003,945, Aug. 31, 1995, Cl. 437/209, SUBSTRATE FOR SEMICONDUCTOR APPARATUS, Mituo Osada, et. al., Owner of Record: *Sumitomo Electric Industries Ltd., Osaka, Japan*, Attorney or Agent: David Blumenthal, Foley & Lardner, Washington, D.C., Ex. Gp.: 1104, Requester: Elizabeth A. Levy, Lappin & Kusmer, Boston, Mass.

5,421,130, Reexam. No. 90/003,946, Sept. 1, 1995, Cl. 052/208, HOLDING ELEMENT FOR A GLASS PANE IN THE FRAME OF A MOTOR VEHICLE, Eduard-Johann Weber, et. al., Owner of Record: *General Motors Co., Detroit, Mich.*, Attorney or Agent: Ernest E. Helms, General Motors Co., Detroit, Mich., Ex. Gp.: 3504, Requester: Owner

Notice of Expiration of Trademark Registrations Due To Failure to Renew

15 U.S.C. 1059 provides that each trademark registration may be renewed for periods of ten years from the end of the expiring period upon payment of the prescribed fee and the filing of an acceptable application for renewal. This may be done at any time within six months before the expiration of the period for which the registration was issued or renewed, or it may be done within three months after such expiration on payment of an additional fee.

According to the records of the Office, the trademark registrations listed below are expired due to failure to renew in accordance with 15 U.S.C. 1059.

TRADEMARK REGISTRATIONS WHICH EXPIRED AUGUST 07, 1995 DUE TO FAILURE TO RENEW

Reg. Number	Serial Number	Reg. Date
101,001	71/079,861	11/03/1914
101,020	71/079,650	11/03/1914
318,507	71/327,981	10/30/1934
318,522	71/349,809	10/30/1934
318,523	71/349,811	10/30/1934
318,527	71/351,183	10/30/1934
318,529	71/351,373	10/30/1934
318,533	71/352,055	10/30/1934
318,534	71/352,065	10/30/1934
318,536	71/352,109	10/30/1934
318,539	71/352,144	10/30/1934
318,546	71/352,209	10/30/1934
318,552	71/350,555	10/30/1934
318,568	71/351,749	10/30/1934
318,602	71/354,263	10/30/1934
318,612	71/353,391	10/30/1934
318,625	71/353,851	10/30/1934
318,628	71/353,834	10/30/1934
318,727	71/346,174	10/30/1934
318,728	71/346,173	10/30/1934
318,732	71/346,565	10/30/1934
593,081	71/646,050	07/27/1954
597,503	71/659,574	11/02/1954
597,505	71/635,374	11/02/1954
597,506	71/636,427	11/02/1954
597,507	71/639,242	11/02/1954
597,521	71/646,974	11/02/1954
597,523	71/657,731	11/02/1954
597,533	71/654,113	11/02/1954
597,536	71/641,710	11/02/1954
597,540	71/654,063	11/02/1954
597,541	71/656,012	11/02/1954
597,544	71/659,245	11/02/1954
597,545	71/660,029	11/02/1954
597,548	71/663,218	11/02/1954
597,549	71/663,449	11/02/1954
597,561	71/642,214	11/02/1954
597,562	71/642,216	11/02/1954
597,564	71/643,358	11/02/1954
597,576	71/658,639	11/02/1954
597,592	71/637,269	11/02/1954
597,597	71/652,991	11/02/1954
597,602	71/658,187	11/02/1954
597,603	71/658,615	11/02/1954
597,606	71/656,619	11/02/1954
597,608	71/657,329	11/02/1954
597,610	71/657,416	11/02/1954
597,612	71/658,108	11/02/1954

Reg. Number	Serial Number	Reg. Date			
597,615	71/658,819	11/02/1954	996,841	73/010,345	10/29/1974
597,622	71/652,266	11/02/1954	996,842	73/010,426	10/29/1974
597,623	71/628,254	11/02/1954	996,843	73/011,299	10/29/1974
597,631	71/646,898	11/02/1954	996,844	73/012,478	10/29/1974
597,633	71/652,013	11/02/1954	996,845	73/013,091	10/29/1974
597,638	71/655,135	11/02/1954	996,850	73/013,129	10/29/1974
597,652	71/660,596	11/02/1954	996,854	73/013,808	10/29/1974
597,653	71/661,685	11/02/1954	996,858	73/014,220	10/29/1974
597,655	71/612,242	11/02/1954	996,860	73/014,379	10/29/1974
597,656	71/634,317	11/02/1954	996,862	73/015,626	10/29/1974
597,670	71/660,863	11/02/1954	996,865	73/001,838	10/29/1974
597,679	71/657,741	11/02/1954	996,867	73/005,501	10/29/1974
597,680	71/657,742	11/02/1954	996,869	73/005,579	10/29/1974
597,696	71/646,243	11/02/1954	996,873	73/009,183	10/29/1974
597,701	71/643,955	11/02/1954	996,884	73/012,881	10/29/1974
597,703	71/657,299	11/02/1954	996,885	73/012,896	10/29/1974
597,704	71/657,379	11/02/1954	996,897	73/012,144	10/29/1974
597,714	71/655,348	11/02/1954	996,902	73/000,890	10/29/1974
597,727	71/651,642	11/02/1954	996,907	73/001,193	10/29/1974
597,733	71/663,010	11/02/1954	996,910	73/001,953	10/29/1974
597,746	71/638,775	11/02/1954	996,919	73/011,180	10/29/1974
597,758	71/657,636	11/02/1954	996,921	72/451,641	10/29/1974
597,764	71/626,798	11/02/1954	996,925	72/464,335	10/29/1974
597,767	71/651,004	11/02/1954	996,929	72/460,820	10/29/1974
597,768	71/662,561	11/02/1954	996,933	72/448,818	10/29/1974
978,773	72/420,305	02/12/1974	996,936	72/460,171	10/29/1974
987,158	72/435,423	07/02/1974	996,937	72/465,605	10/29/1974
994,473	72/453,747	10/01/1974	996,943	72/459,034	10/29/1974
996,683	73/006,813	10/29/1974	996,949	72/453,456	10/29/1974
996,684	73/000,216	10/29/1974	996,950	72/459,732	10/29/1974
996,688	73/006,842	10/29/1974	996,951	72/460,565	10/29/1974
996,689	73/000,115	10/29/1974	996,957	72/466,275	10/29/1974
996,690	73/008,065	10/29/1974	996,958	72/466,766	10/29/1974
996,691	73/003,394	10/29/1974	996,969	72/464,548	10/29/1974
996,692	73/004,242	10/29/1974	996,970	72/464,765	10/29/1974
996,693	73/004,756	10/29/1974	996,980	72/431,442	10/29/1974
996,694	73/007,879	10/29/1974	996,982	72/444,405	10/29/1974
996,697	73/000,394	10/29/1974	996,985	72/447,240	10/29/1974
996,698	73/000,401	10/29/1974	996,990	72/455,448	10/29/1974
996,699	73/002,777	10/29/1974	996,991	72/455,449	10/29/1974
996,703	73/006,968	10/29/1974	996,992	72/455,914	10/29/1974
996,707	73/013,276	10/29/1974	996,993	72/457,135	10/29/1974
996,709	73/013,337	10/29/1974	996,994	72/457,474	10/29/1974
996,713	73/013,706	10/29/1974	996,995	72/459,264	10/29/1974
996,716	73/013,709	10/29/1974	996,997	72/459,790	10/29/1974
996,721	73/021,021	10/29/1974	997,000	72/460,679	10/29/1974
996,722	73/021,435	10/29/1974	997,003	72/461,502	10/29/1974
996,723	73/000,631	10/29/1974	997,004	72/461,580	10/29/1974
996,727	73/011,518	10/29/1974	997,008	72/467,141	10/29/1974
996,728	73/000,082	10/29/1974	997,009	72/425,845	10/29/1974
996,729	73/004,740	10/29/1974	997,012	72/439,569	10/29/1974
996,731	73/006,231	10/29/1974	997,015	72/451,746	10/29/1974
996,735	73/009,615	10/29/1974	997,017	72/455,904	10/29/1974
996,739	73/003,455	10/29/1974	997,021	72/461,506	10/29/1974
996,741	73/002,338	10/29/1974	997,022	72/462,630	10/29/1974
996,760	73/002,344	10/29/1974	997,024	72/411,271	10/29/1974
996,771	73/014,981	10/29/1974	997,025	72/408,295	10/29/1974
996,777	73/017,960	10/29/1974	997,026	72/441,355	10/29/1974
996,778	73/000,679	10/29/1974	997,030	72/457,023	10/29/1974
996,787	73/000,766	10/29/1974	997,031	72/457,026	10/29/1974
996,789	73/000,972	10/29/1974	997,032	72/464,360	10/29/1974
996,795	73/012,002	10/29/1974	997,035	72/438,954	10/29/1974
996,796	73/012,267	10/29/1974	997,036	72/456,926	10/29/1974
996,801	73/021,383	10/29/1974	997,038	72/450,182	10/29/1974
996,802	73/010,290	10/29/1974	997,039	72/458,331	10/29/1974
996,806	73/006,069	10/29/1974	997,040	72/466,399	10/29/1974
996,808	73/003,855	10/29/1974	997,042	72/441,199	10/29/1974
996,814	73/011,507	10/29/1974	997,043	72/446,847	10/29/1974
996,815	73/012,600	10/29/1974	997,048	72/447,741	10/29/1974
996,818	73/001,212	10/29/1974	997,052	72/453,939	10/29/1974
996,821	73/003,837	10/29/1974	997,054	72/454,247	10/29/1974
996,826	73/004,787	10/29/1974	997,057	72/419,223	10/29/1974
996,829	73/006,137	10/29/1974	997,061	72/431,198	10/29/1974
996,832	73/007,125	10/29/1974	997,062	72/432,403	10/29/1974
996,833	73/007,443	10/29/1974	997,072	72/458,514	10/29/1974
996,836	73/008,418	10/29/1974	997,077	72/461,442	10/29/1974
996,838	73/008,753	10/29/1974	997,079	72/462,876	10/29/1974
			997,084	72/442,062	10/29/1974
			997,086	72/443,920	10/29/1974

Reg. Number	Serial Number	Reg. Date
997,088	72/454,193	10/29/1974
997,089	72/455,035	10/29/1974
997,091	72/463,293	10/29/1974
997,092	72/465,804	10/29/1974
997,093	72/465,806	10/29/1974
997,094	72/466,081	10/29/1974
997,097	72/418,094	10/29/1974
997,098	72/426,603	10/29/1974
997,102	72/464,571	10/29/1974
997,103	72/464,577	10/29/1974
997,105	72/434,716	10/29/1974
997,110	72/462,332	10/29/1974
997,111	72/463,058	10/29/1974
997,114	72/465,794	10/29/1974
997,116	72/465,477	10/29/1974
997,119	72/463,671	10/29/1974
997,120	72/446,284	10/29/1974
997,121	72/464,454	10/29/1974
997,122	72/461,778	10/29/1974
997,124	72/461,780	10/29/1974
997,129	72/450,149	10/29/1974
997,131	72/452,948	10/29/1974
997,132	72/453,345	10/29/1974
997,136	72/461,246	10/29/1974
997,139	72/403,085	10/29/1974
997,141	72/436,238	10/29/1974
997,142	72/436,239	10/29/1974
997,144	72/438,206	10/29/1974
997,154	72/460,180	10/29/1974
997,158	72/464,607	10/29/1974
997,160	72/452,369	10/29/1974
997,163	72/462,358	10/29/1974
997,167	72/453,053	10/29/1974
997,169	72/456,259	10/29/1974
997,171	72/461,844	10/29/1974
997,173	72/453,023	10/29/1974
997,175	72/420,706	10/29/1974

Service by Publication

A petition to cancel the registrations identified below having been filed, and the notice of such proceeding sent by certified mail to registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrants listed herein, their assigns or legal representatives, shall enter an appearance within thirty days of this publication, the cancellation will proceed as in the case of default.

Bruce Berg, Pipersville, Pa., Reg. No. 1,048,718, for the mark "ROADHOUSE", Canc. No. 23,996.

Peter Vendetti, Cranbury, N.J., Reg. No. 1,559,119, for the mark "IT'S BOSS", Canc. No. 23,997.

Pier 25, Inc., Philadelphia, Pa., Reg. No. 1,707,468 for the mark "AMAZON VILLAGE", Canc. No. 23,798.

Smooth Moves, Raleigh, N.C., Reg. No. 1,582,868 for the mark "SMOOTH MOVES", Canc. No. 23,535.

Half Caff Coffee, Concord, Calif., Reg. No. 1,699,276 for the mark "HAVA JAVA", Canc. No. 23,692.

Atrium Publishing Corporation, Elmont, N.Y. Reg. No. 1,061,656 for the mark "PLANNING AHEAD", Canc. No. 23,843.

JEAN BROWN
Technical Support Manager,
Trademark Trial
and Appeal Board, for
ROBERT M. ANDERSON
Deputy Assistant Commissioner
for Trademarks

Errata

"All reference to Patent No. 5,435,300 to Kevin K. Brunson of Texas for DISPOSABLE AEROSOL MASK WITH FACE SHIELD appearing in the *Official Gazette* of July 25, 1995 should be deleted since no patent was granted."

"All reference to Patent No. 5,451,855 to Kazutoshi Tani, et. al. of Japan for WASHING MACHINE MOTOR CONTROLLER WITH OVERCURRENT PROTECTION appearing in the *Official Gazette* of September 19, 1995 should be deleted since no patent was granted."

Department of Commerce
Patent and Trademark Office

Interim Guidelines for Examination of Design Patent Applications For Computer-Generated Icons

RIN: 0651-XX04
[Docket No. 950921236-5236-01]

Agency: Patent and Trademark Office, Commerce.
Action: Notice and request for public comments.
Summary: The Patent and Trademark Office (PTO) requests comments from any interested member of the public on interim guidelines that will be used by PTO personnel in their review of design patent applications for computer-generated icons. Because these guidelines govern internal practices, they are exempt from notice and comment rulemaking under 5 U.S.C. 553(b)(A).
Dates: Effective Date October 5, 1995.

Written comments on the interim guidelines will be accepted by the PTO until November 6, 1995.

Written comments will be available for public inspection on November 21, 1995, in Room 8D19 of Crystal Plaza 3, 2021 Jefferson Davis Highway, Arlington, Virginia. In addition, comments provided in machine-readable format will be available through anonymous file transfer protocol (ftp) via the Internet (address: comments.uspto.gov) and through the World Wide Web (address: www.uspto.gov).

Addresses: Written comments should be addressed to the Assistant Commissioner for Patents, Washington, D.C. 20231, marked to the attention of John Kittle, Director, Group 1100/2900, Crystal Plaza 3, 8D19. Comments may also be submitted by telefax at (703) 305-3600 or by electronic mail through the INTERNET to "icon-pat@uspto.gov."
For Further Information Contact: John Kittle by telephone at (703) 308-1495 or by mail to his attention addressed to the Assistant Commissioner for Patents, Group 1100/2900, Washington, D.C. 20231.
Supplementary Information: Written comments should include the following information:

—Name and affiliation of the individual responding;
—An indication of whether the comments offered represent views of the respondent's organization or are the respondent's personal views; and
—If applicable, information on the respondent's organization, including the type of organization and general areas of interest.

Parties presenting written comments are requested, where possible, to provide their comments in machine-readable format. Such submissions may be provided by electronic mail messages sent over the Internet, or on a 3.5" floppy disk formatted for use in either a Macintosh or MS-DOS based computer. Machine-readable submissions should be provided as unformatted text (e.g., ASCII or plain text).

Sept. 29, 1995

LAWRENCE J. GOFFNEY, JR.
Acting Assistant Secretary of Commerce
and Acting Commissioner of Patents
and Trademarks

I. INTERIM GUIDELINES FOR EXAMINATION OF DESIGN PATENT APPLICATIONS FOR COMPUTER-GENERATED ICONS

The following guidelines have been primarily developed to assist PTO personnel in determining whether design patent applications for computer-generated icons comply with the "article of manufacture" requirement of 35 U.S.C. 171.[1]

A. General Principle Governing Compliance with the "Article of Manufacture" Requirement

A design for a computer-generated icon[2] which is embodied in an article of manufacture is statutory subject matter for a design patent under Section 171. Thus, if an application claims a computer-generated icon embodied in a computer screen, monitor, other display panel, or a portion thereof,[3] that is drawn in solid lines,[4] the claim complies with the "article of manufacture" requirement of Section 171.

B. Procedures for Evaluating Whether Design Patent Applications Drawn to Computer-Generated Icons Comply With the "Article of Manufacture" Requirement

PTO personnel shall adhere to the following procedures when reviewing design patent applications drawn to computer-generated icons for compliance with the "article of manufacture" requirement of Section 171.

1. Read the entire disclosure to determine what the applicant claims as the design,[5] and to determine whether the design is embodied in an article of manufacture. 37 CFR 1.71 and 1.152-54.

a. Review the drawing to determine whether a computer screen, monitor, other display panel, or portion thereof, is depicted in solid lines. 37 CFR 1.152.

b. Review the title to determine whether it clearly describes the claimed subject matter.[6] 37 CFR 1.153.

c. Review the specification to determine whether a characteristic feature statement is present. 37 CFR 1.71. If a characteristic feature statement is present, determine whether it describes the claimed subject matter as a computer-generated icon embodied in a computer screen, monitor, other display panel, or portion thereof.[7]

2. If the drawing does *not* depict a computer-generated icon embodied in a computer screen, monitor, or a portion thereof, in solid lines, reject the claimed design under Section 171 and 35 U.S.C. 112, second paragraph, for failing to: (i) comply with the article of manufacture requirement; and (ii) particularly point out and distinctly claim the subject matter which the applicant regards as the invention.[8]

a. If the disclosure as a whole does *not* suggest or describe[9] the claimed subject matter as a computer-generated icon embodied in a computer screen, monitor, other display panel, or portion thereof, indicate that: (i) the claim is defective under Sections 171 and 112, second paragraph; and (ii) amendments to the written description, drawings and/or claim attempting to overcome the rejections will be rejected under 35 U.S.C. 112, first paragraph, for lack of written description and changes to the written description and drawings will be disapproved under 35 U.S.C. 132 as constituting new matter.

b. If the disclosure as a whole suggests or describes the claimed subject matter as a computer-generated icon embodied in a computer screen, monitor, other display panel, or portion thereof, indicate that the drawing may be amended to overcome the rejections under Sections 171 and 112, second paragraph. Suggest amendments which would bring the claim into compliance with Sections 171 and 112, second paragraph.

3. Indicate all objections to the disclosure for failure to comply with the formal requirements of the Rules of Practice in Patent Cases. 37 CFR 1.71, 1.81-85, and 1.152-154. Suggest amendments which would bring the disclosure into compliance with the formal requirements of the Rules of Practice in Patent Cases.

4. Upon response by applicant:

a. Review applicant's arguments and any amendments;

b. Approve entry of any amendments which have support in the original disclosure;

c. Review all arguments and evidence of record to determine whether the drawing, title, and specification clearly disclose a computer-generated icon embodied in a computer screen, monitor, other display panel, or portion thereof.

5. If a preponderance of the evidence[10] establishes that the computer-generated icon is embodied in a computer screen, monitor, other display panel, or portion thereof, withdraw the rejection under Sections 171 and 112, second paragraph.

II. Effect of the Interim Guidelines on Pending Design Applications Drawn to Computer-Generated Icons

PTO personnel shall follow the procedures set forth in Section I of these Interim Guidelines when examining design patent applications drawn to computer-generated icons which are pending in the PTO as of the date of publication of these Interim Guidelines in the Federal Register.

III. Treatment of Type Fonts

Traditionally, type fonts were generated by solid blocks from which each letter or symbol was produced. Consequently, the PTO has historically granted design patents drawn to type fonts. PTO personnel should not reject claims for type fonts under Section 171 for failure to comply with the "article of manufacture" requirement on the basis that more modern methods of typesetting, including computer-generation, do not require solid printing blocks. However, PTO personnel should treat applications specifically drawn to computer-generated type fonts in accordance with the procedures set forth in Section I of these Interim Guidelines.

IV. Notes

1. Further procedures for search and examination of design patent applications to ensure compliance with all other conditions of patentability are found in the Manual of Patent Examining Procedure, Chapter 1500.

2. Computer-generated icons, such as full screen displays and individual icons, are two-dimensional images which alone are surface ornamentation. *See, e.g., Ex parte Strijland*, 26 USPQ2d 1259, 1262 (Bd. Pat App. & Int. 1992) (computer-generated icon alone is merely surface ornamentation).

3. Since a patentable "design is inseparable from the object to which it is applied and cannot exist alone merely as a scheme of surface ornamentation," a computer-generated icon must be embodied in a computer screen, monitor, other display panel, or portion thereof, to satisfy Section 171. MPEP 1502.

4. *Strijland* indicated that a computer-generated icon might be statutory subject matter if the solid-line icon is displayed on a computer screen which is shown as a broken-line drawing. 26 USPQ2d at 1263, 1266. However, since broken lines may be used to show visible environmental structure and not claimed subject matter, representation of a computer screen, monitor, other display panel, or portion thereof, in broken lines does not satisfy Section 171. *See, e.g., In re Zahn*, 617 F.2d 261, 268, 204 USPQ 988, 995 (CCPA 1980) (broken lines in design drawing show environmental structure, not claim). Broken lines may, however, be used to show other environmental structure, such as a central processing unit which contains equipment to operate the computer screen, monitor, or other display panel.

5. Since the claim must be in formal terms to the design "as shown, or as shown and described," the drawing provides the best description of the claim. 37 CFR 1.153.

6. The following titles do not adequately describe a design for an article of manufacture under Section 171: "computer icon;" or "icon." On the other hand, the following titles do adequately describe a design for an article of manufacture under Section

171: "computer screen with an icon;" "display panel with a computer icon;" "portion of a computer screen with an icon image;" "portion of a display panel with a computer icon image;" or "portion of a monitor displayed with a computer icon image."

7. *See McGrady v. Aspenglas Corp.*, 487 F. Supp. 859, 861, 208 USPQ 242, 244 (S.D.N.Y. 1980) (descriptive statement in design patent application narrows claim scope).

8. A computer screen, monitor, or other display panel is clearly described by showing a larger surface area than that immediately behind the icon image.

9. A broken line drawing of a computer screen shown in the original disclosure suggests that the applicant originally had possession of the invention as embodied in an article of manufacture. Accordingly, the broken line drawing may be converted to a solid line drawing without violating the prohibition against new matter. *See In re Rasmussen*, 650 F.2d 1212, 1214, 211 USPQ 323, 326 (CCPA 1981) (An applicant is entitled to claims as broad as the original disclosure will allow). However, a solid line drawing of a computer screen in the original disclosure may not be amended to a solid line drawing of *only a portion* of the computer screen without support in the original disclosure for such an amendment. *See, e.g., Ballew v. Watson*, 290 F.2d 353, 355, 129 USPQ 48, 50 (Comm'r Pat. 1961) (an amendment to the claim which changes the appearance of the original disclosure and would "create newness by the difference achieved" is new matter).

10. *See In re Oetiker*, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992) ("After evidence or argument is submitted by the applicant in response, patentability is determined on the totality of the record, by a preponderance of evidence with due consideration to persuasiveness of argument.").

Certificate Of Correction
For Week of October 31, 1995

P. 8,204
P. 9,052
P. 9,211
Re. 34,721
D. 325,819
D. 348,880
D. 356,067
D. 360,473
D. 360,757
D. 360,974
B1 4,473,722
4,679,266
4,897,255
4,919,414
4,965,392
4,981,979
4,982,277
4,992,980
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5,017,693
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Box AF	Expedited procedure for processing amendments and other responses after final rejection.
Box DAC	Petitions decided by the Office of Petitions including petitions to revive and petitions to accept late payment of issue fees or maintenance fees.
Box DD	Disclosure Documents or material related to the Disclosure Document Program.
Box FWC	Requests for File Wrapper Continuation Applications (under 37 CFR 1.62).
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Box Issue Fee	All communications following the receipt of a PTOL–85, "Notice of Allowance and Issue Fee Due," and prior to the issuance of a patent should be addressed to Box Issue Fee, unless advised to the contrary. Assignments are the exception. Assignments should be submitted in a separate envelope and not be sent to Box Issue Fee.
Box M Fee	Correspondence related to a patent that is subject to the payment of a maintenance fee.
Box MPEP	Submissions concerning the Manual of Patent Examining Procedures.
Box Non-Fee-Amendment	Non-fee amendments to patent applications. (Use Box AF for responses after final rejection).
Box PATENT APPLICATION	New patent application and associated papers and fees.
Box Pat. Ext.	Applications for patent term extension.
Box PCT	Mail related to applications filed under the Patent Cooperation Treaty.
Box Provisional Patent Application	The filings of all provisional patent applications and any communications relating thereto.
Box Reconstruction	Correspondence pertaining to the reconstruction of lost patent files.
Box Reexam	Requests for Reexamination for *original* request papers *only*.
Box Sequence	Submission of diskette for biotechnical application.
Box SN	For fee and petitions under 37 CFR 1.182 to obtain date received and/or serial number for patent applications *prior* to the Office's standard notification (return postcard or the official "Filing Receipt," "Notice to File Missing Parts," or "Notice of Incomplete Application").

SPECIAL BOXES FOR TRADEMARK MAIL

Special box designations should be used to allow forwarding of particular types of trademark mail to the appropriate areas as quickly as possible. In addition to these box designations, filers are encouraged to indicate whether the contents of the envelope contain a fee. Envelopes containing a fee should be marked "FEE;" envelopes not containing a fee should be marked "NO FEE." Box designations and "FEE/NO FEE" indicators should appear on the envelope as well as on the cover sheet or first page of any document.

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Assistant Commissioner for Trademarks
2900 Crystal Drive
Arlington, Virginia 22202-3513

Box Designations	Explanation
Box NEW APP FEE	New trademark applications and fees.
Box ITU FEE	Statements of Use (SOU's), and extension requests.
Box TTAB FEE	Oppositions, Cancellation petitions, and ex parte appeals.
Box TTAB NO FEE	Interferences, motions and extension requests.
Box STATUS NO FEE	Written status inquiries.
Box POST REG FEE	Affidavits, renewals, corrections, and amendments.
Box RESPONSES NO FEE	Responses to Examining Attorneys' Office actions and Post Registration actions.

SPECIAL BOXES APPLICABLE TO *BOTH* PATENT AND TRADEMARK MAIL

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Box Designations	Explanation
Box 3	Mail for the Office of Personnel from NFC.
Box 4	Mail for the Assistant Commissioner for External Affairs and the Office of Legislative and International Affairs.
Box 6	Mail for the Office of Procurement.
Box 8	All papers for the Office of the Solicitor *except* communications relating to *pending litigation*; papers relating to pending litigation shall be mailed only to the Office of the Solicitor, P.O. Box 15667, Arlington, Virginia 22215 and papers relating to pending disciplinary proceedings before the Administrative Law Judge or the Commissioner shall be mailed only to the Office of the Solicitor, P.O. Box 16116, Arlington, Virginia 22215.
Box 9	Coupon orders for U.S. patent and trademark copies.
Box 10	Orders for certified copies of PTO documents.
Box 11	Electronic Ordering Service (EOS).
Box 13	Mail for the Employee and Labor Relations Division.
Box 14	Mail directed to the APS Contracts Office.
Box 16	Deposit Account Replenishment Checks.
Box 17	Invoices directed to the Office of Finance.
Box 171	Vacancy Announcement Applications.
Box Assignment	All assignment documents except those filed with new applications.
Box EEO	Mail for the Office of Civil Rights.
Box OED	Mail for the Office of Enrollment and Discipline.

Reference Collections of U.S. Patents and Trademarks Available for Public Use in Patent and Trademark Depository Libraries

The following libraries, designated as Patent and Trademark Depository Libraries (PTDLs), receive patent and trademark information in various formats from the U.S. Patent and Trademark Office. Many PTDLs have on file all full-text patents issued since 1790, trademarks published since 1872, and select collections of foreign patents. All PTDLs have both the patent and trademark sections of the *Official Gazette of the U.S. Patent and Trademark Office*. The full-text utility and design patents are distributed numerically on 16 mm microfilm, and plant patents on color microfiche. Patent and trademark search systems on CD-ROM (Compact Disc-Read Only) format are available at all PTDLs to increase utilization of and enhance access to the information found in patents and trademarks. It is through the CD-ROM systems that preliminary patent and trademark searches can be conducted through the numerically arranged collections.

All information is available for use by the public free of charge.

In addition, each PTDL offers reference publications which outline and provide access to the patent and trademark classification systems, as well as other documents and publications which supplement the basic search tools. PTDLs provide technical staff assistance in using all materials. Facilities for making paper copies of patent and trademark information are generally provided for a fee.

Since there are variations in the scope of patent and trademark collections among the PTDLs, and their hours of service to the public vary, anyone contemplating use of these collections at a particular library is urged to contact that library in advance about its collections, services, and hours in order to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 844-1747
	Birmingham Public Library	(205) 226-3620
Alaska	Anchorage: Z.J. Loussac Public Library	(907) 562-7323
Arizona	Tempe: Noble Library, Arizona State University	(602) 965-7010
Arkansas	Little Rock: Arkansas State Library	(501) 682-2053
California	Los Angeles Public Library	(213) 228-7220
	Sacramento: California State Library	(916) 654-0069
	San Diego Public Library	(619) 236-5813
	San Francisco Public Library	(415) 557-4488
	Sunnyvale Patent Clearinghouse	(408) 730-7290
Colorado	Denver Public Library	(303) 640-6249
Connecticut	New Haven: Science Park Library	(203) 786-5447
Delaware	Newark: University of Delaware Library	(302) 831-2965
Dist. of Columbia	Washington: Howard University Libraries	(202) 806-7252
Florida	Fort Lauderdale: Broward County Main Library	(305) 357-7444
	Miami-Dade Public Library	(305) 375-2665
	Orlando: University of Central Florida Libraries	(407) 823-2562
	Tampa Campus Library, University of South Florida	(813) 974-2726
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Hawaii	Honolulu: Hawaii State Public Library System	(808) 586-3477
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 747-4450
	Springfield: Illinois State Library	(217) 782-5659
Indiana	Indianapolis-Marion County Public Library	(317) 269-1741
	West Lafayette Siegesmund Engineering Library, Purdue University	(317) 494-2872
Iowa	Des Moines: State Library of Iowa	(515) 281-4118
Kansas	Wichita: Ablah Library, Wichita State University	(316) 689-3155
Kentucky	Louisville Free Public Library	(502) 574-1611
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Maine	Orono: Raymond H. Fogler Library, University of Maine	(207) 581-1678
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 405-9157
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Library, University of Michigan	(313) 764-5298
	Big Rapids: Abigail S. Timme Library, Ferris State University	(616) 592-3602
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library and Information Center	(612) 372-6570
Mississippi	Jackson: Mississippi Library Commission	(601) 359-1036
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4281
Nebraska	Lincoln: Engineering Library, University of Nebraska-Lincoln	(402) 472-3411
Nevada	Reno: University of Nevada, Reno Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7782
	Piscataway: Library of Science and Medicine, Rutgers University	(908) 445-2895
New Mexico	Albuquerque: University of New Mexico General Library	(505) 277-4412
New York	Albany: New York State Library	(518) 474-5355
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	New York Public Library (The Research Libraries)	(212) 930-0917
North Carolina	Raleigh: D.H. Hill Library, North Carolina State University	(919) 515-3280
North Dakota	Grand Forks: Chester Fritz Library, University of North Dakota	(701) 777-4888
Ohio	Cincinnati and Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 292-6175
	Toledo/Lucas County Public Library	(419) 259-5212
Oklahoma	Stillwater: Oklahoma State University Center for International Trade Development	(405) 744-7086
Oregon	Portland: Paul L. Boley Law Library, Lewis & Clark College	Not Yet Operational
	Salem: Oregon State Library	(503) 378-4239
Pennsylvania	Philadelphia, The Free Library of	(215) 686-5331
	Pittsburgh, Carnegie Library of	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Puerto Rico	Mayaquez General Library, University of Puerto Rico	Not Yet Operational
Rhode Island	Providence Public Library	(401) 455-8027
South Carolina	Clemson University Libraries	(803) 656-3024
South Dakota	Rapid City: Devereaux Library, South Dakota School of Mines and Technology	(605) 394-6822
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8877
	Nashville: Stevenson Science Library, Vanderbilt University	(615) 322-2775
Texas	Austin: McKinney Engineering Library, University of Texas at Austin	(512) 495-4500
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-3826
	Dallas Public Library	(214) 670-1468
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Virginia	Richmond: James Branch Cabell Library, Virginia Commonwealth University	(804) 828-1104
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
West Virginia	Morgantown: Evansdale Library, West Virginia University	(304) 293-2510
Wisconsin	Madison: Kurt F. Wendt Library, University of Wisconsin Madison	(608) 262-6845
	Milwaukee Public Library	(414) 286-3051
Wyoming	Casper: Natrona County Public Library	(307) 237-4935

PATENT EXAMINING CORPS

BRUCE A. LEHMAN, Commissioner
LAWRENCE J. GOFFNEY Jr., Assistant Commissioner for Patents
EDWARD R. KAZENSKE, Deputy Assistant Commissioner for Patents
STEPHEN G. KUNIN, Deputy Assistant Commissioner for Patent Policy
J.O. THOMAS, JR., Deputy Assistant Commissioner for Patent Process Services

PATENT EXAMINING GROUPS	Phone number Area Code 703	New Case Date*
CHEMICAL EXAMINING GROUPS		
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, ENGINEERING AND DESIGNS, GROUP 1100—JOHN E. KITTLE, Director	308-0661	05/12/94
ORGANIC CHEMISTRY, DRUG, BIO-AFFECTING AND BODY TREATING COMPOSITION, GROUP 1200—RICHARD V. FISHER, Director	308-1235	06/22/94
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 1300—BARRY S. RICHMAN, Director	308-0651	08/22/94
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY STOCK MATERIALS AND COMPOSITIONS, GROUP 1500—THEODORE MORRIS, Director	308-2351	08/18/94
BIOTECHNOLOGY, GROUP 1800—JOHN J. DOLL, Director	308-0196	02/22/94
ELECTRICAL EXAMINING GROUPS		
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 2100—STEWART LEVY, Director	308-1782	11/22/93
SPECIAL LAWS AND ADMINISTRATION, GROUP 2200—ROBERT E. GARRETT, Director	308-0511	04/05/94
COMPUTER SYSTEMS AND COMPUTER APPLICATION, GROUP 2300—BOBBY R. GRAY, Director	305-9600	05/26/93
SPECIAL COMPUTER APPLICATIONS: COMPUTER GRAPHICS, BUSINESS PRACTICES, & DIAGNOSTIC TESTING, GROUP 2400—GERALD GOLDBERG, Director	305-3800	03/25/94
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 2500—JANICE A. HOWELL, Director	308-0956	03/29/94
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 2600—NICHOLAS P. GODICI, Director	305-4700	02/22/94
DESIGN, GROUP 2900—JOHN E. KITTLE, Director	308-0661	04/04/94
MECHANICAL EXAMINING GROUPS		
HANDLING AND TRANSPORTATION MEDIA, GROUP 3100—F.R. SCHMIDT, Director	308-1113	05/08/94
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 3200—CARLTON R. CROYLE, Director	308-1148	05/17/94
MEDICAL INSTRUMENTS, DIAGNOSTIC EQUIPMENT AND TREATMENT DEVICES; SURGERY AND SURGICAL SUPPLIES; AMUSEMENT AND EXERCISING DEVICES; ANIMAL HUSBANDRY; SPORTING GOODS; TOBACCO PRODUCTS AND MANUFACTURING EQUIPMENT; AND PRINTING, GROUP 3300—J.J. LOVE, Director	308-0858	08/02/94
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 3400—DONALD G. KELLY, Director	308-0861	06/30/94
GENERAL CONSTRUCTION, PETROLEUM AND MINING ENGINEERING, GROUP 3500—A.L. SMITH, Director	308-1021	05/23/94

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*A communication from the examiner should have been received in most applications filed prior to this date.

Patents will Expire as Follows:

(1) The term of any utility or plant patent that is in force on or results from an application filed before June 8, 1995 is the greater of the 20 year term provided in 35 U.S.C. 154(a)(2) or 17 years from grant subject to any terminal disclaimers. 35 U.S.C. 154(c)(1).

(2) All utility and plant patents granted on applications having an actual United States filing date on or after June 8, 1995 are granted for a term which begins on the date on which the patent is granted and ends 20 years from the date on which the application was filed in the United States. If the application contains a specific reference to an earlier application under 35 U.S.C. 120, 121 or 365(c), the patent term ends twenty years from that date on which the earliest application was filed. 35 U.S.C. 154(a)(2).

(3) All design patents are granted for a term of 14 years from the date of the grant.

However, the term of any patent may have been curtailed by disclaimer under the provisions of 35 U.S.C. 153, have lapsed due to failure to pay maintenance fees, or have been extended under the provisions of 35 U.S.C. 154, 155, or 156. Thus, if more reliable information is needed with respect to a particular patent, then the specific patent file should be reviewed to determine the actual date of patent expiration.

TRADEMARK OPERATION

Bruce A. Lehman, Commissioner
Philip G. Hampton, II, Assistant Commissioner
Robert M. Anderson, Deputy Assistant Commissioner
David E. Bucher, Director, Trademark Examining Office
Condition of Trademark Applications as of October 1, 1995

Law Office	Oldest Date	
	New*	Amendment Filed
Law Office 101—Ron Sussman, Acting Managing Attorney, (703) 308-9101—4th Floor Foods, Beverages, Wines & Spirits—Int. Classes 29, 30, 31, 32, 33 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	03/23/95	05/25/95
Law Office 102—Myra Kurzbard, Managing Attorney, (703) 308-9102—5th Floor Scientific Equipment & Furniture—Int. Classes 9, 20 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	05/23/95	07/03/95
Law Office 103—Kathryn Erskine, Managing Attorney, (703) 308-9103—5th Floor Scientific Equipment & Furniture—Int. Classes 9, 20 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	04/26/95	08/21/95
Law Office 104—Sidney Moskowitz, Managing Attorney, (703) 308-9104—6th Floor Unwrought metals, Industrial Equipment, Tools, Installation, Vehicles, Firearms, Musical Instruments, Building Materials & Floor Coverings—Int. Classes 6, 7, 8, 11, 12, 13, 15, 19, 27 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	04/06/95	08/14/95
Law Office 105—Thomas Howell, Managing Attorney, (703) 308-9105—6th Floor Chemicals, Paints, Lubricants, Pharmaceuticals, Medical Apparatus & Tobacco—Int. Classes 1, 2, 4, 5, 10, 34 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	05/23/95	05/01/95
Law Office 106—Mary Sparrow, Managing Attorney, (703) 308-9106—7th Floor Cosmetics, Cleaning Preparations, Paper Products & Toys—Int. Classes 3, 16, 28 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	02/14/95	07/03/95
Law Office 107—Thomas Lamone, Managing Attorney, (703) 308-9107—7th Floor Cosmetics, Cleaning Preparations, Paper Products & Toys—Int. Classes 3, 16, 28 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	06/02/95	07/24/95
Law Office 108—David Shallant, Managing Attorney, (703) 308-9108—8th Floor Precious metals, Fibers, Leather goods, Housewares, Cordage, Yarns, Fabrics, Clothing & Notions–Int. Classes 14, 17, 18, 21, 22, 23, 24, 25, 26 Services–Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	05/15/95	06/17/95
Law Office 109—Deborah Cohn, Managing Attorney, (703) 308-9109—8th Floor Precious metals, Fibers, Leather goods, Housewares, Cordage, Yarns, Fabrics, Clothing & Notions—Int. Classes 14, 17, 18, 21, 22, 23, 24, 25, 26 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	06/30/95	05/30/95
**Collective Marks—Class 200 **Certification Marks—Classes A & B		
Office of Trademark Services—John Walker, Director, (703) 308-9100 Trademark Assistance Center—(703) 308-9000 Pre-Examination—Alan Lambert, Supervisor, (703) 308-9401 ext. 188 Intent-To-Use—(ITU)—(703) 308-9500 Post Registration Section—Mary Bowman, Supervisor, (703) 308-9500 ext. 126		
Affidavits Under Sections 8 & 15 (All Classes)	02/14/95	—0—
Renewals (All Classes)	07/25/95	—0—
Section 12(c) Publications (All Classes)	04/11/95	—0—

1. ** Assigned to all Law Office

2. Applicants with inquires concerning the status of their applications and a touch tone phone should call (703) 305-8747 through (703) 305-9752 from 6:30 a.m. to Midnight EST, Monday thru Friday. This automated voice system will provide the current status of your application. Applicants are urged not to file unnecessary inquires concerning the status of their applications. See SECTION 411 of the TRADEMARK MANUAL OF EXAMINING PROCEDURE.

3. * These dates identify the oldest unassigned new case in each Law Office. All cases with earlier dates have either been examined and made the subject of an action or are currently being worked on by the assigned examining attorney.

REEXAMINATIONS

OCTOBER 31, 1995

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 4,318,836 (2706th)
TITANIUM DIOXIDE FILLED POLYPHENYLENE ETHER COMPOSITIONS

Visvaldis Abolins, Delmar, N.Y., assignor to General Electric Company, Pittsfield, Mass.

Reexamination Request No. 90/003,025, Apr. 12, 1993.

Reexamination Certificate for Patent 4,318,836, issued Mar. 9, 1982, Ser. No. 209,796, Nov. 24, 1980.

Int. Cl.^{6} C08K *5/52;3/22;* **C08L** *53/00*

U.S. Cl. 524—141

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1–9 are cancelled.

[1. A thermoplastic composition comprising:

(a) a polyphenylene ether resin, alone, or together with an impact modifier;

(b) an effective amount of a plasticizer; and

(c) titanium dioxide having mean particle size no greater than 0.6 micron.]

B1 4,648,388 (2707th)
APPARATUS AND METHOD FOR MAINTAINING VERTEBRAE IN A DESIRED RELATIONSHIP

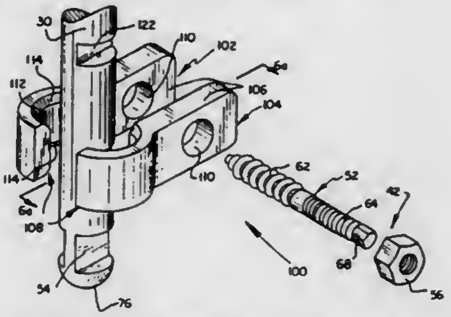
Arthur D. Steffee, Moreland Hills, Ohio, assignor to Acromed Corp., Cleveland, Ohio

Reexamination Request No. 90/003,381, Mar. 31, 1994.

Reexamination Certificate for Patent 4,648,388, issued Mar. 10, 1987, Ser. No. 793,901, Nov. 1, 1985.

Int. Cl.^{6} A61F *5/00;* **A61B** *17/70*

U.S. Cl. 606—61



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claim 1–6 is confirmed.

Claims 7 and 8 are cancelled.

New claim 9 is added and determined to be patentable.

1. An apparatus for maintaining vertebrae in a desired relationship, said apparatus comprising:

a rod, said rod being deformable to a configuration which is a function of a desired curvature of a spine, said rod having a sufficient length and rigidity to maintain at least three adjacent vertebra in the desired relationship;

clamp means for gripping a portion of said rod, said clamp means having a clamp portion which includes inner surfaces which circumscribe said rod, said clamp means also having a base portion projecting outwardly from one side of said clamp portion, said base portion includes surface means defining an opening which is offset to one side of said rod; and

fastener means for securing said clamp means to a vertebra and for pressing said inner surfaces of said clamp means against an outer side surface of said rod to hold said rod against axial and rotational movement relative to said clamp means, said fastener means including an externally threaded member extending through the opening in said base portion and having a central axis extending transversely to a central axis of said rod, said externally threaded member including first thread means for engaging a vertebra disposed on a first side of said clamp means, second thread means extending outwardly of a second side of said clamp means, and internally threaded means for engaging said second thread means and applying force against said clamp means to press said clamp means against the vertebra engaged by said first thread means.

B1 4,715,383 (2708th)
METHOD FOR REDUCING ARTIFACTS IN NMR IMAGES

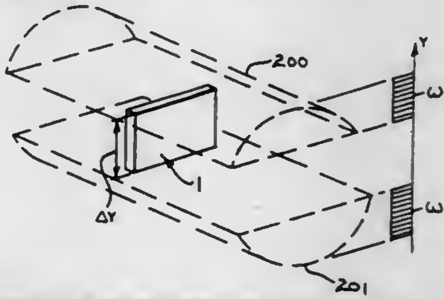
Richard L. Ehman, and Joel P. Felmlee, both of Rochester, Minn., assignors to Mayo Medical Resources, Rochester, Minn.

Reexamination Request No. 90/003,739, Feb. 21, 1995.

Reexamination Certificate for Patent 4,715,383, issued Dec. 29, 1987, Ser. No. 928,504, Nov. 10, 1986.

Int. Cl.^{6} A61B *5/055*

U.S. Cl. 128—653.2



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1–5 is confirmed.

1. A method for eliminating artifacts in an NMR image of a volume of interest, the steps comprising:

acquiring NMR data for reconstructing the NMR image as a series of NMR measurements which each excite spins in the volume of interest;

executing a series of saturation pulse sequences which are interleaved with the NMR measurements, wherein each saturation pulse sequence includes the steps of:

(a) producing a magnetic field gradient which establishes Larmor resonant conditions in an adjacent region outside the volume of interest; and

(b) producing a transverse excitation field pulse which causes saturation of spins located in said adjacent region but not in the volume of interest; and

wherein the saturation pulse sequence is executed at a rate which maintains the net longitudinal magnetization of the spins in said adjacent region at a magnitude less than that of the spins in the volume of interest.

B1 4,719,905 (2709th)
APPARATUS AND METHOD FOR MAINTAINING VERTEBRAE IN A DESIRED RELATIONSHIP

Arthur D. Steffee, Moreland Hills, Ohio, assignor to AcroMed Corp., Cleveland, Ohio

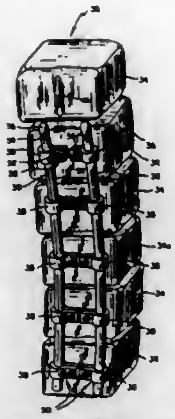
Reexamination Request No. 90/003,382, Mar. 31, 1994.

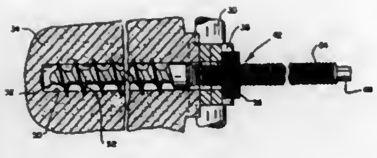
Reexamination Certificate for Patent 4,719,905, issued Jan. 19, 1988, Ser. No. 936,314, Dec. 1, 1986.

Int. Cl.^{6} A61F *5/04;* **A61B** *17/70*

U.S. Cl. 606—61

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:





Claims 8–10 are cancelled.

Claims 1, 4, 11 and 13 are determined to be patentable as amended.

Claims 2, 3, 5–7 and 12, dependent on an amended claim, are determined to be patentable.

1. An apparatus for maintaining a vertebrae in a desired relationship, said apparatus comprising:

a rod, said rod being deformable to a configuration which is a function of a desired curvature of a spine, said rod having sufficient length and rigidity to maintain the vertebrae in the desired relationship;

clamp means for gripping a portion of said rod, said clamp means having a clamp portion which includes inner surfaces which circumscribe said rod, said clamp means also having a base portion projecting outwardly from one side of said clamp portion, said base portion includes surface means defining an opening which is offset to one side of said rod;

fastener means for securing said clamp means to a vertebra and for pressing said inner surfaces of said clamp means against an outer side surface of said rod to hold said rod against axial and rotational movement relative to said clamp means, said fastener means including an externally threaded member extending through the opening in said base portion and having a central axis extending transversely to a central axis of said rod, said externally threaded member including threads for engaging a vertebra disposed on a first side of said clamp means; *and*

said surface means defining the opening in said base portion including means for permitting rotation of said clamp means relative to said fastener threaded member while said threaded member extends through the opening in said base portion +G *and said fastener means is in a loosened condition to position said clamp means in any one of a plurality of positions relative to said threaded member.*

B1 4,784,317 (2710th)
ONE PIECE MAILER FOR LASER PRINTER

Tien-Tsung Chen, Claremont; Ghanshyam H. Popat, Alta Loma, and Stephanie A. Streeter, Pacific Palisades, all of Calif., assignors to Avery International Corp., Pasadena, Calif.

Reexamination Request No. 90/003,541, Aug. 19, 1994.

Reexamination Certificate for Patent 4,784,317, Issued Nov. 15, 1988, Ser. No. 64,074, Jun. 17, 1987.

Int. Cl.^{6} B65D *27/04;27/14*

U.S. Cl. 229—92.3

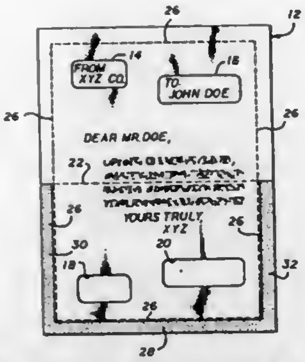
AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1–21 is confirmed.

New claims 22 and 23–32 are added and determined to be patentable.

22. A one-piece mailer for use with laser printers or copier machines, involving the heating of the paper, comprising:

a sheet of paper for receiving a printed message, said sheet of paper having an upper half, a lower half and a front side, said upper half constituting a single thickness sheet that is free of cut-outs such as address windows, said sheet having dimensions sufficiently large to be processed by standard types of laser printers without jamming;



printed message and address information printed solely on the front side of said sheet of paper, with the message starting on the upper half of said sheet of paper and the address information being printed on the lower half of said sheet of paper;

said sheet of paper including an integral envelope having a stable, water-activated adhesive for sealing said envelope which will not flow or become activated from the heat of a laser printer or of a xerographic copier machine or from high humidity storage conditions;

said sheet of paper being free of cut-outs such as address windows;

wherein said adhesive extends in a transverse strip across said sheet of paper, and said sheet of paper has perforations extending substantially across its width adjacent to and substantially immediately above said transverse strip of adhesive, to permit easy separation of said envelope from the remainder of the mailer;

whereby said sheet of paper may be fed through a laser printer or a copier machine without jamming or contamination.

B1 4,842,579 (2711th)
ATHERECTOMY DEVICE

Samuel Shiber, Mundelein, Ill., assignor to Surgical Systems & Instruments, Inc., Mundelein, Ill.

Reexamination Request No. 90/003,608, Oct. 19, 1994.

Reexamination Certificate for Patent 4,842,579, issued Jun. 27, 1989, Ser. No. 225,880, Jul. 29, 1988.

Continuation-in-part of Ser. No. 18,083, Feb. 24, 1987, which is a continuation-in-part of Ser. No. 874,546, Jun. 16, 1986, Pat. No. 4,732,154, which is a continuation-in-part of Ser. No. 609,846, May 14, 1984, abandoned.

Int. Cl.^{6} A61B *17/22;17/32*

U.S. Cl. 604—22

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1–5 is confirmed.

1. An atherectomy system for cutting, ingesting and removing an obstruction from within a patient's artery, comprising in combination:

a flexible guide-wire insertable into the artery,

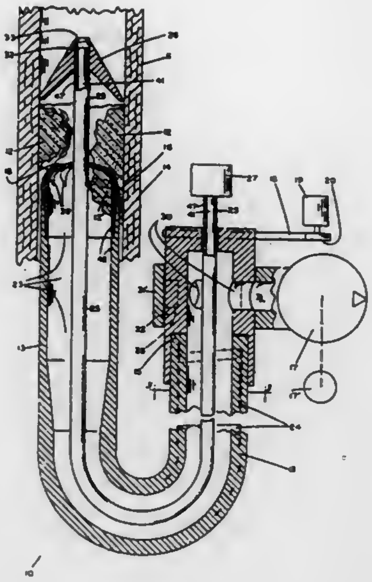
a flexible rotary catheter being rotatably disposed and insertable into the artery, over said flexible guide-wire,

a blade at a distal end of said flexible rotary catheter for cutting an obstruction located in front of said blade, said blade having teeth on its periphery which are rounded and bent toward the center of the blade and an outer wall for slidingly and rotatably bearing against the artery,

a rotating inner-wall formed by the inside surfaces of said flexible rotary catheter and said blade,

a continuous passage surrounding said flexible guide-wire for ingesting the cut obstruction material, said continuous passage being defined between said rotating inner-wall and said flexible guide-wire,

coupling means at said proximal end of said flexible rotary catheter for coupling it to a rotating means.



B1 4,988,952 (2712th)

HIGH Q SWITCHED CAPACITOR FILTER HAVING INTERNAL THIN-FILM RESISTORS

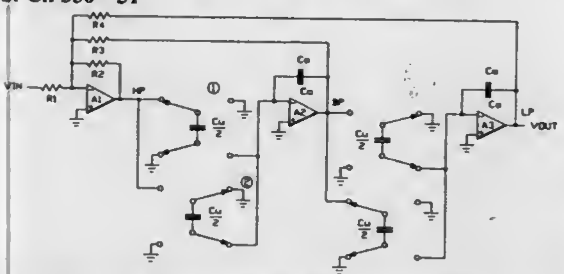
Nello G. Sevastopoulos, and Robert C. Dobkin, both of San Jose, Calif., assignors to Linear Technology Corporation, Milpitas, Calif.

Reexamination Request No. 90/003,624, Nov. 7, 1994.

Reexamination Certificate for Patent 4,988,952, issued Jan. 29, 1991, Ser. No. 362,144, Jun. 6, 1989.

Int. Cl.^{6} H03F *1/34*

U.S. Cl. 330—51



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1, 3, 4 and 7 are determined to be patentable as amended.

Claims 2, 5, 6, 8 and 9, dependent on an amended claim, are determined to be patentable.

New claims 10–15 are added and determined to be patentable.

7. In a monolithic switched capacitor filter circuit *having at least one double-sampled switched capacitor integrator, said circuit exhibiting a quality coefficient which is a nonlinear function of a resistance ratio of the values of first and second resistors coupled to said integrator wherein values of doubled-sampled switched capacitors also coupled to said integrator are selected in order to cause said nonlinear function to approach a maximum for a specific value of said resistance ratio, said circuit being* fabricated in a surface of a semiconductor substrate[, resistors for providing conduction paths in said filter circuit comprising] *wherein said resistors comprise* a plurality of thin-film resistors fabricated on said surface of said semiconductor substrate, and means connecting lengths of said thin-film resistors in said circuit *in order* to [thereby] *adjust said values of said resistors as necessary to* accurately establish *a desired value of* the quality coefficient of said circuit *in accordance with said nonlinear function.*

B1 5,011,403 (2713th)

ORTHODONTIC BRACKET MADE FROM ZIRCONIUM OXIDE

Michael Sadoun, 3 avenue Séverine, 92400 Courbevole, and Alain Decker, 113, avenue Gabriel Péri, 91700 Ste Genevieve des Bois, both of, France

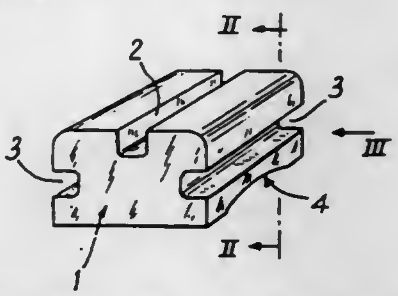
Reexamination Request No. 90/003,469, Jun. 20, 1994.

Reexamination Certificate for Patent 5,011,403, issued Apr. 30, 1991, Ser. No. 311,913, Feb. 17, 1989.

Claims priority, application France, Feb. 19, 1988, 88 02017

Int. Cl.^{6} A61C *3/00*

U.S. Cl. 433—8



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1–14 are cancelled.

1. A nonporous ceramic bracket for bonding to the external face of a tooth consisting essentially of sintered small zirconium oxide particles partially stabilized by a transition metal oxide, said bracket having a color and translucency substantially corresponding to those of said tooth.

B1 5,073,433 (2714th)

THERMAL BARRIER COATING FOR SUBSTRATES AND PROCESS FOR PRODUCING IT

Thomas A. Taylor, Indianapolis, Ind., assignor to Praxair S.T. Technology, Inc., North Haven, Colo.

Reexamination Request No. 90/003,326, Jan. 14, 1994.

Reexamination Certificate for Patent 5,073,433, issued Dec. 17, 1991, Ser. No. 424,613, Oct. 20, 1989.

Int. Cl.^{6} B32B *3/10*

U.S. Cl. 428—134

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1–20 are determined to be patentable as amended.

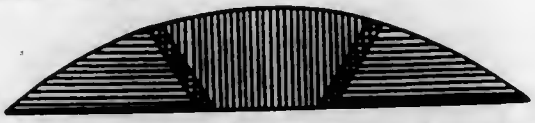
1. A *substrate coated with a* thermal barrier coating [for substrates], *said coating* comprising zirconia partially stabilized by yttria and having a density greater than 88% of theoretical [density with]*density, wherein said coating contains* a plurality of [vertical macrocracks] substantially homogeneously dispersed [throughout the coating] *vertical macrocracks extending into the coating from the substrate interface and* in which a cross-sectional area of the coating normal to the substrate exposes a plurality of vertical [macrocracks] *cracks* with at least 70% of said vertical [macrocrack extending] *cracks being in the form of macrocracks, said macrocracks having a length of* at least 4 mils [in length up to the thickness of the coating] and [having] *wherein said coating has* from 20 to 200 vertical macrocracks per linear inch measured in a line parallel to the surface of the substrate and in a plane perpendicular to the substrate.

B1 5,080,472 (2715th)
MULTIFOCAL OPTICAL LENS

Amitava Gupta, Pasadena, Calif., assignor to Ioptex Research, Inc., Azusa, Calif.

Reexamination Request No. 90/002,745, Jun. 4, 1992.
Reexamination Certificate for Patent 5,080,472, issued Jan. 14, 1992, Ser. No. 383,797, Jul. 21, 1989.
Int. Cl.⁶ G02B *3/10;* **G02C** *7/06*

U.S. Cl. 359—652



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **4**, **7** and **16** is confirmed.

Claims **1–3**, **5**, **6** and **8–15** are cancelled.

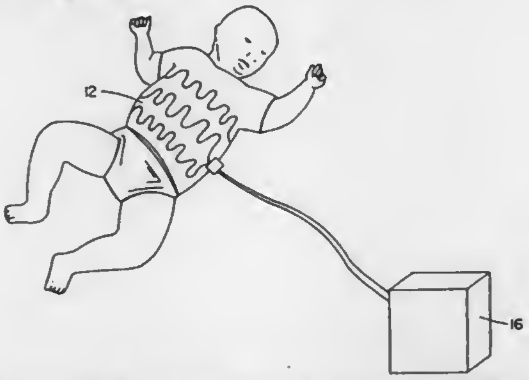
4. A method of making a multifocal lens of claim 2 which comprises polymerizing at least two suitable monomers M_1 and M_2 to form a polymer comprising a first zone having a specified refractive index into sheet form, removing polymeric material from the first zone to form two cavities, adding a mixture of monomers which contain at least monomers M_1 and M_2 in a mole ratio sufficient upon polymerization to form a polymer having a refractive index which differs from the refractive index of the polymer comprising the first zone if not more than 0.1 units and by not less than 0.01 units into the two cavities, thereby forming a third zone between the first and second zones and a fifth zone between the second and fourth zones which comprise a polymer having at least two monomers common to the monomer mixture of the polymer of the other zones and having a refractive index continuously variable between that of the polymer comprising the other zones, the zones being transparent and having no visible discontinuities between adjacent zones.

B1 5,241,300 (2716th)
SIDS DETECTION APPARATUS AND METHODS

Johannes Buschmann, Birkenleiten 9, 8000 München 90, Germany

Reexamination Request No. 90/003,388, Feb. 25, 1994.
Reexamination Certificate for Patent 5,241,300, issued Aug. 31, 1993, Ser. No. 874,297, Apr. 24, 1992.
Int. Cl.⁶ G08B *21/00*

U.S. Cl. 340—573



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1**, **3**, **8** and **11** are determined to be patentable as amended.

Claims **2**, **4–7**, **9**, **10** and **12–19**, dependent on an amended claim, are determined to be patentable.

New claims **20**, **21**, **22** and **23** are added and determined to be patentable.

1. A method of monitoring the respiration of an infant comprising the steps of:

placing optical fiber means adjacent to the respiratory parts of the infant to be monitored;

feeding light into the fiber using up to the full maximum acceptance angle of the fiber, where the maximum acceptance angle of the fiber 2α results from the numerical aperture of NA of the fiber

$$\sin\alpha = NA = \sqrt{n_1^2 - n_2^2}$$

where n_1 is the core refractive index and n_2 is the cladding refractive index, and transmitting light from a light source through the fiber means onto a photoelectric converter;

monitoring changes in the intensity of the transmitted light as a function of the movement of the fiber means in response to the movement of respiratory parts of the infant;

comparing changes in the intensity of transmitted light through movement of the fiber means corresponding to the infant's respiratory effects, with a predetermined threshold, indicating whether or not the infant is breathing;

comparing the time elapsed since the last respiratory effect with a given maximum tolerable respiratory arrest time; and

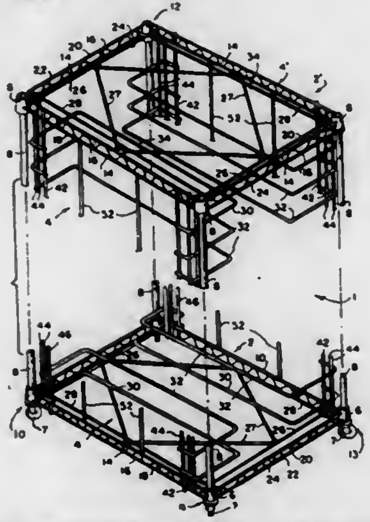
giving an alarm if the elapsed time exceeds the predetermined tolerable respiratory arrest time.

B1 5,263,595 (2717th)
MODULAR RACK SYSTEM FOR USE WITH REMOVABLE PANS

Frank J. Hilstolsky, Dallas, Pa., assignor to Metro Industries Inc., Reno, Nev.

Reexamination Request No. 90/003,574, Sep. 16, 1994.
Reexamination Certificate for Patent 5,263,595, issued Nov. 23, 1993, Ser. No. 774,356, Oct. 10, 1991.
Int. Cl.⁶ A47F *5/00*

U.S. Cl. 211—126



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **17–19**, **21–29**, **34** are confirmed.

Claims **1–16**, **20**, **30–33**, **35–36** are cancelled. .

New claims **37–46** are added and determined to be patentable.

37. A rack system, comprising:

a horizontal base frame assembly having at least two edge members at about the periphery thereof, each of said edge members having a first thickness;

a horizontal top frame assembly having at least two edge members at about the periphery thereof, each of said edge members having a second thickness; and

a pair of opposed vertical support assemblies, each of said pair of vertical support assemblies comprising at least four spaced support rods each having a base end and a top end, and a plurality of spaced support brackets being secured to at least certain of said support rods at points where said support brackets intersect said certain support rods, wherein said *support rods terminate at the base ends and at the top ends thereof in projecting portions, at least two of said base end projecting portions being separated by a horizontal distance about equal to or less than said first thickness and said base end projecting portions engaging and interlocking therebetween one of said base frame assembly edge members, at least two of said top end projecting portions being separated by a horizontal distance about equal to or less than said second thickness and said top end projecting portions engaging and interlocking therebetween one of said top frame assembly edge members such that each of said pair of vertical support assemblies is restricted frommovement relative to said base frame assembly and said top frame assembly in first and second directions;*

said plurality of support brackets thereby being arranged in substantially co-planar facing pairs to support at least one removable pan between said pairs of vertical support assemblies.

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REISSUES

OCTOBER 31, 1995

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

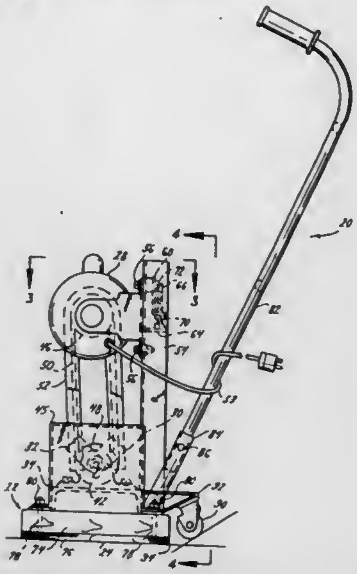
Re. 35,073
APPARATUS AND METHOD FOR REMOVING OIL SPOTS FROM A SURFACE

Maylon E. Dickey, Hayti, Mo., and Billy R. Dickey, Fort Meyers, Fla., assignors to Gary N. Martin, and Judy A. Wilkens, both of Aurora, Colo.

Original No. 4,947,940, dated Aug. 14, 1990, Ser. No. 298,471, Jan. 18, 1989. Continuation of Ser. No. 726,580, Jul. 8, 1991, abandoned. Application for reissue Aug. 26, 1992, Ser. No. 935,653

Int. Cl.^{6} B08B *7/02*

U.S. Cl. 134—6 **4 Claims**



7. A method of removing oil spots from a concrete surface with power driven vibrator apparatus having a platen with a releasably secured lower member of wood, comprising the steps of:

spreading granular material which is absorbent and abrasive over an oil spot;

placing the platen over the granular material;

vibrating the platen to repetitively compress and release the granules so that the granular material is rubbed against the oil spot by the lower member of the platen to abrade the oil spot and absorb the oil and wear away the lower wood member; and

removing the granular material from the cleaned concrete surface.

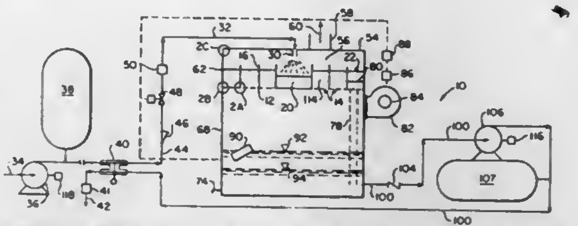
Re. 35,074
REMOVING HAZARDOUS CONTAMINANTS FROM WATER

Bruce L. Lamarre, Piermont, N.H., assignor to North East Environmental Products, Inc., Lebanon, N.H.

Original No. 5,045,215, dated Sep. 3, 1991, Ser. No. 424,678, Oct. 20, 1989. Division of Ser. No. 257,935, Oct. 14, 1988, which is a continuation-in-part of Ser. No. 72,553, Jul. 13, 1987, Pat. No. 4,869,832. Application for reissue Feb. 9, 1993, Ser. No. 15,448

Int. Cl.^{6} C02F *1/20*

U.S. Cl. 210—747 **13 Claims**



1. A method for removing hazardous contaminants from water comprising:

distributing the contaminated water upon the intake portion of a baffled and perforated tray,

flowing the contaminated water in a curved flowpath across said tray from said intake portion toward an output portion, and causing sufficient air to flow upwardly through perforations in said tray so that the water flowing along said flowpath forms a deep froth while maintaining frothing throughout said flowpath.

13. The method of claim 1 wherein said forth along said flowpath has a depth in the range of from 4 to 6 inches.

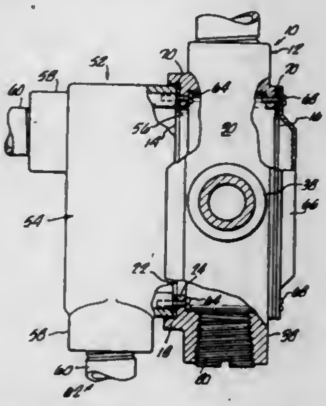
Re. 35,075
+G [ELECTRICAL CONDULET EXTENSION BOX]+EP +G +I EXTENSION FOR ELECTRICAL JUNCTION BOX +EP

Albert Lammens, Jr., Covina, Calif., assignor to Condulet Adapter, Inc., Del Mar, Calif.

Original No. 5,169,013, dated Dec. 8, 1992, Ser. No. 736,001, Jul. 25, 1991. Continuation-in-part of Ser. No. 517,508, Apr. 26, 1990, abandoned, which is a continuation of Ser. No. 372,132, Jun. 27, 1989, abandoned, which is a continuation of Ser. No. 155,985, Feb. 16, 1988, abandoned. Application for reissue Mar. 7, 1994, Ser. No. 207,822

Int. Cl.^{6} H02G *3/08*

U.S. Cl. 220—3.2 **12 Claims**



7. An extension box for an electrical junction box, comprising:

a body having sides and ends and a front and a rear;

a shear force carrying rim extending from the front of an outer perimeter of said body, said rim having an inner wall defining a coupling opening;

a floor adjacent to and surrounded by said rim, connected to said body and extending generally perpendicular to said rim, said floor having front mounting holes and a central opening therethrough;

a boss extending from the rear of said body and having an outer wall dimensioned to be engageable with the coupling opening,

said boss having rear mounting holes therethrough aligned with the front mounting holes; and

means for electrically connecting the front of the body to the rear of the body.

Re. 35,076

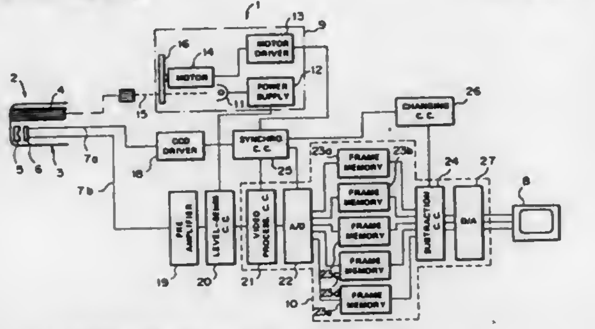
ENDOSCOPE APPARATUS FOR DISPLAYING IMAGES BELOW THE MUCOUS MEMBRANCE

Kazunari Nakamura, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Original No. 4,945,409, dated Jul. 31, 1990, Ser. No. 247,194, Sep. 21, 1988. Application for reissue Oct. 18, 1991, Ser. No. 780,642

Int. Cl.⁶ H04N *7/18;5/335;* **A61G** *1/06*

U.S. Cl. 348—70 **32 Claims**



17. An endoscope apparatus comprising:

an elongated insertable part having an illuminating window and observing window in a tip part;

a light source part emitting an illuminating light;

a light guide means, inserted through said insertable part, for transmitting said illuminating light and for illuminating an object from said illuminating window;

an imaging means for receiving reflected light from said object through said observing window and for converting said reflected light to an electric signal;

a light separating means interposed in an optical path of said illuminating light between said light source part and imaging means, for separating the light entering said imaging means into a plurality of wavelength bands;

a video signal processing means for processing the electric signal of said imaging means to produce a plurality of video signals;

an operating means for removing video information included in one video signal by operating on at least two of a plurality of video signals based on light of said plurality of wavelength bands separated by said light separating means which are output signals of said video signal processing means;

a changing means for selecting at least one of the video image information output by said operating means and a video signal and for composing a usual color observing picture image output from said signal processing means; and

a monitor means for displaying a picture image from input signals selected by said changing means.

Re. 35,077

ELECTRICAL TRANSIENT SURGE PROTECTION

Edward Allina, 605 Capri Blvd., Treasure Island, Fla. 33706

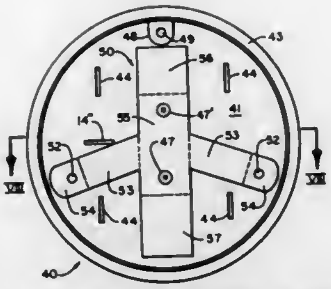
Original No. 4,931,895, dated Jun. 5, 1990, Ser. No. 923,524, Oct. 28, 1986. Application for reissue Nov. 29, 1991, Ser. No. 800,086

Int. Cl.⁶ H02H *9/04*

U.S. Cl. 361—56 **13 Claims**

8. Adapter means for retrofitting electrical utility watt-hour meters with protection against surge damage from lightning or other transient source, comprising

a housing member having an edge flange and being provided with



power input and power output terminals, adapted to plug into socket means of a meter mounting utility box into which such a meter normally plugs;

socket terminals, into which such a meter is likewise equipped to plug, connected respectively to the plug terminals; and

varistor means connected between at least one such power input terminal and external grounding means via at least one intervening conductive means, wherein the intervening conductive means includes a strip adjacent the edge flange and a fastener extending through the housing member to said strip.

Re. 35,078

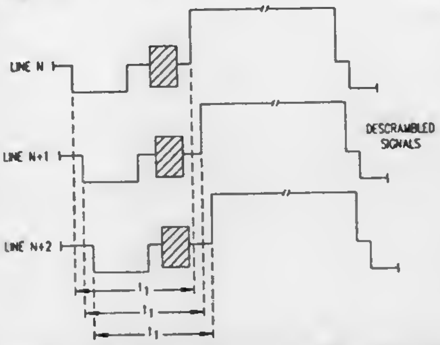
METHOD AND APPARATUS FOR ENCRYPTING AND DECRYPTING TIME DOMAIN SIGNALS

John O. Ryan, Cupertino, Calif., assignor to Macrovision Corporation, Mountain View, Calif.

Original No. 5,058,157, dated Oct. 15, 1991, Ser. No. 403,514, Sep. 6, 1989. Application for reissue Oct. 15, 1993, Ser. No. 137,582

Int. Cl.⁶ H04N *7/167*

U.S. Cl. 380—11 **18 Claims**



1. A method of decrypting previously encrypted information signals to permit use thereof, said encrypted information signals comprising encrypted versions of original information signals arranged as a succession of lines of active information, each line having a line timing reference, said encrypted signals having been produced by time shifting at least some of the lines of the original information signals with respect to the line timing reference in a predetermined manner [with the amount of time shifting in each line in the succession being different than that of the previous line], said decrypting method comprising the steps of:

(a) providing an indication of the amount of time shifting performed on a given line; and

(b) restoring the original time relationship for each line between the line timing reference and the line of information using the indication of the time shifting by generating deliberately temporally misaligned line timing reference for each line and combining said deliberately temporally misaligned line timing reference with the line of information.

PLANT PATENTS

GRANTED OCTOBER 31, 1995

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

9,344

HYBRID TEA ROSE PLANT NAMED 'JACDEEP'

Keith W. Zary, Thousand Oaks, Calif., assignor to Bear Creek Gardens, Inc., Medford, Oreg.

Filed Oct. 3, 1994, Ser. No. 316,864

Int. Cl.^{6} A01H ***5/00***

U.S. Cl. Plt.—20 **1 Claim**

1. A new and distinct variety of rose plant of the Hybrid Tea class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of its deep rose-pink flower color, large flower size, long, strong stems, good cut-flower production and its vigorous, upright growth habit.

9,345

HYBRID TEA ROSE PLANT NAMED 'JACRAL'

Keith W. Zary, Thousand Oaks, Calif., assignor to Bear Creek Gardens, Inc., Medford, Oreg.

Filed Oct. 3, 1994, Ser. No. 316,898

Int. Cl.^{6} A01H ***5/00***

U.S. Cl. Plt.—20 **1 Claim**

1. A new and distinct variety of rose plant of the Hybrid Tea class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of its non-fading, bright red flowers, dark green, glossy, mildew resistant foliage, long stems, moderate fragrance, and good vase life.

9,346

DAWN REDWOOD VARIETY "GOLDEN OJI"

Masaru Shibata, Kameyama, Japan, assignor to New Oji Paper Co., Ltd., Tokyo, Japan

Filed Aug. 16, 1994, Ser. No. 291,955

Int. Cl.^{6} A01H ***5/00***

U.S. Cl. Plt.—50.1 **1 Claim**

1. A new and distinctive variety of *Metasequoia glyptostroboides* ('Dawn Redwood'), substantially as herein illustrated and described, characterized particularly as to novelty by that the color of leave is bright yellow like gold especially in summer changing to brown in fall, and that the growth rate is slightly slower than the normal type.

9,347

POINSETTIA PLANT NAMED 'FISBON'

Katharina Zerr, Simmern, Germany, assignor to Florfis AG, Binningen, Switzerland

Filed Oct. 24, 1994, Ser. No. 327,929

Claims priority, application Germany, Dec. 29, 1993, EUP 150

Int. Cl.^{6} A01H ***5/00***

U.S. Cl. Plt.—86.4 **1 Claim**

1. A new and distinct poinsettia plant named Fisbon, as illustrated and described.

9,348

ALSTROEMERIA 'PATRIOT'

Mark P. Bridgen, Storrs, Conn., assignor to University of Connecticut, Storrs, Conn.

Filed Dec. 13, 1994, Ser. No. 355,062

Int. Cl.^{6} A01H ***5/00***

U.S. Cl. Plt.—87.1 **1 Claim**

1. A new and distinctive Alstroemeria plant substantially as herein shown and described, distinguished by its unique flower color, short growth habit, strong and numerous flowering stems, and numerous florets per inflorescence.

9,349

VARIETY OF GERANIUM NAMED ANGELA

David Lemon, Lompoc, Calif., assignor to John Bodger & Sons Company, South El Monte, Calif.

Filed Jul. 27, 1994, Ser. No. 281,735

Int. Cl.^{6} A01H ***5/00***

U.S. Cl. Plt.—87.12 **1 Claim**

1. A new and distinct variety of geranium plant, substantially as shown and described.

9,350

FLORIBUNDA GERANIUM 'KATHERINE'

David Lemon, Lompoc, Calif., assignor to John Bodger & Sons Company, South El Monte, Calif.

Filed Jul. 27, 1994, Ser. No. 281,737

Int. Cl.^{6} A01H ***5/00***

U.S. Cl. Plt.—87.12 **1 Claim**

1. A new and distinct variety of geranium plant, substantially as shown and described.

9,351

GERANIUM PLANT NAMED 'GUISHIVA'

Jacques Guillou; Bernard Guillou, and Maurice Guillou, all of Saint-Malo, France, assignors to Ets. Guillou Freres, Saint-Malo, France

Filed Dec. 5, 1994, Ser. No. 352,713

Int. Cl.^{6} A01H ***5/00***

U.S. Cl. Plt.—87.12 **1 Claim**

1. A new and distinct cultivar of geranium plant named Guishiva, as described and illustrated.

9,352

GERANIUM PLANT NAMED 'GUIMONGOL'

Jacques Guillou; Bernard Guillou, and Maurice Guillou, all of Saint-Malo, France, assignors to Ets. Guillou Freres, Saint-Malo, France

Filed Dec. 5, 1994, Ser. No. 353,329

Int. Cl.^{6} A01H ***5/00***

U.S. Cl. Plt.—87.12 **1 Claim**

1. A new and distinct cultivar of geranium plant named Guimongol, as illustrated and described.

9,353

IVY GERANIUM NAMED 'FREESTYLE LAVENDER'

Mitchell E. Hanes, Morgan Hill, Calif., assignor to Goldsmith Seeds, Inc., Gilroy, Calif.

Filed Dec. 27, 1994, Ser. No. 364,875

Int. Cl.^{6} A01H *5/00*

U.S. Cl. Plt.—87.12 **1 Claim**

1. A new and distinct cultivar of ivy geranium substantially as herein shown and described, named Freestyle Lavender, that is characterized by: mid-green foliage with light zonation, lavender color, and semi-double flowers on large umbels, fast rooting and a compact growth habit.

9,354

KALANCHOE PLANT NAMED 'MAYA'

Claude Hope, Cartago, Costa Rica, assignor to Ball Seed Co., a Division of Geo. J. Ball, Inc., West Chicago, Ill.

Filed Jan. 30, 1995, Ser. No. 380,601

Int. Cl.^{6} A01H *5/00*

U.S. Cl. Plt.—87.15 **1 Claim**

1. A new and distinct cultivar of Kalanchoe plant named Maya, as illustrated and described.

9,355

ANTHURIUM PLANT '75-10'

Richard J. Henny, Tavares, Fla., assignor to Florida Foundation Seed Producers, Greenwood, Fla.

Filed Dec. 9, 1994, Ser. No. 353,571

Int. Cl.^{6} A01H *5/00*

U.S. Cl. Plt.—88.1 **1 Claim**

1. A new and distinct of Anthurium, substantially as described and illustrated herein, characterized particularly as to novelty by its attractive inflorescences composed of red spathes with a red-purple spadix carried on dark red-brown peduncles, flowers held slightly above the foliage, the leaves being dark green, shiny and often having light reddish-brown petioles, the plant canopy width being greater than the canopy height, and the plant habit being freely branching, compact and upright providing a cultivar well suited as a flowering pot plant having no unusual susceptibility to the traditional Anthurium diseases and insects.

PATENTS

GRANTED OCT. 31, 1995

ERRATA

For CLASS	See PATENT NO.
066–210	5,461,881
108–047	5,461,947
228–049	5,462,219
601–052	5,462,524
216–085	5,462,634
216–067	5,462,635
216–067	5,462,636
216–022	5,462,637
216–103	5,462,640
420–528	5,462,712
514–558	5,462,726
546–158	5,463,045
514–533	5,463,104
514–533	5,463,104
588–249	5,463,163
588–250	5,463,164
588–250	5,463,165
210–622	5,463,176
423–008	5,463,177
428–216	5,463,178
429–192	5,463,179
504–323	5,463,180
514–125	5,463,181
525–330	5,463,182
219–056	5,463,197
358–442	5,463,295
331–096	5,463,360
351–158	5,463,428
505–171	5,463,518
395–183	5,463,636
379–052	5,463,665

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PATENTS

GRANTED OCTOBER 31, 1995

GENERAL AND MECHANICAL

5,461,724

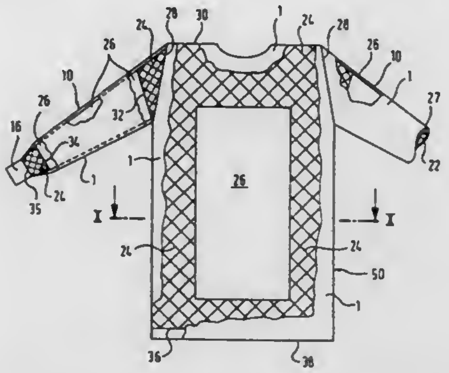
ARTICLE OF CLOTHING, IN PARTICULAR FOR THE MEDICAL OR CHEMICAL FIELD HAVING BARRIER MEMBRANE IN CRITICAL AREAS

Guenther Wiedner, Seeshaupt, Germany; John A. Duncan, Glenrothes, and Suresh R. Patel, Dalgety Bay, both of, Scotland, assignors to Rotecno AG, Zuerich, Switzerland

Continuation-in-part of Ser. No. 864,839, Apr. 7, 1992, Pat. No. 5,335,372. This application Mar. 11, 1993, Ser. No. 29,730

Int. Cl.^{6} A41D *13/00*

U.S. Cl. 2—2 **16 Claims**



1. Article of clothing for protection against at least one of liquids and micro-organisms, the article of clothing comprising at least an inner layer and an outer layer, the outer layer being a hydrophobic fabric forming a liquid barrier and a micro-organism barrier, the inner layer including at least one carrier material having a net-like, apertured or open mesh structure secured to said outer layer at at least one non-critical position at which the danger is low of passage of at least one of liquids and micro-organisms through the outer layer, and at least one membrane secured to said carrier material at at least one critical position at which the danger exists that at least one of liquid and micro-organisms passes through said outer layer.

5,461,725

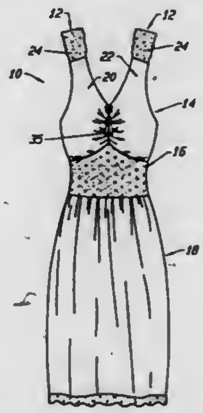
GARMENT FOR NURSING WOMAN

Pamela A. Witczak, 18620 Tanterra Way, Brookeville, Md. 20833

Filed Dec. 30, 1991, Ser. No. 814,506

Int. Cl.^{6} A41D *1/20;* **A41C** *3/04*

U.S. Cl. 2—104 **18 Claims**



1. A garment suitable for use by a woman nursing a baby, the woman having a right breast and a left breast, each breast presenting a respective size and shape, the garment comprising:

a bodice having a front and a back and further having a top portion and a bottom portion, the front having a central portion, and the bodice substantially made of a resilient, stretchable material;

a stretchable, resilient first strap having a front end connected to the top portion in the front, and a back end connected to the top portion in the back; and

a stretchable, resilient second strap having a front end connected to the top portion in the front, and a back end connected to the top portion in the back, whereby the first and second straps are substantially made of suitably stretchable material so that when the woman pulls down the bodice sufficiently, at least one breast of the woman is suitably exposed for nursing the baby, and yet the first and second straps are suitably resilient so that when the bodice is released, the garment resumes its original shape.

5,461,726

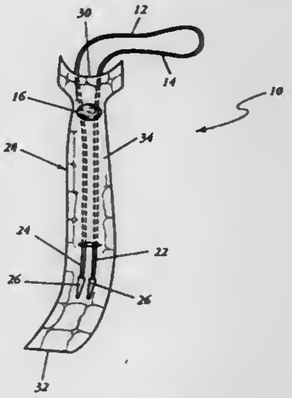
DEVICE FOR WEARING AROUND THE NECK OF A USER

Michael P. Wade, 2817 W. End Ave., Suite 203, Nashville, Tenn. 37203

Filed Sep. 21, 1994, Ser. No. 309,865

Int. Cl.^{6} A41D *25/00*

U.S. Cl. 2—144 **9 Claims**



1. A device for wearing by a user having a neck and a chest comprising:

a. an elongated string having a first end and a second end for wearing around said neck; and

b. an elongated blade portion resembling a necktie blade having an upper end for placement proximal said neck of said user and a lower end, said blade further having a first hole and a second hole and a face and a rear, said string is attached to said blade proximate said first hole and said first end and said second end pass through said second hole from said rear to said face to be exposed proximate said lower end.

5,461,727

BOUFFANT HEADPIECE

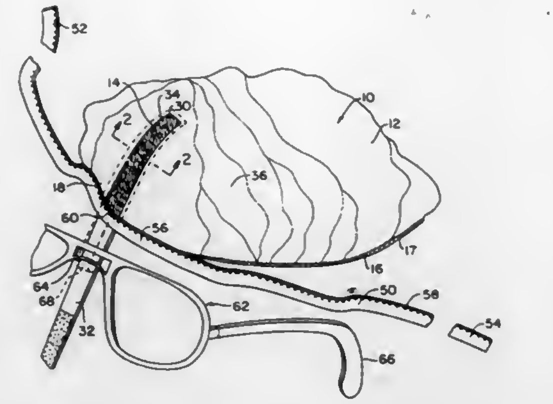
Glenda M. Braswell-Moore, 405 Maiden La., Chesapeake, Va. 23325

Filed Apr. 6, 1994, Ser. No. 223,765

Int. Cl.^{6} A42B *1/24;* **G02C** *3/00*

U.S. Cl. 2—171 **5 Claims**

1. A technician's headpiece for being placed on a technician's head for receiving the technician's head in an interior of a loose bouffant cap thereof with a front portion of said cap being approximately above the technician's nose, said headpiece further including:



an elastic compressing strand attached to, and extending about, a lower edge of the cap for contracting the lower edge of the cap onto the technician's head and thereby helping to hold the cap on the technician's head while also preventing the escape of hair and/or other contaminants from the technician's head;

an elongated, flexible, eyeglass retainer member having a proximal end portion attached to the front portion of the cap and a distal end portion for extending below the cap, passing about a bridge of eyeglasses, doubling back on itself and being fastened to itself at the front portion of said cap;

a headband strap having two free ends, said headband strap being attached to the lower edge of said cap, but only at the front portion thereof, for being wrapped about the technician's head and having its two ends fastened together to stabilize the position of the lower edge of the front portion of the cap, said strap being of such a size and shape, and being positioned so as not to substantially interfere with said distal end portion of said eyeglass retainer member being attached to said proximal end portion thereof at said front portion of said cap, whereby said eyeglass retainer member is supported by said headband strap.

5,461,728

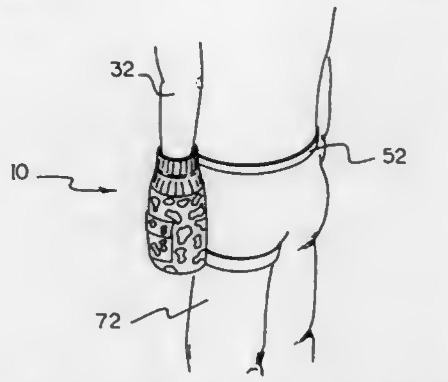
HAND WARMING MUFF AND HOLDING APPARATUS

Jeffery G. Staszak, 938 Howard St., Green Bay, Wis. 54303

Filed Jan. 19, 1995, Ser. No. 375,584

Int. Cl.⁶ A41D *27/20;13/10;19/01*

U.S. Cl. 2—247 **8 Claims**



1. A hand warming muff and holding apparatus for allowing a bow hunter to keep his hand warm during hunting and for simultaneously carrying hunting-related accessories comprising, in combination:

a hip pocket including a tubular body formed of an outer fabric layer and an inner fabric layer with an intermediate insulated layer disposed therebetween, the body having a sealed bottom end, an open top end, and an axial length about 33% greater than its diameter, the hip pocket further including an elastic ribbed fabric cuff for receiving a bow hunter's hand, the cuff having a conical hollow lower extent coupled to the top end of the body and a tubular upper extent for snugly fitting about the bow hunter's arm once his hand is disposed within the body, the hip pocket additionally including a generally rectangular exterior pocket with an upwardly extended opening affixed to the outer layer of the body for holding hunting-related accessories therein, the exterior pocket having a strip of pile-type fastener coupled thereto, a flap affixed to the body and positionable over the opening, and a strip of complimentary pile-type fastener affixed to the flap and removably securable with the pile-type fastener to seal the opening;

a leather belt loop affixed to the top end of the body of the hip pocket, the belt loop sized for receiving a belt of a bow hunter and thus allowing the hip pocket to be carried at a location proximal with the bow hunter's waist; and

a leg strap formed of a fabric material having a first free end with a pile-type fastener secured thereto, a second free end with a complimentary pile-type fastener secured thereto, and an intermediate portion between the ends affixed to the body near the bottom end thereof and with the fasteners of the leg strap removably securable in a closed loop configuration about a leg of a bow hunter to prevent unmoderated movement of the hip pocket.

5,461,729

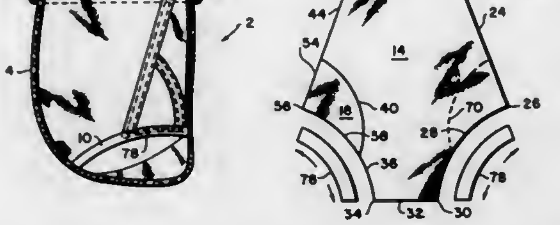
MEN'S UNDERWEAR BRIEF

William Brocks, P.O. Box 509, Cross River, N.Y. 10518

Filed Sep. 12, 1994, Ser. No. 304,150

Int. Cl.⁶ A41B *9/02*

U.S. Cl. 2—403 **1 Claim**



1. A man's underwear brief comprising a back panel, a front panel including an outer and inner panels having identical shapes and obversely stitched together, a waistband secured to upper edges of said inner and outer panels, a pair of concave lower edges of said inner and outer panels together forming a portion of leg openings, concave lower edges of said front panel having stitched thereto elastic strips in their stretched state which in their unstretched state are approximately ⅔ the length of said concave edges of said front panel, said strips contracting in the unstretched state to form a shirring effect on said concave panels thereby forming a genital pouch and secure leg enclosures.

5,461,730

PROTECTIVE HAT

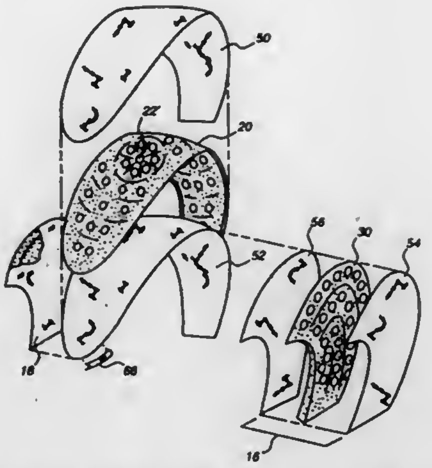
Janice D. Carrington, Worcester, Pa., assignor to Plum Enterprises, Inc., Worcester, Pa.

Filed Aug. 6, 1993, Ser. No. 103,488

Int. Cl.⁶ A42B *3/00*

U.S. Cl. 2—411 **8 Claims**

1. A protective hat having shock absorptive and insulating properties, comprising a head-receiving member adapted to overlie and protect at least the sides, top and rear of the head of a wearer, said head-receiving member comprising a core of resilient shock absorbent polymeric foam material and a shell of textile fabric material, said shell being so constructed and arranged as to fully enclose and encapsulate said core so that said hat has a conventional appearance and surface texture, said head-receiving member comprising



an arcuate member adapted to partly encircle the head of a wearer, and at least one closure member, said closure member having edge portions thereof complemental with and fixedly coupled to respective edge portions of said arcuate member so that said arcuate and said closure member define a concavity adapted to receive the head of a wearer, said core comprising closed cell foam material having a thickness of about ⅜ to about 1 inch, said core having thereon a plurality of spaced holes therethrough distributed over the surface of said core to facilitate ventilation of said concavity, and said core having a plurality of slits therethrough, said slits being disposed between said holes to facilitate conformity of said core to the shape of the head of a user and to further facilitate ventilation of said concavity, at least some of said slits being arranged as nested generally parallel curves and at least some of said holes being disposed in arcuate rows disposed in the direction of said curves.

5,461,731

SHIELD PLATE MOUNTING STRUCTURE IN HELMET

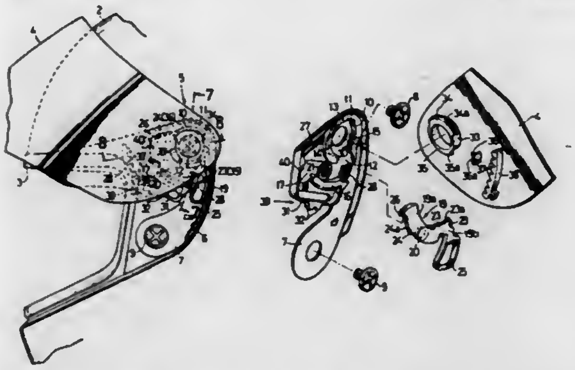
Masayuki Shida, Tokyo, Japan, assignor to Shei Kako Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 16, 1994, Ser. No. 260,823

Claims priority, application Japan, Jun. 18, 1993, 5-147973

Int. Cl.^{6} A42B *3/02*

U.S. Cl. 2—424 **6 Claims**



1. A shield plate mounting structure in a helmet for turnably mounting a shield plate to a mounting base plate secured to an outer side surface of a cap body for opening and closing a window in the cap body, comprising

a support sleeve provided at a peripheral wall thereof with a first notch, and at an inner peripheral surface thereof with a first guide groove,

an arcuate guide projection wall disposed concentrically with and outside said support sleeve and provided at a peripheral wall thereof with a second notch, and at an outer peripheral surface thereof with a second guide groove, both of said support sleeve and the arcuate guide projection wall being formed on an outer side surface of said mounting base plate,

a pivot shaft capable of loosely fitting into said support sleeve,

a first engage claw projecting from an outer peripheral surface of said pivot shaft and capable of engaging with said first guide groove through said first notch,

a second engage claw capable engaging with said second guide groove thorough said second notch, said pivot shaft and said first and second engage claws being formed on an inner side surface of an end of said shield plate,

a lock lever pivotally supported on said mounting base plate for swinging movement between a locking position and an unlocking position and provided with first and second lock claws capable of being brought into and out of engagement with said first and second engage claws within said first and second notches, respectively, in accordance with the locking and unlocking positions of said lock lever, and

a lock spring connected to said lock lever for biasing said lock lever toward the locking position.

5,461,732

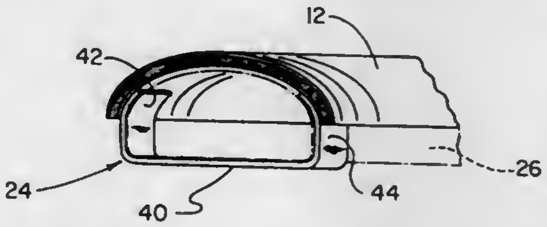
TOILET SEAT COVER

Cassandra A. Reiman, 3239 N. Octavia Dr., Chicago, Ill. 60634

Filed Sep. 2, 1994, Ser. No. 299,962

Int. Cl.^{6} A47K *13/14*

U.S. Cl. 41—245.3 **5 Claims**



1. A toilet seat cover comprising:

an elliptical pad including opposed contoured sides connected by a contoured front end and a straight rear end having a pair of angled corners positioned at opposed ends of the straight rear end, said elliptical pad further including a contoured center aperture extending through a center thereof, with said straight rear end of said elliptical pad being operable to abuttingly engage a toilet tank of said toilet to impart rotational stability to the elliptical pad relative to said toilet such that said angled corners engage said toilet tank to orient said elliptical pad so as to project substantially orthogonally from said toilet tank and along said toilet seat, the elliptical pad being shaped so as to define a convex upper surface spaced from a concave lower surface, said concave lower surface being shaped so as to substantially follow a contour of said toilet seat;

a securing strap means comprised of a single elastic strap, with a first end of said elastic strap being coupled to an outer perimeter of said concave lower surface of said elliptical pad, and a second end of said single elastic strap being coupled to an inner perimeter of said lower surface, whereby said elastic strap can be positioned over said toilet seat by sliding said elastic strap onto said seat through a forward center front aperture of said toilet seat.

5,461,733

LIFTING DEVICE FOR A COVER AND SEAT ON A BOWL OF A TOILET

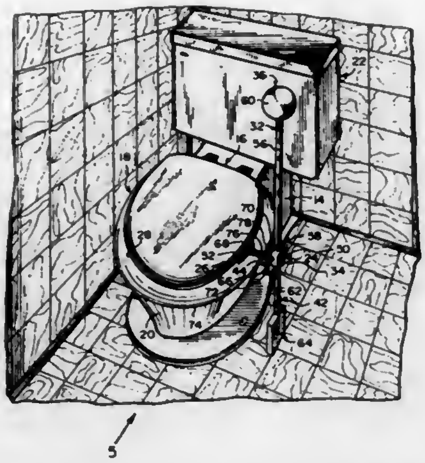
Eric McKee, 103 Bayberry Rd., Newport, N.C. 28570

Filed Aug. 10, 1994, Ser. No. 288,569

Int. Cl.^{6} A47K *13/10*

U.S. Cl. 4—246.1 **3 Claims**

1. A lifting device for a cover and seat on a bowl of a toilet comprising:



a) a pivot pin, said pivot pin includes a shank having a point at one end and an enlarged head at an opposite end;
b) means connectable to the bottom surface of the cover at a side edge thereof, for extending horizontally said pivot pin away from the side edge of the cover, said pivot pin extending means is a mounting plate having a side bore to receive said pointed end of said pivot pin therein;
c) a handle, said handle is an elongated tube;
d) means at a bottom end of said handle, for coupling said handle to said pivot pin in a rotatable manner, said coupling means is a connector in which said pivot pin extends transversely therethrough;
e) a hand grip on a distal free end of said handle, so that a hand of a person can grasp said hand grip and pull upwards to lift the cover of the toilet up, said hand grip is a ball secured to said elongated tube;
f) means on said coupling means for always keeping vertical said handle on said coupling means, said handle vertical keeping means including an arm extending downwardly from said connector, and a counterweight on a distal free end of said arm;
g) means for selectively contacting the seat of the toilet, so as to lift up simultaneously the seat and the cover of the toilet.

5,461,734

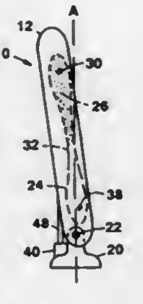
AUTOMATIC TOILET SEAT LOWERING

D. Michael Faircloth, P.O. Box 402412, 4580 Post Ave., Miami Beach, Fla. 33140

Filed Oct. 12, 1994, Ser. No. 321,725

Int. Cl.⁶ A47K *13/10;13/12*

U.S. Cl. 4—246.1 **22 Claims**



1. A toilet seat assembly for automatically closing a toilet seat, comprising:

a mount for attachment of said toilet seat to a conventional toilet bowl,

said toilet seat rotatably connected to said mount for movement between a first upright position and a lowered position,

a chamber integrally associated with said toilet seat for providing said toilet seat with an adjustable center of gravity,

said chamber containing a movable mass,

said mass moving in response to the force of gravity acting thereon resulting in the movement of the center of gravity of said toilet seat from a first non-closing position to a second closing position causing said toilet seat to automatically rotate about said mount from said first upright position to said lowered position.

5,461,735

BED OR COT STRUCTURE WHICH CAN BE RETRACTED INTO A CEILING

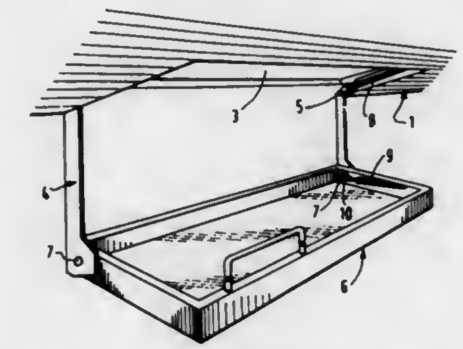
Jean-louis Danton, Boulogne, France, assignor to Establissments Compin, Paris, France

Filed Jun. 24, 1994, Ser. No. 265,204

Claims priority, application France, Jun. 25, 1993, 93 07772

Int. Cl.⁶ A47C *17/38*

U.S. Cl. 5—10.2 **3 Claims**



1. A bed or cot structure which can be retracted into a recess in a ceiling, comprising:

a support, forming a support for said bed or cot, mounted at a first end thereof to at least one inner wall of said recess, said support being articulatable about a first pivot axis between a first support position and a second support position, in which first support position the support is retracted within said recess, and in which second support position the support projects outside the recess;

a frame of said bed or cot, said frame being pivotally coupled to a second end of said support such that the bed or cot may be articulated about a second pivot axis between a first frame position in which first frame position the bed is pressed against said support, and a second frame position in which said the bed or cot is in a position of use;

at least one ram for controlling the articulation of said support, said ram being capable of articulating the support between said first and second support positions, wherein a piston and a driving portion of said at least one ram are offset with respect to said first pivot axis; and

means for controlling the articulation of said frame, said second means being capable of articulating the frame between said first and second frame positions.

5,461,736

PORTABLE HYDRAULIC LIFT STEP STOOL FOR RAISING HANDICAPPED PATIENTS TO AN ELEVATED LOCATION

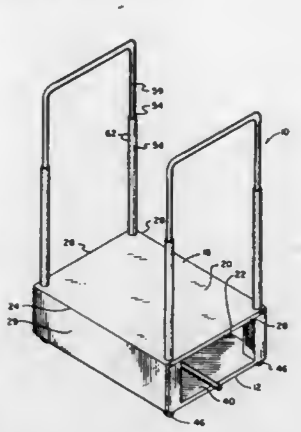
Joyce A. Carpenter, P.O. Box 124, Oxford Junction, Iowa 52323-0124, and Merlin L. Conklin, P.O. Box 2033, Cleveland, Tex. 77328-2033

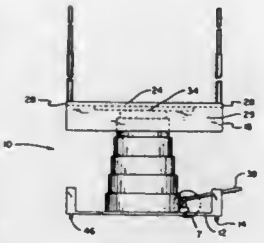
Filed May 13, 1994, Ser. No. 242,423

Int. Cl.⁶ A61G *7/053;7/10*

U.S. Cl. 5—81.1 **1 Claim**

1. A new and improved portable hydraulic lift step stool for raising handicapped patients to an elevated location comprising, in combination:





a lower base positionable upon a floor, the lower base having parallel corner walls extending upwardly therefrom;

an upper base having a planar surface, the upper surface of which is adapted to support a patient to be lifted and transported, the lower surface of which faces the lower base, the upper base having front and rear edges with a downwardly extending plate adapted to be positioned between the upwardly extending corner walls of the lower base;

a hydraulic jack having an upper end secured to the lower surface of the upper base and having a lower end secured to the upper surface of the lower base, the hydraulic jack including a handle extending outwardly from the upper base and lower base in a space between the corner walls of the lower base, the handle adapted to be pumped to raise and lower the hydraulic jack, the jack also having a switch for reversing the direction of movement of the jack;

wheels depending from each corner of the lower base with an associated spring adapted to cushion the motion of the system when rolled from one location to the other; and

a pair of inverted U-shaped handles extending upwardly from the side edges of the upper base, each handle including lower fixed components with vertically spaced apertures and an upper inverted U-shaped component with downwardly extending free ends positionable in the upper apertures of the lower components each with a locking tongue for securing the upper component at a fixed elevation with respect to the lower component.

5,461,737
MATTRESS APPARATUS AND METHOD FOR MANUFACTURING THE SAME

Shigeru Ikeda, Kunitachi, and Yoshio Oguma, Tokyo, both of, Japan, assignors to France Bed Co., Ltd., Tokyo, Japan

Filed Oct. 6, 1993, Ser. No. 132,468

Claims priority, application Japan, Feb. 16, 1993, 5-026968; Mar. 12, 1993, 5-052510

Int. Cl.^{6} A47C *27/045*

U.S. Cl. 5—475 **13 Claims**

1. A mattress apparatus comprising:

a spring unit having upper and lower sides;

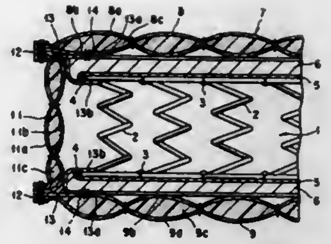
a pad arranged at least on the upper side of the spring unit to provide a laminate structure with the spring unit;

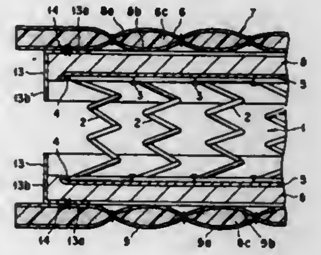
an outer cover body having;

a top layer covering at least an upper surface of the laminate structure;

and a side layer covering an outer peripheral area of the laminate structure; and

a joining member made of a heat-shrinkable synthetic resin sheet material, the joining member having one end width portion which is joined to an inner surface of the top layer of the outer cover body and, upon being heat shrunk, the joining member immovably holding the pad and outer cover body relative to the spring unit under its shrinking force.





5,461,738
BED SYSTEM WITH EXCRETING MECHANISM

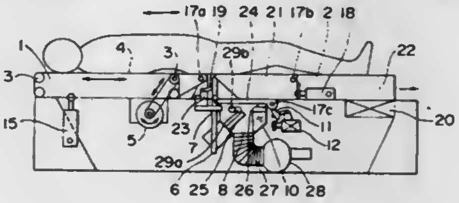
Motoyasu Kimura, and Tomoe Kimura, both of Tokyo, Japan, assignors to Kimura Industry Co., Ltd., Tokyo, Japan

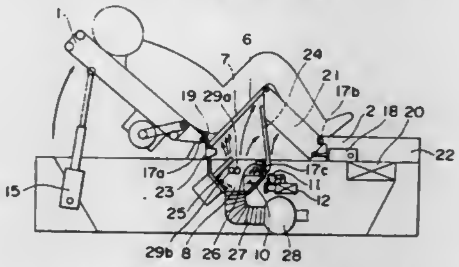
Filed Feb. 25, 1993, Ser. No. 22,371

Claims priority, application Japan, Feb. 28, 1992, 4-043686; Sep. 24, 1992, 4-255119

Int. Cl.^{6} A61G *7/02*

U.S. Cl. 5—604 **8 Claims**





1. A bed system with an excreting mechanism for use by a patient and operable with a bed sheet comprising:

a front base for receiving the upper half of a patient's body, said front base having front and rear peripheral portions and side portions and capable of having its front portion tilted upward being tilted up;

a rear base for receiving the lower half of said patient's body, said rear base having a front peripheral portion and being movable forward and backward and having a front portion capable of being tilted up;

a posture regulating mechanism comprising at least a pair of rollers provided in said front peripheral portion of said front base and said rear peripheral portion of said front base, respectively; said bed sheet being stretched between said rollers and capable of being moved forward and backward by rotation of said rollers;

a roller drive means for driving said rollers;

a pot seat provided at an opening portion between said rear peripheral portion of said front base and said front peripheral portion of said rear base when said front base is tilted up and said rear base is moved backward and said front portion of said rear base is tilted upward; and a chamber pot disposed under said pot seat in such a manner that the upper surface thereof is opened and closed when said front portion of said rear base is tilted up or down respectively.

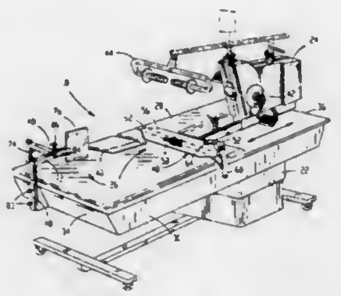
5,461,739
PATIENT MIDSECTION AND SHOULDER SUPPORT APPARATUS FOR TILTING EXAMINATION TABLE

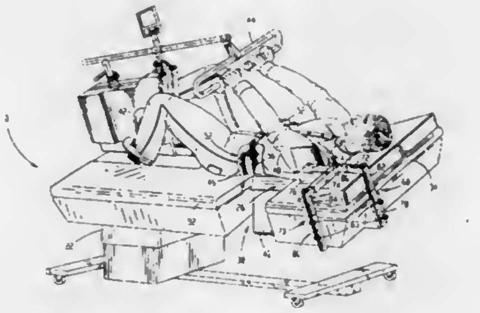
Michael G. Falbo, Sr., Gladstone, Mo., assignor to American Echo, Inc., Kansas City, Mo.

Filed Jul. 25, 1994, Ser. No. 280,223

Int. Cl.⁶ A61G *7/008;7/05;7/07*

U.S. Cl. 5—607 **5 Claims**





4. A diagnostic patient support bed, comprising:

an elongated, generally horizontally disposed bed presenting an uppermost bed surface, a pair of elongated, laterally spaced apart first and second side margins, and a pair of axially spaced, transversely extending end margins;

tilting means for tilting said bed so that said first side margin is at a higher elevation than said second side margin; and

structure defining a first opening in said bed surface and respectively adjacent said first side margin,

said first opening being located and sized for permitting sonographic diagnosis of a patient lying on said bed surface;

a first bed filler section sized to substantially fill said first opening; and

support means for supporting the patient on the tilted bed, said support means including

a flexible patient support sling adapted to circumferentially surround the patient's midsection,

said sling presenting first and second belt ends, wherein said first belt end is fixedly attached to said bed first side margin and includes a retractable belt attached thereto, and said second belt end initially overlies said bed second side margin, wherein said first and second ends are adapted to wrap around the patient's midsection so that said support sling engages the patient's entire midsection, and

an adjustable shoulder support apparatus adapted to engage the patient's shoulder while said bed is tilted.

5. The support bed of claim **4** further including an exercise apparatus coupled with said bed.

5,461,740
MULTI-POSITIONAL BED

Stephen Pearson, Warminster, United Kingdom, assignor to Theraposture Limited, Warminster, United Kingdom

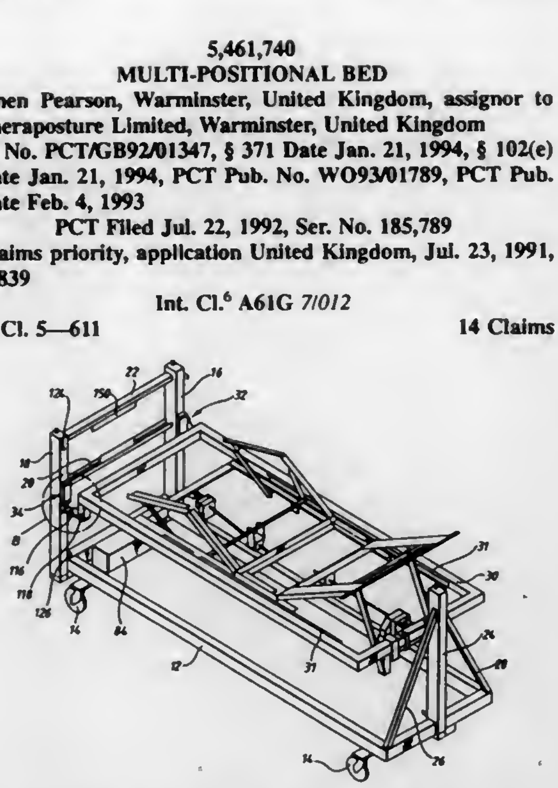
PCT No. PCT/GB92/01347, § 371 Date Jan. 21, 1994, § 102(e) Date Jan. 21, 1994, PCT Pub. No. WO93/01789, PCT Pub. Date Feb. 4, 1993

PCT Filed Jul. 22, 1992, Ser. No. 185,789

Claims priority, application United Kingdom, Jul. 23, 1991, 9115839

Int. Cl.⁶ A61G *7/012*

U.S. Cl. 5—611 **14 Claims**



1. A multi-positional bed which comprises at one end thereof a pair of pillars, one at or near each side of the bed, and at the opposite end a single pillar situated substantially on the longitudinal centre line of the bed, a user-supporting frame, and respective mounting means for mounting the frame to each of the pillars, each mounting means being arranged to move lengthwise of the respective pillar independently of the movement of the other mounting means.

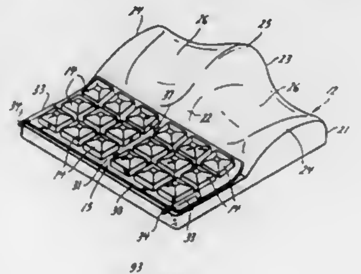
5,461,741
MODULAR CUSHION CONSTRUCTION WITH FOAMED BASE

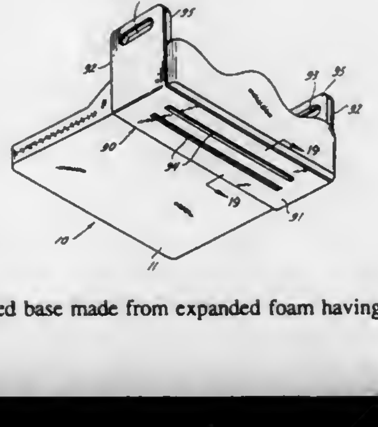
Robert H. Graebe, St. Clair County, Ill.

Division of Ser. No. 53,551, Apr. 27, 1993, abandoned, which is a continuation of Ser. No. 839,305, Feb. 20, 1992, abandoned. This application Oct. 31, 1994, Ser. No. 332,934

Int. Cl.⁶ A47C *27/18;27/10;* **A61G** *7/057*

U.S. Cl. 5—654 **36 Claims**





1. A shaped base made from expanded foam having

(a) a substantially flat rear portion to accommodate a pad for supporting the buttocks of a user,

(b) a raised front portion having a central pommel to separate the legs and side edges which define curved depressed leg areas adjacent to the pommel to place loads on the legs of the user, the depressed leg areas being angularly inclined in a diverging direction toward the front of the base to position the user, and

(c) an angularly inclined stepdown section connecting the flat rear portion and the raised front portion to provide a transition which minimizes deformation of the soft tissues of the user which are positioned above this part of the base,

(d) said rear portion extending from the back edge of the base to the stepdown section and completely across the base from side-to-side, said rear portion being of substantially uniform thickness throughout.

30. The combination of

(a) a user supporting base having a top user supporting surface, a bottom, and side walls connecting the user supporting surface to the bottom, and

(b) a U-shaped member having upstanding side walls and a bottom wall connecting one end of each of the side walls, said U-shaped member adapted to be positioned beneath and along the sides of said user supporting base, whereby the side members project above the user supporting surface to assist in retaining the user of the base on the base.

5,461,742

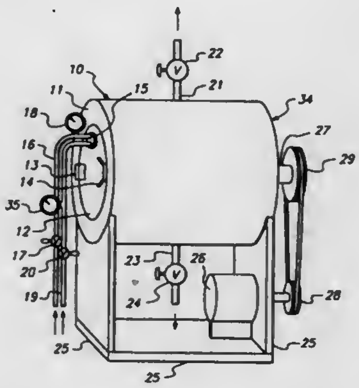
MIST TREATMENT OF GARMENTS

Dilip Pasad, and Frank Garcia, both of El Paso, Tex., assignors to Levi Strauss & Co., San Francisco, Calif.

Filed Feb. 16, 1994, Ser. No. 198,195

Int. Cl.^{6} D06B *3/30*

U.S. Cl. 8—149.2 **20 Claims**



1. A method for applying a textile treatment agent to garments or garment work pieces using an apparatus having a substantially liquid impermeable housing, a means for tumbling garments placed in the housing, a stationary nozzle means mounted in said housing for creating a fog of textile treatment agent, a gas conduit for communicating a propellant gas from a gas source to said nozzle means, a liquid conduit for communicating the liquid textile treatment agent under pressure from a reservoir to said nozzle means, said method comprising the steps of:

tumbling garments in the liquid impermeable housing; and

causing gas to flow through the gas conduit to the nozzle under pressure, and causing a predetermined quantity of liquid textile treatment agent to flow through the liquid conduit to the nozzle under pressure, to create in the housing a fog of the textile treatment agent, whereby as said garments or garment work pieces are tumbled through said textile treatment agent fog they dissipate the fog by substantially uniformly absorbing substantially all of said textile treatment agent.

5,461,743

METHODS AND APPARATUSES FOR MOUNTING MULTIPLE-STRAND STAYS OF BRIDGES

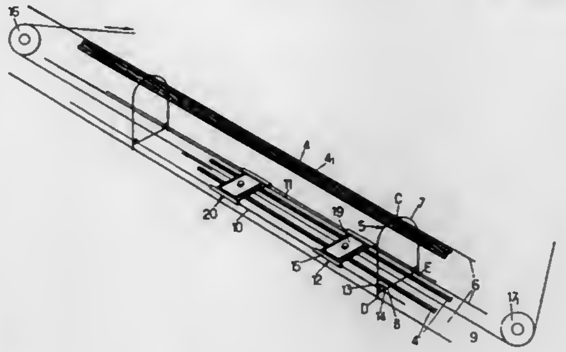
Jérôme Stubler, Paris, and Raymond Chastagnol, Epernon, both of, France, assignors to Freyssinet International et Cie, Velizy, France

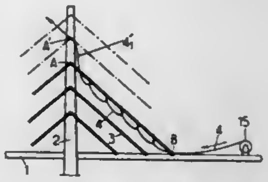
Filed Mar. 17, 1994, Ser. No. 214,255

Claims priority, application France, Mar. 18, 1993, 93 03146

Int. Cl.^{6} E01D *11/00*

U.S. Cl. 14—22 **10 Claims**





1. A method of mounting a multiple strand stay of a stayed bridge between a tower and the deck of said bridge, the method being characterized in that the stay is built up directly, strand by strand, in its final oblique position by performing the following sequence or steps: installing one of the strands for making up the stay in its final oblique position, this stage of installation being terminated by putting the strand under tension and anchoring its ends respectively to the tower and to the deck; suspending a guide cage for the following strands from said first strand installed in this way, the cage extending over the entire length of said strand and being made up of a sequence of rigid hoops interconnected by strings, said cage surrounding said first strand and also surrounding a traction cable; pulling up the subsequent strands making up the stay successively inside the cage by means of said cable; after each strand has been pulled up, putting each strand under tension so that it bears laterally against the already-installed strand or set of strands, and its ends are anchored respectively to the tower and the deck; and after all of the strands have been installed, removing the guide cage from the completed stay.

5,461,744

DENTAL DEVICE ATTACHABLE TO AN ELECTRIC TOOTHBRUSH DRIVE

Lothar Merbach, Frankfurt, Germany, assignor to Rowenta-Werke GmbH, Offenbach am Main, Germany

PCT No. PCT/DE94/00264, § 371 Date Nov. 18, 1994, § 102(e) Date Nov. 18, 1994, PCT Pub. No. WO94/21193, PCT Pub. Date Sep. 29, 1994

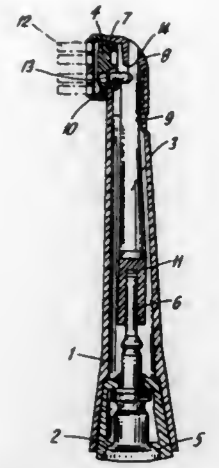
PCT Filed Mar. 12, 1994, Ser. No. 338,621

Claims priority, application Germany, Mar. 20, 1993, 9304184 U

Int. Cl.^{6} A61C *17/32;* **A46B** *13/02*

U.S. Cl. 15—22.1 **4 Claims**

1. A dental device for an electric toothbrush drive having a drive shaft which undergoes movement having axial and radial components, comprising: a housing; motion converter means arranged in the housing and including a rocker arm, a rotary oscillation plate having an eccentrically arranged plug-in opening, and a plug-in axle for operatively connecting the rotary oscillation plate to the



rocker arm via the plug-in opening; guide means for releasably and operatively connecting one end of the rocker arm to the drive shaft of the toothbrush drive; and bearing means for rotatably supporting the rotary oscillating plate at the housing, the motion converter means converting the movement of the drive shaft into rotational oscillatory movement of the rotary oscillation plate about the plug-in axle.

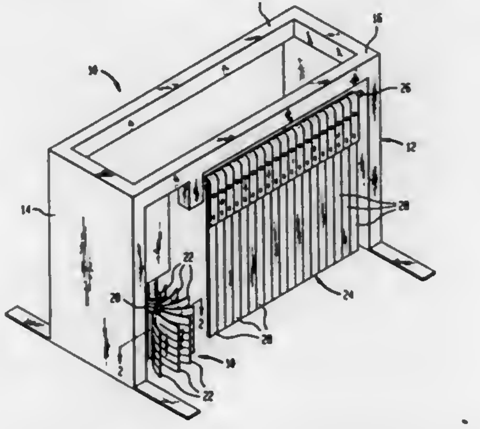
5,461,745
AUTOMATIC VEHICLE WASHING APPARATUS

Frank J. Nittoli, Rahway, N.J., assignor to Advance Car Wash Equipment, Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 276,104, Jul. 15, 1994, Pat. No. 5,410,770. This application Nov. 10, 1994, Ser. No. 337,063

Int. Cl.⁶ B60S *3/06;3/04*

U.S. Cl. 15—97.3 **18 Claims**



1. A curtain assembly for a vehicle washing apparatus, comprising a plurality of elongated curtain elements, each curtain element having a free end engageable with a vehicle passing through said curtain assembly; and mounting means for removably mounting said curtain elements on an oscillating drum such that said curtain elements are arranged in rows with said free ends thereof remote from said oscillating drum, each row having at least a pair of side-by-side curtain elements, said mounting means including adjusting means for selectively and incrementally adjusting the position of said free ends of said curtain elements relative to said oscillating drum, whereby the position of each individual curtain element relative to said oscillating drum can be adjusted independently of the other curtain elements to compensate for wear at its free end.

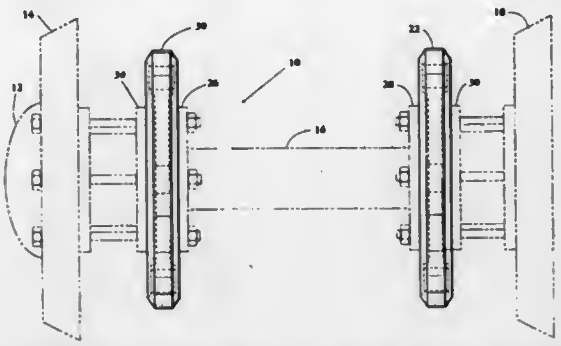
5,461,746
MAGNETIC CLEANING PIG

Niranjan Banik, Tulsa; Harry M. Land, Owasso, and Edward W. Levy, Jennings, all of Okla., assignors to TDW Delaware, Inc., Wilmington, Del.

Filed Jan. 17, 1995, Ser. No. 373,554

Int. Cl.⁶ B08B *9/04*

U.S. Cl. 15—104.061 **13 Claims**



1. A magnetic cleaning device for passing through a pipeline having a cylindrical internal wall, which device comprises:

a. at least one flexible disc body or cup body for engaging said internal wall of said pipeline;

b. at least one flexible magnetic disc perpendicular to said cylindrical wall axis, each said magnetic disc having a plurality of radially spaced openings therethrough;

c. a magnet received in each said opening, said magnets having poles oriented axially with the cylindrical axis of said cylindrical wall;

d. opposed magnetic retainer platens on each side of each said magnet to retain each magnet in said magnet disc and to extend the magnetic field of action; and

e. means to fasten said opposed retainer platens to said magnetic disc.

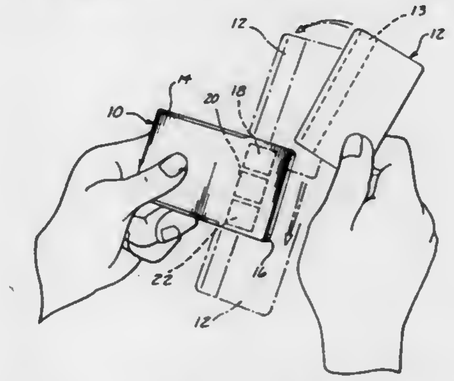
5,461,747
DATA CARD CLEANER

Eivind Clausen, Bellingham, Wash., and Ketil Fridheim, Oslo, Norway, assignors to Allsop, Inc., Bellingham, Wash.

Filed May 19, 1994, Ser. No. 246,038

Int. Cl.⁶ A47L *25/00*

U.S. Cl. 15—104.94 **20 Claims**



1. A device for cleaning data-bearing cards comprising:

(a) a housing including an elongated guide channel adapted to receive an edge of the card to be cleaned, said guide channel having a first side to oppose a data-beating portion of the card and a second side opposite the first side, said first and second sides each being spaced apart to define said guide channel, said guide channel being open at the ends and a top of the channel and further including a forwardly facing abutment surface at a bottom of the channel opposite the top on which an edge of the data bearing card engages and slides to properly position the card for cleaning when inserted into said guide channel;

(b) a cleaning fluid applicator disposed within the first side of said guide channel for applying a cleaning solution to the portion of the card that is to be cleaned; and

(c) a scrubber disposed within the first side of said guide channel laterally spaced adjacent said fluid applicator along the length of the guide channel for removing foreign matter from the card.

5,461,748
MAT, MAT WITH NAME AND METHOD FOR ANCHORING NAME SEAL

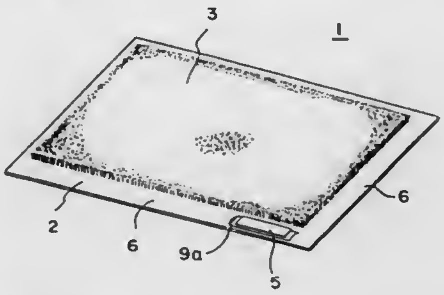
Tomonari Koiduka, Fukuoka, Japan, assignor to Houei Co., Ltd., Fukuoka, Japan

Filed Dec. 27, 1993, Ser. No. 173,093

Claims priority, application Japan, Aug. 30, 1993, 5-239103

Int. Cl.^{6} A47L *23/26;23/22*

U.S. Cl. 15—161 **8 Claims**



5. A mat comprising:

a cured rubber mat main body, said mat main body having an upper surface; and a thermoplastic resin element attached to said mat main body wherein said thermoplastic resin element is formed with an upper surface adapted for anchoring a name seal thereon and said thermoplastic resin element is attached to said mat main body so that said entire upper surface of said thermoplastic resin element is flush with said upper surface of said mat main body.

5,461,749
FLOOR MOP AND CLEANING SYSTEM

Carl S. Ahlberg, Minneapolis; James A. Wilson, North St. Paul, and James R. Harrison, Oakdale, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 31, 1994, Ser. No. 251,618

Int. Cl.^{6} A47L *13/256*

U.S. Cl. 15—228 **20 Claims**

1. A floor mop for cleaning a floor, comprising:

(a) a mop head having a longitudinal leading edge, a longitudinal trailing edge, a first end edge and an opposing second end edge, a first cleaning support surface and an opposing second cleaning support surface;

(b) a flexible cleaning sheet having a first cleaning surface and an opposing second cleaning surface and an attachment edge;

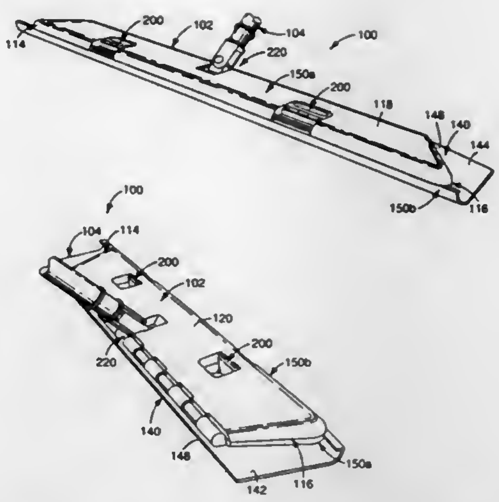
(c) securing means for releasably attaching a portion of said cleaning sheet to the mop head adjacent to and parallel to said attachment edge of said cleaning sheet, leaving a major portion of said cleaning sheet free;

(d) a handle member adapted for manual engagement; and

(e) means for universally pivotally connecting said handle member to said mop head enabling said mop head to be shifted by manipulating said handle member between

a first position wherein said first cleaning support surface of said mop head is presented to the floor with said cleaning sheet interposed between said first cleaning support surface and the floor and said free portion of said cleaning sheet extending from said securing means so as to present said first cleaning surface of said cleaning sheet to encounter the floor as the mop head is moved in relation thereto,

a second position wherein said second cleaning support surface of said mop head is presented to the floor with said cleaning sheet interposed between said second cleaning support surface and the floor and said free portion of said cleaning sheet extending from said securing means so as to present said second cleaning surface of said cleaning sheet to encounter the floor as the mop head is moved in relation thereto.



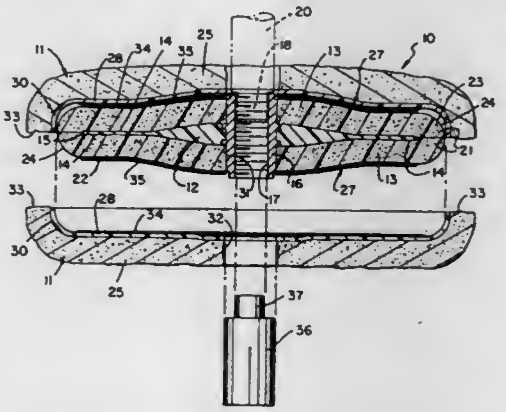
5,461,750
DOUBLE CURVED BACKING PLATE WITH CUSHIONED SUPPORT FOR ROTARY BUFFING PADS

Richard A. Kaiser, N84 W28518 Center Oak Rd., Hartland, Wis. 53029

Filed Feb. 2, 1995, Ser. No. 382,626

Int. Cl.^{6} B24D *13/14*

U.S. Cl. 15—230 **8 Claims**



1. In a rotary buffing pad assembly for demountable attachment to the rotary shaft of a power buffer, said assembly including a rigid annular backing plate having opposite faces, each face extending between a circular outer edge and a central hub for attachment to the buffer shaft, and a buffing pad operatively attached to each face of said backing plate, each pad including a stiff annular inner backing member providing an attachment interface and an outer buffing medium fixed to the backing member, each annular backing member having a dish-shape defined by a generally flat circular body and a curved peripheral edge which edge causes the adjacent edge portion of the buffing medium to

assume a curved shape corresponding to said curved peripheral edge, the improvement comprising:

a flexible circular cushioning member attached to the backing plate, said cushioning member having opposite face portions and an outer edge portion enclosing respectively the opposite faces and the outer edge of the backing plate, said face portions providing the attachment interface for the buffing pads, and the outer edge portion of said cushioning member having a rounded peripheral outer edge surface defining a smooth transition between said opposite face portions, said outer edge surface conforming to and providing cushioned support for the curved peripheral edges of the backing members;

whereby attachment of the backing members to the respective face portions of the cushioning member places the curved peripheral edges of the backing members in juxtaposition and causes the adjacent edge portions of the respective buffing media to enclose said cushioning member.

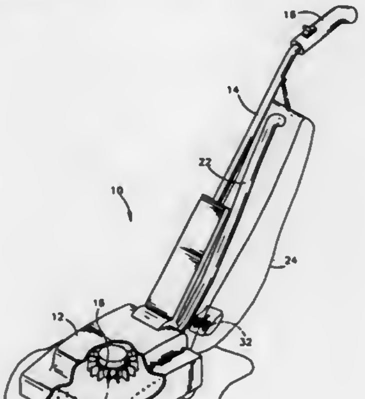
5,461,751
CEDAR AIR FRESHENER FOR VACUUM CLEANER BAGS

Arnold L. Sepke, Hudson, Ill., assignor to White Consolidated Industries, Inc., Cleveland, Ohio

Filed Feb. 3, 1994, Ser. No. 190,853

Int. Cl.^{6} B01D *46/02*

U.S. Cl. 15—246.3 **6 Claims**



4. A vacuum cleaner, comprising:

an intake nozzle;

a receptacle;

a dirt lifting means for creating a flow from the nozzle to the receptacle so as to carry dirt from the nozzle into the receptacle;

cedar chips; and

a closed porous sack containing the cedar chips and contained in the receptacle.

5,461,752
PAINT TRAY ASSEMBLY, FOR MOUNTING ON EITHER ONE OF THE UPRIGHTS OF A LADDER

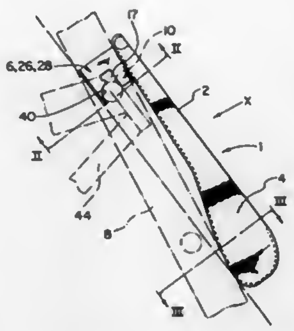
Francis W. Lemon, 67 First Avenue, Brockville, Ontario, Canada, and Julian D. Lamb, 11 Halliday Street, Brockville, Ontario, Canada

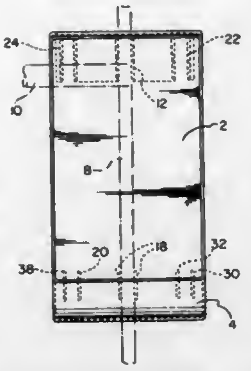
Filed Oct. 11, 1994, Ser. No. 320,529

Int. Cl.^{6} B44D *3/12*

U.S. Cl. 15—257.06 **6 Claims**

1. A paint tray assembly for mounting on either one of the uprights of a ladder, said paint tray assembly comprising,





a) an upper, paint draining portion which is downwardly inlined when the assembly is mounted on a ladder upright,

b) a lower, open-topped paint container portion integral with the draining portion and for having a paint applicator dipped therein, and

c) mounting means for removably mounting the paint tray assembly on a ladder upright in a slidable manner therealong, while restraining the upper and lower portions against lateral movement relative to that upright, the mounting means, in operation, supporting the upper and lower portions in a downwardly inclined position by hooking over a ladder rung, the mounting means comprising a bracket assembly on an underside of the draining portion, the bracket assembly being located centrally on the underside of the draining portion between opposite lateral side portions thereof for mounting the tray assembly centrally over either one of the upright of a ladder while locating on a portion of a ladder rung adjacent to that uprights.

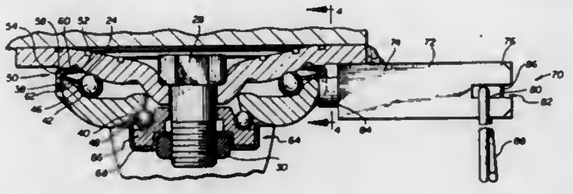
5,461,753
SEAL FOR SWIVEL CASTER ASSEMBLY

Allan Rounds, North Adams, Mich., assignor to Albion Industries, Inc., Albion, Mich.

Filed Oct. 22, 1993, Ser. No. 140,756

Int. Cl.^{6} B60B *33/02*

U.S. Cl. 16—21 **2 Claims**



1. A swivel caster assembly comprising:

a top plate having upper and lower faces;

a wheel assembly rotatably attached to the top plate, wherein the wheel assembly comprises a notched swivel element having upper and lower faces, a first ball bearing set between the lower face of the top plate and the upper face of the swivel element, an annular seal with interior and exterior perimeters with embossments on the exterior perimeter that engage the swivel element notches, the seal further including a V-shaped cross section defining two seal legs joined at a bight, the bight being located radially outward of the seal legs so that the seal opens radially inward toward the first ball bearing set, the seal being located between the lower face of the top plate and the upper face of the swivel element and adjacent to but radially outward of the first ball bearing set, the seal having embossments to mate with the swivel plate notches so that the seal will move conjointly with the swivel plate, a second ball bearing set below the lower face of the swivel element and within a cap assembly rigidly attached to the top plate, and wheel assembly legs extending distally from the lower face of the swivel element to engage a wheel mounted to an axle for rotation.

5,461,754

DOOR CLOSER WITH A DETENT FOR HOLDING A DOOR OPEN AND THE DETENT THEREFOR

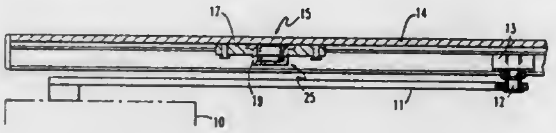
Horst Tillmann; Dietrich Jentsch, both of Ennepetal; Thomas Hering, Wetter; Thomas Warschewitz, Enneptal; Dieter Sichelschmidt, Herdecke, and Bernd Winkler, Breckerfeld, all of, Germany, assignors to DORMA GmbH + Co. KG, Ennepetal, Germany

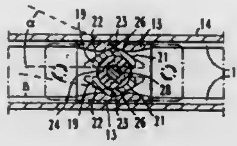
Division of Ser. No. 931,281, Aug. 17, 1992, Pat. No. 5,311,642. This application Dec. 15, 1993, Ser. No. 168,528

The portion of the term of this patent subsequent to May 17, 2011, has been disclaimed.

Int. Cl.⁶ E05F *5/02*

U.S. Cl. 16—82 **19 Claims**





1. Detent apparatus for holding a door in a selected open position relative to a door mounting frame, the door having a hinge axis for pivoting of the door thereabout, said detent apparatus comprising:

a guide rail affixable to a member of the door mounting frame which is perpendicular to a plane passing through a hinge axis of a door, the guide rail having a longitudinal dimension for being disposed parallel to a longitudinal axis of the frame member;

a guide element for being guided along said guide rail along a path of movement along the longitudinal dimension of said guide rail;

said guide rail and said guide element each being configured for permitting substantially unobstructed movement of said guide element along a substantial portion of said guide rail;

an arm having a first end and a second end, said first end of said arm comprising means for being pivotably connected to said guide element, and said second end of said arm comprising means for being pivotably connected to a door at a point spaced apart from a hinge axis of the door;

a detent member for being disposed along said guide rail, said detent member being movable along said guide rail, and said detent member being selectively positionable at at least two separate positions disposed a substantial distance from one another along said guide rail;

said detent member comprising means for retaining said detent member in a selected one of the at least two separate positions along said guide rail, said selected position of said detent member determining said selected open position of the door;

said guide element and said detent member comprising, in combination, detent means, said detent means comprising first and second detent means portions:

said first detent means portion comprising a catch portion disposed on one of said guide element and said detent member, and said second detent means portion comprising a corresponding projection on at least the other of said guide element and said detent member for being retained by said catch portion;

said detent means comprising means for urging at least one of said catch portion and said corresponding projection into a detent relationship with one another;

said detent member comprising means for disposing said detent means portion of said detent member in the path of said guide element for engaging said detent means portion of said guide element with said detent means portion of said detent member as said guide element moves along the guide rail; and

said means for urging being substantially resilient for permitting engagement of said catch portion and said corresponding projection, and said means for urging having sufficient rigidity for maintaining engagement of said catch portion and said corresponding projection in the absence of external forces applied to the door.

5,461,755

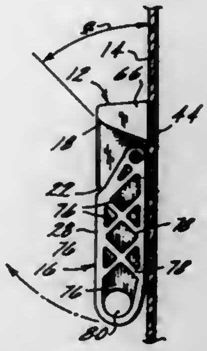
LIGHTWEIGHT HANDLE

James S. Hardigg, Conway, and Rene R. Aponte, Chicopee, both of Mass., assignors to Hardigg Industries, Inc., South Deerfield, Mass.

Filed Nov. 23, 1993, Ser. No. 155,806

Int. Cl.⁶ B65D *25/28*

U.S. Cl. 16—112 **7 Claims**



1. A handle assembly disposed on a container wall for lifting and transporting said container, the handle assembly comprising:

a stationary bracket member affixed to the container wall, said bracket member having inner and outer portions;

a movable handle member comprising a hand grip portion and first and second arms extending from said hand grip portion, each of said first and second arms including an outer portion and a pivot portion substantially parallel to said hand grip portion, each of said pivot portions being rotatable within said inner portion of said stationary bracket member so that said movable handle member may be pivoted between a first position and a second position;

first and second stationary stop members disposed on the outer portion of said stationary bracket member; and

first and second movable stop members disposed on the outer portion of said first and second arms of said movable handle;

each of said stationary stop members and movable stop members having a substantially planar contact surface which come into contact when said movable handle is pivoted from its first position to its second position so as to limit said pivotal movement of said movable handle;

said planar contact surfaces of said movable handle and said stationary bracket being disposed at an angle of about 45 degrees with respect to the container wall when in contact with one another whereby said movable handle is positioned approximately 90 degrees with respect to said container wall.

5,461,756

RETRACTABLE LUGGAGE HANDLE RELEASE CONTROL AND INNER TUBE POSITIONING ARRANGEMENT

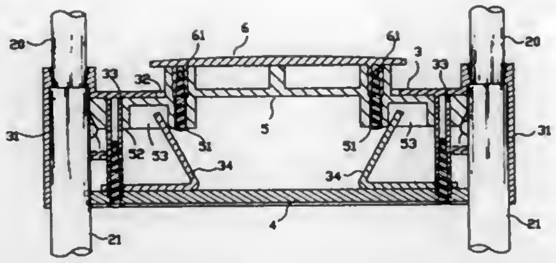
King-Sheng Wang, No. 569, Ching Kuo Rd., Ta Chia Chin, Taichung Hsien, Taiwan, Prov. of China

Filed Aug. 23, 1994, Ser. No. 294,505

Int. Cl.⁶ B25G *1/04*

U.S. Cl. 16—115 **3 Claims**

1. A retractable luggage handle release control and inner tube positioning arrangement for a retractable luggage handle of the type having two sleeves and two inner tubes moved in the sleeves



and joined by a hand grip outside the sleeves, said inner tubes having a respective spring bolt for inserting into a respective locating hole on each sleeve for permitting said inner tubes to be retained in an operative position extended out of said sleeves, the arrangement comprising a release control mechanism mounted between said sleeves and controlled to force the spring bolts of said inner tubes back inside said sleeves for permitting said inner tubes to be moved from said operative position to a collapsed position received inside said sleeves, and inner tube positioning structure for holding said inner tubes in said collapsed position, wherein:

said release control mechanism comprises:
- a sliding block movably received inside a hollow control block, said sliding block having an inner pair of vertical axle holes and an outer pair of vertical axle holes respectively disposed at different elevations, two opposite bottom chambers, and two bevel ends converging inwardly toward each other;
- said hollow control block fixedly mounted between said sleeves near top ends of said sleeves and covered with a bottom cover, said hollow control block having an elongated top opening and two downward rods respectively inserted through said outer pair of axle holes and perpendicularly fastened to said bottom cover;
- a press bar having two downward rods inserted into the top opening on said control block and fixedly fastened to said inner pair of axle holes; and
- two curved spring plates bilaterally stopped between said bottom cover and said sliding block, each curved spring plate having a horizontal bottom section supported on said bottom cover and fastened to one downward rod of said control block and a sloping top section inserted into one bottom chamber on said sliding bloc;

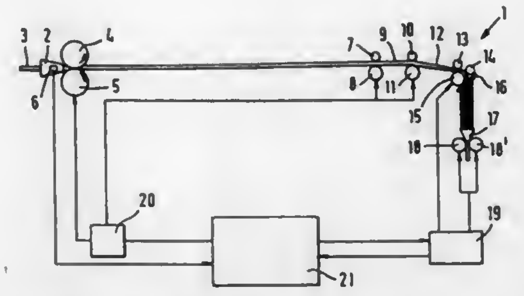
said inner tube positioning structure comprises:
- two first locating elements respectively fastened to said inner tubes at a bottom end;
- two second locating elements respectively fixedly mounted inside said sleeves for receiving said first locating blocks to hold said inner tubes in said collapsed position.

5,461,757

APPARATUS FOR MEASURING THE SLIVER DENSITY AT A TAPERING SLIVER GUIDE IN A DRAFTING FRAME

Ferdinand Leifeld, Kempen, Germany, assignor to Trützschler GmbH & Co. KG, Möchengladbach, Germany
Filed Apr. 4, 1994, Ser. No. 222,792
Claims priority, application Germany, Apr. 2, 1993, 43 10 820.2; Feb. 11, 1994, 44 04 326.0
Int. Cl.^{6} D01H *5/72;5/38*
U.S. Cl. 19—239 **24 Claims**

1. A drafting frame comprising
- (a) drafting means for drafting a plurality of slivers running in an advancing direction and for combining the slivers into a single sliver;
- (b) a sliver guide situated upstream of said drafting means as viewed in said advancing direction; said sliver guide having wall means defining a cavity for guiding therein the plurality of slivers; said wall means converging in said advancing direction for gathering the slivers in a side-by-side orientation in a single plane; said wall means including a counterface;

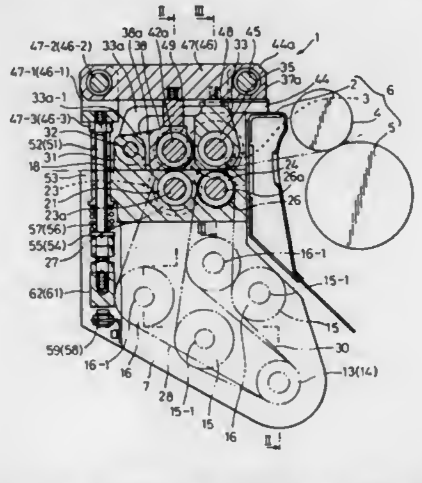


- (c) a sensor element supported for displacement relative to said sliver guide; said sensor element having a sliver-contacting face movable toward and away from said counterface and defining therewith a constriction of said sliver guide;
- (d) force-exerting means exerting a force on said sensor element for urging said sliver-contacting face towards said counterface to consolidate the slivers running through said constriction;
- (e) transducing means coupled to said sensor element for emitting a signal representing excursions of said sensor element in response to thickness fluctuations of the slivers running through said constriction; and
- (f) a pull-off roll pair situated downstream of said sliver guide and upstream of said drafting means; said pull-off roll pair defining a nip between which the slivers pass; said pull-off roll pair pulling said slivers from said sliver guide.

5,461,758

ROLLER DEVICE FOR SENSING AND CONTROLLING UNEVENNESS OF SILVER IN A CARDING MACHINE

Hironori Yasuda, and Katsumoto Yamamoto, both of Inazawa, Japan, assignors to Howa Machinery, Ltd., Nagoya, Japan
Filed Sep. 13, 1994, Ser. No. 304,832
Claims priority, application Japan, Sep. 14, 1993, 5-252505
Int. Cl.^{6} D01H *5/38*
U.S. Cl. 19—239 **9 Claims**



1. A device for controlling unevenness in a carded sliver, which device is located downstream from a sliver delivery part of a carding machine, comprising:
- a first set of a first and a second measuring roller, which measuring rollers are in contact with each other and provide a first nip point adjacent the sliver delivery part;
- a second set of a first and a second drafting roller, which drafting rollers are in contact with each other and provide a second nip point spaced from the first nip point of the first set of rollers;
- at least one of said first and the second measuring rollers in the first set being displaceable with respect to said first nip point;
- a sensor for detecting relative displacement of a measuring roller in the first set to indicate the thickness of a sliver passing through said first nip point and means, responsive to a signal

from the sensor, for obtaining a desired thickness of a sliver from the rollers of the second set;

said first measuring roller in the first set being formed with an annular flange, while the second measuring roller in the first set is formed with an annular groove, which groove is engaged with the annular flange of the first measuring roller,

said first drafting roller in the second set being formed with an annular groove, while the second drafting roller in the second set is formed with an annular flange, which flange is engaged with the annular groove of the first drafting roller, and

said annular groove of the first drafting roller in the second set being engaged with the annular flange of the first measuring roller in the first set, while the annular flange of the second drafting roller in the second set is engaged with the annular groove of the second measuring roller in the first set.

5,461,759

INFORMATION CARRIER FOR CLAMPING ONTO RODS, PARTICULARLY CLOTHES RODS

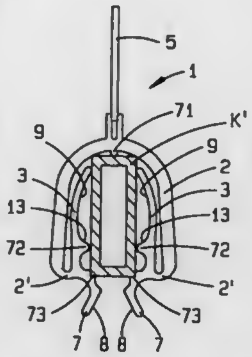
Heinz-Peter Knoop, Solingen, Germany, assignor to Johann Knupp GmbH & Co., Solingen, Germany

Filed May 2, 1994, Ser. No. 236,956

Claims priority, application Germany, May 4, 1993, 9306696 U

Int. Cl.⁶ A44B *21/00;* **F16L** *3/00*

U.S. Cl. 24—555 **13 Claims**



1. An information carrier for clamping on rods and having a holding clamp on the outer surface of said carrier for holding an information placard, and having a holding clamp on the outer surface of said carrier for holding an information placard, the carrier comprising:

two first arms of a spring material forming a substantially c-shaped clamping jaw to receive the rod;

two second arms formed resiliently on respective ones of said first arms, each of said second arms having a concave side surface, each of said second arms extending freely into the clamping jaw and forming, by a part of a region of its concave side surface, an oval holding region for resilient engagement of the rod; and

two spreading jaws extending from end regions of respective ones of said first arms, the spreading jaws having run-on bevels arranged on opposite sides of an opening of the c-shaped clamping jaw defining means for opening said c-shaped clamping jaw.

5,461,760

SLEEVE STRETCHER ASSEMBLY FOR A SPREADER ROLLER

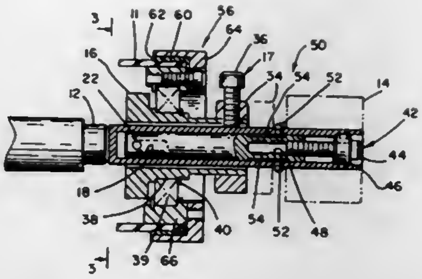
Lawrence R. Damour, Succasunna, N.J., assignor to Converter Accessory Corp., Wind Gap, Pa.

Filed Sep. 13, 1994, Ser. No. 305,203

Int. Cl.⁶ D06C *3/06*

U.S. Cl. 26—99 **10 Claims**

1. A sleeve stretcher assembly for a spreader roller comprising:



(a) a stationary shaft, at least one end of said stationary shaft having a tubular cross section, said stationary shaft further including a transverse aperture therethrough, said transverse aperture being selectively elongated;

(b) a slide rod being sized for slidable movement interior of said tubular cross section, said slidable movement being parallel to an axis of said stationary shaft;

(c) a hub member having an inside portion, and an outer peripheral portion, said hub member being pivotally connected to said slide rod by a pivot means, said pivot means passing through said transverse aperture while being guided therein; said inside portion of said hub member being selectively sized for a predetermined loose fit on an outer portion of said tubular cross section of said stationary shaft, said hub member further including a tilt adjustment means for controlling the tilt of an axis of said hub member with respect to said axis of said stationary shaft, said outer portion of said hub member being adapted for journalling a rotatable sleeve portion of the spreader roller;

(d) a linear adjusting means for selective positioning said slide rod interior of said tubular cross section; and

(e) a locking means for maintaining said slide rod at a selected position interior of said tubular cross section.

5,461,761

PROCESS AND APPARATUS FOR THE PRODUCTION OF EXPANDED GRIDS

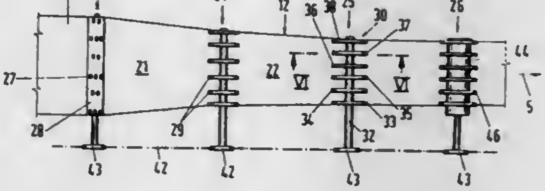
Bruno Knöpfli, Allschwil, and Ulrich Bühlmann, Biel-Benken, both of, Switzerland, assignors to Kuhni AG., Allschwil, Switzerland

Filed Nov. 24, 1993, Ser. No. 156,853

Claims priority, application Switzerland, Nov. 24, 1992, 3596/92

Int. Cl.⁶ B21D *31/04;47/00*

U.S. Cl. 29—6.1 **24 Claims**



1. A process for producing expanded mesh grids, comprising providing a length of material with staggered cuts therein,

conveying said length of material transversely to said staggered cuts, at a first speed with first conveying means, engaging the staggered cuts in said length of material with projection means on a second conveying means spaced from said first conveying means, and

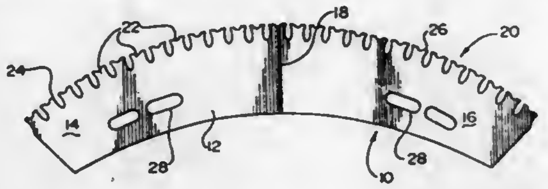
pulling said length of material by conveying said length of material transversely to said cuts with said second conveying means at a second speed that is grater than said first speed, thereby continuously stretching said length of material between the first and second conveying means into a three-dimensional expanded mesh grid.

5,461,762

COMPOUND ELLIPTICAL TIRE RASP BLADE

Wayne Jensen, Olympia Fields, Ill., assignor to B & J Manufacturing Co., Glenwood, Ill.
Filed Aug. 31, 1993, Ser. No. 114,773
Int. Cl.^{6} B23D *67/06*

U.S. Cl. 29—78 **11 Claims**



1. A tire rasp blade for use in a tire buffing machine which includes a rotating hub, comprising:

an elongated, generally arcuate and nonplanar body having two generally planar end portions each having first and second opposing sides, said generally planar end portions intersecting in a vertex positioned at a mid-portion of said body; and

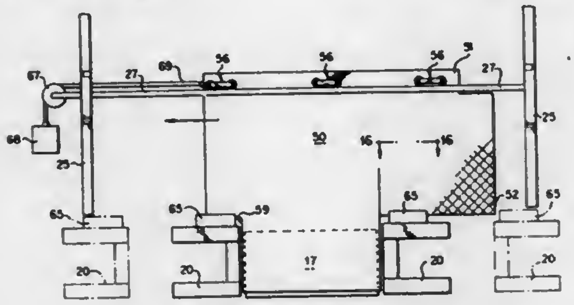
a working edge having two curved surfaces, each of said curved surfaces defining a portion of an ellipse having unequal major and minor axes and providing an effectively circular working edge when said blade is mounted to an rotated on said hub.

5,461,763

CURTAIN APPARATUS

James N. Donnelly, 4622 N. 525 W., LaPorte, Ind. 46350
Continuation-in-part of Ser. No. 132,763, Oct. 6, 1993, Pat. No. 5,357,664. This application Oct. 6, 1994, Ser. No. 319,284
Int. Cl.^{6} B21C *43/00;* **F16P** *1/00*

U.S. Cl. 29—81.08 **11 Claims**



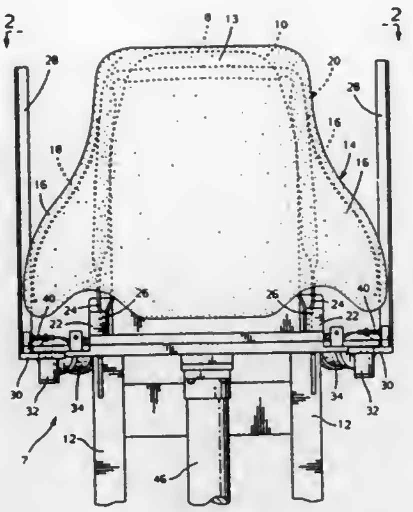
1. In a milling apparatus having a moveable guide arm which is adjusted according to various sizes of mill stock, and a top plate having an opening, a woven mesh metal curtain apparatus comprising: a fixed woven mesh metal curtain, a stop bracket secured to a top portion of said fixed woven mesh metal curtain, in a mounted position of said fixed woven mesh metal curtain within said opening said stop bracket abutting the top plate.

5,461,764

SEAT SKINNING APPARATUS

Donald J. Hotton, Rochester Hills, and Sherry A. Broad, Sterling Heights, both of Mich., assignors to General Motors Corporation, Detroit, Mich.
Division of Ser. No. 56,269, May 3, 1993, Pat. No. 5,345,661. This application Apr. 25, 1994, Ser. No. 232,900
Int. Cl.^{6} B65B *1/24;63/02*

U.S. Cl. 29—91 **3 Claims**



1. A seat skinning mechanism for skinning a flexible membrane cover on a polymeric foam vehicle seat body having lateral edges, the mechanism comprising:

a first support surface for positioning the seat body located generally underneath the seat body;

a second support surface contacting the seat body on a first vertical side of the seat body;

first and second wings, both of the wings being pivotally mounted with respect to the second support surface, the first and second wings being powered to pivot to cause the lateral edges of the seat body to fold upon themselves to an extent to allow the flexible membrane cover to be placed over the foam body, the second support surface and the wings; and

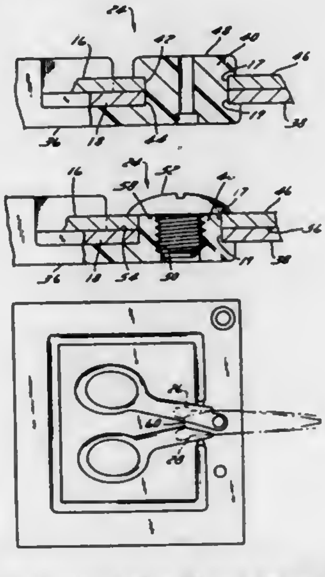
a lift to force the foam body upward, removing the seat body from between the second support surface and the wings with the membrane cover on the seat body.

5,461,765

METHOD OF MAKING A PIVOTED TOOL HAVING INTEGRAL PIVOT MEMBER

Erkki O. Lindén, Billnäs, and Karl S. Rönnholm, Karis, both of, Finland, assignors to Fiskars Oy Ab, Helsinki, Finland
Division of Ser. No. 23,811, Feb. 26, 1993, Pat. No. 5,325,592, which is a continuation-in-part of Ser. No. 986,057, Nov. 30, 1992, Pat. No. 5,341,573. This application May 17, 1994, Ser. No. 243,289
Int. Cl.^{6} B23P *11/00*

U.S. Cl. 29—434 **5 Claims**



1. A method for manufacturing a tool having first and second elongated members operable across a pivotable joint, each member having oppositely facing inner and outer surfaces; each member comprising a working end, a force applying end at the distal end

thereof, and a handle molded into engagement with said elongated member at the force applying end thereof; said pivotable joint comprising first and second registering apertures, one of each formed in a respective one of said elongated members, a pivot member joined to first of said handles by a tongue, said pivot member having a shank projecting from said tongue into said apertures, said shank terminating in a head lying adjacent and effectively in contact with the outer surface of said second of said elongated members, the method comprising the steps of:

disposing said pair of elongated members in a mold having first and second cavities adapted to receive said members with the inner surface of one of said members adjacent to the inner surface of the other of said members, said apertures being in substantial registration with a third cavity conforming with the shape of said head, said third cavity communicating with said apertures and with the handle area of said first cavity; and

injecting a molding material into said third cavity and into selected areas of said first and second cavities to form in a common molding operation said pivot member and said handles.

5,461,766

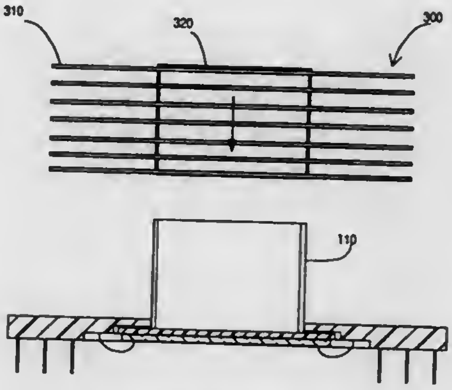
METHOD FOR INTEGRALLY PACKAGING AN INTEGRATED CIRCUIT WITH A HEAT TRANSFER APPARATUS

Trevor Burward-Hoy, Cupertino, Calif., assignor to Sun Microsystems, Inc., Mountain View, Calif.

Filed Jan. 26, 1994, Ser. No. 186,967

Int. Cl.^{6} B23P *15/00*

U.S. Cl. 29—447 **12 Claims**



1. A method for packaging an integrated circuit having a die, the method comprising the steps of:

providing a heat sink having a first end and a second end;

placing the first end inside an integrated circuit package such that the first end is coupled to the die and the second end projects from the integrated circuit package forming a post;

completing assembly of the integrated circuit package;

providing a heat transfer assembly having a shaft with an aperture;

heating the heat transfer assembly to expand the aperture such that the aperture may be fitted on the post with a minimum of pressure to avoid damaging the die when the heat transfer assembly is fitted on the post;

fitting the aperture on the post that projects from the integrated circuit package; and

cooling the heat transfer assembly to shrink the aperture such that the heat transfer assembly and the heat sink form a tight joint.

5,461,767

MANUFACTURING METHOD OF METAL BELLOWS

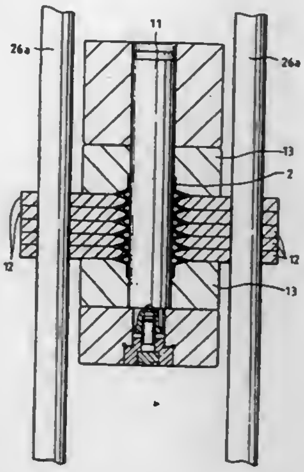
Kiyoshi Okubo, Maebashi, Japan, assignor to NSK Ltd., Tokyo, Japan

Filed Feb. 28, 1994, Ser. No. 203,036

Claims priority, application Japan, Nov. 26, 1993, 5-296406

Int. Cl.^{6} B23P *17/00*

U.S. Cl. 29—454 **19 Claims**



1. A method of manufacturing a metal bellows, comprising:

providing a plastically deformable cylindrical metal tube of predetermined length and outer diameter;

forming axially spaced, radially inwardly directed annular concavities in the tube about an entire circumference of the tube, without increasing the outer diameter of the tube between concavities;

inserting a core of outer diameter substantially equal to an inner diameter of the concavities within the tube to support the concavities from within;

bracing the concavities from a radially outward direction with respective brace members which are fitted into the concavities; and

axially pressing opposite axial ends of the tube to reduce the length of the tube and deform portions of the tube between the concavities radially outwardly, while shifting brace members bracing respective concavities along an axial direction of the tube to accommodate reduction in the tube length.

5,461,768

ELECTRICALLY HEATABLE CAULKING SYSTEM AND METHOD

Jiro Matsumoto, Shizuoka, and Ikuo Yanagisawa, Tokyo, both of, Japan, assignors to Nippon Light Metal Co., Ltd., Tokyo, Japan

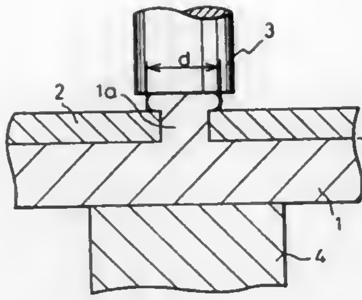
Continuation of Ser. No. 203,438, Mar. 1, 1994, abandoned, which is a continuation-in-part of Ser. No. 43,401, Apr. 6, 1993, abandoned. This application Oct. 19, 1994, Ser. No. 326,057

Claims priority, application Japan, Apr. 10, 1992, 4-907792

Int. Cl.^{6} B21D *39/00;* **B21J** *5/08*

U.S. Cl. 29—509 **16 Claims**

11. An electrical caulking system for attaching a first member together with a second member, said system being carried out using an electric caulking apparatus having first and second opposing electrodes, said first electrode being made of a material difficult to alloy with magnesium or magnesium alloy and consisting of at least 75.0% of tungsten and the remainder, if any, copper, at least said first member being made of magnesium or a magnesium alloy and comprising a body and a caulking pin integrally projecting from said body, and said second member having a caulking pin inserting hole at a corresponding position aligned with said caulking pin; said system comprising the steps of:



positioning said first and said second members together in such a manner that said caulking pin is inserted into said caulking pin inserting hole aligned with said caulking pin;

holding said first and second members between the opposing first and second electrodes in such a manner that said first electrode contacts said caulking pin and said second electrode contacts said body;

supplying an electric current between said first and said second electrodes;

exerting a pressure between said first and said second electrodes for caulking said caulking pin into a desired shape; and

forming said first electrode which contacts said caulking pin of the work from a material consisting of at least 75.0% tungsten and the remainder, if any, copper.

5,461,769

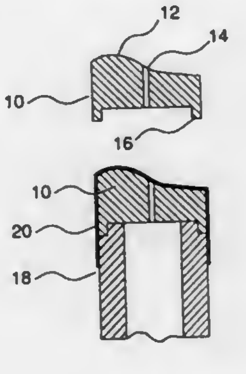
METHOD OF MANUFACTURING ELECTRICALLY CONDUCTIVE ELEMENTS PARTICULARLY EDM OR ECM ELECTRODES

Gavin McGregor, Gloucester, Canada, assignor to National Research Council of Canada, Ottawa, Canada

Filed Oct. 25, 1993, Ser. No. 140,484

Int. Cl.⁶ B22D *25/00*

U.S. Cl. 29—527.4 **8 Claims**



1. A method for manufacturing an electrode, the method comprising the steps of:

a) providing a digital representation of at least a working portion of the electrode,

b) forming a three-dimensional solid replica of the at least working portion of the electrode from, or based on, the digital representation, and

c) coating at least a part of the replica with a uniform, non-detachable layer of electrically conductive material, the shape of the outer surface of the conductive material being substantially a positive of the shape of the corresponding underlying part of the replica, to produce an electrode wherein the non-detachable conductive layer is integral with the underlying solid replica.

5,461,770

METHOD AND APPARATUS FOR CONTINUOUS CASTING AND HOT-ROLLING

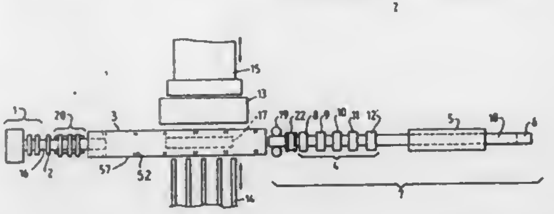
Tomoaki Kimura, Hitachi; Mitsuo Nihei, Tokyo; Kenji Horii, and Kenichi Yoshimoto, both of Hitachi, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 28, 1994, Ser. No. 187,491

Claims priority, application Japan, Jan. 29, 1993, 5-013255; Mar. 25, 1993, 5-066413; May 13, 1993, 5-111395

Int. Cl.⁶ B21B *1/46;13/22*

U.S. Cl. 29—527.7 **27 Claims**



1. Apparatus for continuous casting and hot-rolling of metal to produce metal strip, comprising, in a continuous production line:

(i) a continuous caster for continuously casting said metal to produce cast slab having a predetermined casting thickness,

(ii) an induction heater for reheating said cast slab, when said cast slab has said casting thickness, towards a hot-rolling mill train entry temperature by induction heating,

(iii) a temperature-maintaining furnace arranged to receive said cast slab directly from said induction heater and adapted to effect homogenization of temperature in said cast slab,

(iv) a hot-rolling mill train for hot-rolling said cast slab to said metal strip,

(v) a thermally insulated storage chamber alongside said temperature-maintaining furnace for storing a length of said cast slab parallel to the direction of travel of said cast slab in said temperature-maintaining furnace, and

(vi) a transfer conveyor for transferring a cast slab laterally between said temperature-maintaining furnace and said storage chamber,

wherein said temperature-maintaining furnace has an opening covered by a closable door and extending parallel to a travel direction of the slab with a length corresponding to a length of a slab for accommodating lateral transfer of a slab by said transfer conveyor from the temperature-maintaining furnace to the thermally insulated storage chamber and from the thermally-insulated storage chamber back to the temperature-maintaining furnace.

15. A method of continuous casting and hot-rolling of metal to produce metal strip, wherein the following steps are carried out in sequence in a continuous production line:

(i) continuously casting said metal to produce cast slab,

(ii) cutting said cast slab into slab lengths,

(iii) passing said slab lengths through a thermally insulated zone in which temperature homogenization takes place in said slab lengths, and

(iv) hot-rolling said slab lengths in a hot rolling mill train to produce said metal strip,

said method being characterized by, in the event of a stoppage in the operation of said hot-rolling mill train, transferring at least one said slab length laterally from said thermally insulated zone into a thermally insulated storage zone alongside said thermally insulated zone, and by transferring said at least one slab length back from said storage zone to said thermally insulated zone when it is required for hot-rolling,

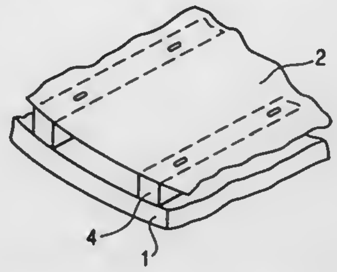
wherein said transferring said at least one slab length between the thermally insulated zone and the thermally insulated storage zone is carried out by transferring said at least one slab length through an opening of the thermally insulated zone which is covered by a selectively closable door and extends parallel to a travel direction of the slab length in the thermally insulated zone with an opening length corresponding to said slab length.

5,461,771

METHOD OF PRODUCING ELECTROMAGNETIC FLOWMETERS WITH SLITS TO REDUCE EDDY CURRENTS

Ichiro Wada, Kanagawa, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 14, 1992, Ser. No. 990,072
Claims priority, application Japan, Dec. 20, 1991, 3-338245
Int. Cl.^{6} H01F *41/02*
U.S. Cl. 29—602.1 **14 Claims**



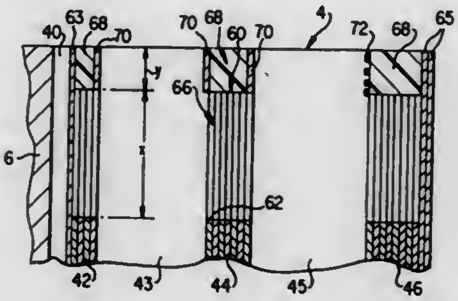
1. A method of producing electromagnetic flowmeters having a magnetic core and an outer casing protecting said magnetic core comprising the steps of:
fixing said magnetic core inside said outer casing; and
making a plurality of slits in the fixed magnetic core.

5,461,772

METHOD OF MANUFACTURING A STRIP WOUND COIL TO REINFORCE EDGE LAYER INSULATION

Jeewan Puri, Matthews, N.C., assignor to Square D Company, Del.

Filed Mar. 17, 1993, Ser. No. 32,225
Int. Cl.^{6} H01F *41/06*
U.S. Cl. 29—605 **9 Claims**



1. A method of manufacturing a strip wound coil for use in a transformer, said coil including a sheet insulator material coincident with a sheet conductor material wound on a cylindrical mandril a predetermined number of turns and further including formed air channels, said method to prevent top and bottom edges of said sheet insulator material from collapsing over said formed air channels during a vacuum and pressure impregnation process, said method comprising:

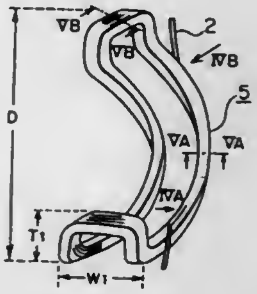
a. forming a pocket extending above and below said top and bottom edges of said sheet conductor material and between a first turn and a last turn of said sheet insulator material, said pocket to provide electrical isolation means for said sheet conductor material;
b. reinforcing said first turn and last turn of said sheet insulator material to prevent collapse of said sheet insulator;
c. packing said pocket with a porous dielectric material to provide said isolation means;
d. vacuum and pressure impregnating said coil with resin to form a high strength bond between adjacent windings of said conductor sheet material; and
e. adding further insulating means to said formed pocket to prevent contamination of said sheet conductor material and provide electrical insulation for withstanding high voltage gradients.

5,461,773

METHOD OF MANUFACTURING COILS FOR USE IN CHARGED PARTICLE DEFLECTING ELECTROMAGNET

Takeo Kawaguchi, Kobe, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 751,054, Aug. 28, 1991, Pat. No. 5,278,533. This application Oct. 8, 1993, Ser. No. 133,340
Claims priority, application Japan, Aug. 31, 1990, 2-228020; Aug. 19, 1991, 3-206777
Int. Cl.^{6} H01F *41/06*
U.S. Cl. 29—605 **5 Claims**



1. A method of manufacturing coils for use in charged particle deflecting electromagnets, said method comprising the steps of:
forming a plurality of flat coils including forming a plurality of right-handed flat coils and a plurality of left-handed flat coils, each of the right and left-handed flat coils being formed by winding a conducting wire outwardly from a reference point and fixedly adhering the conducting wires to each other, each flat coil including an inner diameter portion disposed on an inner diameter side of an arcuate path of charged particles, an outer diameter portion disposed on an outer diameter side of said path, and coil end portions located at two sides of said inner an outer diameter portions for connecting said inner an outer diameter portions with each other;
forming coil units by bending the two coil end portions of each of said flat coils in a direction opposite to said path such that they oppose each other;
stacking a predetermined number of coil units;
adhering the stacked coil units to one another; and
electrically connecting the stacked coil units.

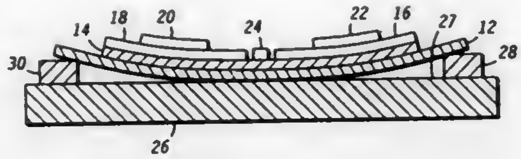
5,461,774

APPARATUS AND METHOD OF ELASTICALLY BOWING A BASE PLATE

Jeffrey G. Holmes, and Andrew C. McNeil, both of Scottsdale, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 25, 1994, Ser. No. 217,831
Int. Cl.^{6} H01R *43/16*; H01B *7/34*
U.S. Cl. 29—840 **19 Claims**

1. An apparatus for bonding thermally dissimilar materials, comprising:
a mounting surface;
a base plate having a perimeter area;
a plurality of shims placed between said base plate and said mounting surface; and



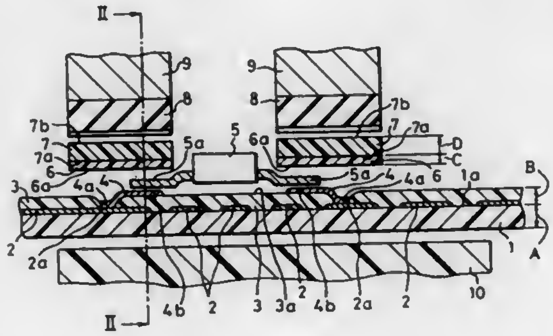
a restraining mechanism holding said base plate against said mounting surface to elastically bow said base plate.

5,461,775
METHOD FOR MOUNTING ELECTRONIC COMPONENT ON A FLEXIBLE PRINTED CIRCUIT BOARD

Kouji Tanabe, Katano, and Naohiro Nishioka, Yawata, both of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Apr. 19, 1994, Ser. No. 230,033
Claims priority, application Japan, Apr. 27, 1993, 5-100911
Int. Cl.^{6} H05K *3/34*

U.S. Cl. 29—840 **12 Claims**



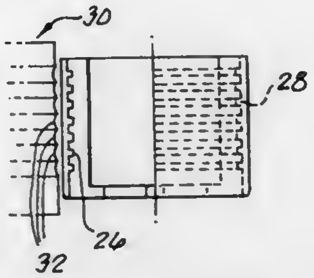
1. Method for mounting electronic component on a flexible printed circuit board comprising the steps of:
- forming a first printed circuit by way of printing on one face of a first insulation film, which has a property of at least one of thermoplasticity and thermosetting property;
- covering said first printed circuit and said one face of said first insulation film by way of printing with a first insulating resist layer, which has a property of at least one of thermoplasticity and a property of thermosetting and heating adhesion;
- forming a second printed circuit by way of printing on one face of said first insulating resist layer;
- disposing a terminal of an electronic component on a second connecting part of said second printed circuit;
- covering a first face of a second insulation film, which has a property of at least one of thermoplasticity and thermosetting property, by way of printing with a second insulating resist layer, which has a property of at least one of thermoplasticity and a property of thermosetting and heating adhesion, and disposing said second insulation film on said one face of said first insulating resist layer in a manner that said second connecting part and said terminal are disposed between said one face of said first insulating resist layer and one face of said second insulating resist layer;
- pressing a second face of said second insulation film in a manner to connect said terminal with said second connecting part and heating said second face of said second insulation film in a manner to weld said one face of said first insulating resist layer and said one face of said second insulating resist layer.

5,461,776
METHOD OF MANUFACTURING PISTON RINGS

Graham R. Wood, Tisbury, England, assignor to AE Piston Products Limited, Bradford, England

Continuation of Ser. No. 65,444, May 24, 1993, abandoned, which is a continuation of Ser. No. 630,549, Dec. 20, 1990, abandoned. This application Sep. 20, 1994, Ser. No. 308,962
Claims priority, application Japan, Jan. 9, 1990, 2-9000446
Int. Cl.^{6} B23P *15/00*

U.S. Cl. 29—888.072 **18 Claims**



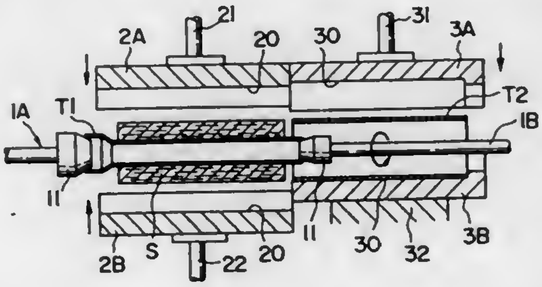
1. A method for the production of piston rings, the method comprising the steps of producing a tube of the material from which the rings are to be made, machining predetermined noncylindrical ring free shapes on the inner and outer diameters of the tube which substantially correspond to the required unconstrained free shape of the piston ring, cutting each individual ring from the tube so machined, and, at a point in the process subsequent to said machining, removing material corresponding to the ring gaps in finished unconstrained rings.

5,461,777
APPARATUS FOR MANUFACTURING A SILENCER

Tsukasa Ikeda, Ohmiya, and Akihiko Tamano, Ageo, both of, Japan, assignors to Sankei Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 15, 1994, Ser. No. 228,035
Claims priority, application Japan, Apr. 19, 1993, 5-115446
Int. Cl.^{6} B23P *15/00*

U.S. Cl. 29—890.08 **2 Claims**

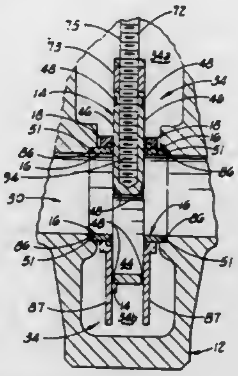


1. An apparatus for manufacturing a silencer with sound-absorbing material filled in a space between a multi-perforated inner tube and an outer tube, which apparatus comprises:
- driving means for rotationally driving said inner tube, which driving means holds at least the inner tube thereon and rotationally drives the same at a predetermined speed, said driving means driving said inner tube in a direction of winding of sound absorbing material wound on said inner tube;
- a pair of levelling members, each having on mutually opposed surface sides, semi-circular concavities of a size substantially equal to the inner diameter of said outer tube, for leveling the outer diameter of said sound-absorbing material wound on and around said inner tube to a diameter substantially equal to the inner diameter of said outer tube; and
- means for immobilizably fixing the outer tube, said pair of levelling members being disposed in a manner to be movable

in the direction perpendicular to the axial direction of said inner tube as it is rotationally driven by said inner tube driving means, said outer tube immobilizing means being disposed adjacent to said levelling members.

5,461,778
GATE VALVE

Dwight Baker, P. O. Box 249, Rush Springs, Okla. 73082
Division of Ser. No. 196,684, Feb. 15, 1994, Pat. No. 5,377,955. This application Dec. 28, 1994, Ser. No. 366,089
Int. Cl.^{6} F16K *3/00*
U.S. Cl. 29—890.124 **10 Claims**

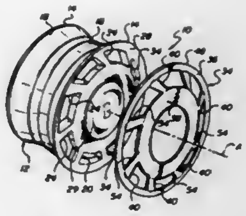


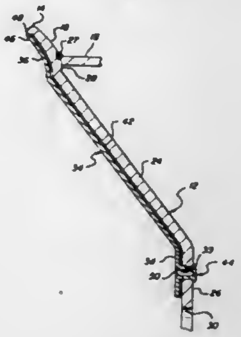
1. A method of forming a gate for a gate valve, the method comprising the steps of:
- providing a plate having a first side and a second side;
- forming an opening through the plate between the first and second sides thereof such that the plate is characterized as having a closure area and a flow opening;
- forming a first recess in the plate wherein the first recess circumscribes the flow opening and the closure area on the first side of the gate
- forming a second recess in the plate wherein the second recess circumscribes the flow opening and the closure area on the second side of the gate;
- fixing an alloy into each of the recesses.

5,461,779
METHOD OF FORMING A COMPOSITE VEHICULAR WHEEL ASSEMBLY

Jeffrey Beam, Plymouth, Mich., assignor to Thompson International, Troy, Mich.
Division of Ser. No. 116,712, Sep. 3, 1993, Pat. No. 5,368,370. This application Oct. 3, 1994, Ser. No. 316,945
Int. Cl.^{6} B21K *1/28*
U.S. Cl. 29—894.381 **4 Claims**

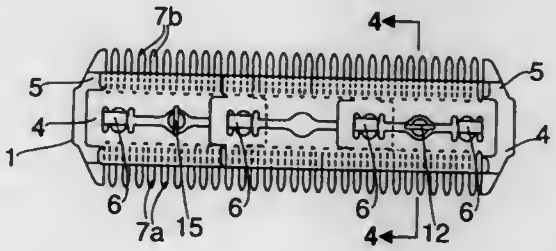
1. A method for forming a composite vehicular wheel assembly (10) having a permanent ornamental surface treatment, said method comprising the steps of: forming an annular rim (12) having a pair of spaced rim flanges (14); forming a spider (20) having a plurality of spokes (24) with interposed spaces; supporting the spider (20) concentrically within the rim (12); forming an ornamental applique (34) having a substantially uniform material thickness and an annular outer connecting portion (36) and an annular inner connecting portion (38); forming a plurality of vent openings (40) in the applique (34) between the outer (36) and inner (38) connecting portions; positioning the applique (34) centrally over the spider (20) and rim (12) while aligning the applique vent openings (40) in the spaces between the spokes (24); compressing an adhesive (42) to a uniform thickness between the applique (34) and the spider (20); and mechanically maintaining said compressing step with locking means that coact with the applique and the rim to compress the adhesive until the adhesive (42) is set and the locking means remaining in place after the adhesive is cured.





5,461,780
HAIR TRIMMING DEVICE

Frank J. Morana, 41 Laurel Ave., West Orange, N.J. 07053
Filed Jul. 30, 1993, Ser. No. 100,498
Int. Cl.^{6} B26B *21/12*
U.S. Cl. 30—30 **21 Claims**



1. A hair trimming/cutting device employing at least one double-edge blade having an aperture, comprising:
- an elongated base element defining a first longitudinal axis and a first facing surface of predetermined configuration;
- a backing element at least a portion of which is elongated with respect to at least a portion of the base element, and defining a second longitudinal axis substantially coincident in direction with the longitudinal axis of the base element and a second facing surface of predetermined configuration intended for mating relationship with said first facing surface;
- at least one of said base and backing elements providing at least one set of comb-like teeth of predetermined length and spacing, arranged relative to its longitudinal axis;
- at least one of said base and backing elements providing a recess extending longitudinally for safely housing said at least one blade;
- rotatably multi-orientational locking means adjustably coupled to one of said base and backing elements, for locking and unlocking the base and backing elements, said locking means structured to remain intact when said base and backing elements are disengaged;
- at least one aperture of predetermined configuration extending through the other of said base and backing elements in substantial predetermined alignment relative to the aperture of said at least one blade, for receiving through said at least one blade at least a portion of said locking means when the latter is in a first orientation, and securing the base and backing elements together, with said at least one blade therebetween, when in a second orientation.

5,461,781

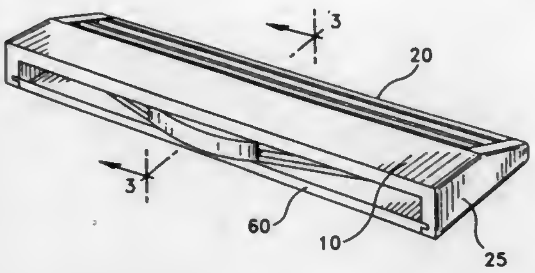
DYNAMIC SHAVING SYSTEM WITH INTEGRAL PUSH CLEAN BAR AND SPRING MEMBER

Douglas J. Pirc, Orange, Conn., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed Jul. 1, 1994, Ser. No. 270,075

Int. Cl.^{6} B26B *21/22*

U.S. Cl. 30—41 **15 Claims**



1. A razor head comprising:

a blade support structure comprising side walls;

at least one movable skin-engaging element supported for movement in response to forces encountered during shaving and biased to a first position;

a movable cleaning member for removing shaving debris from said razor head, said cleaning member comprising means for biasing said movable skin-engaging element to said first position wherein said biasing means contacts said skin-engaging element and urges said skin-engaging element to said first position;

wherein said razor head comprises at least two blades disposed in spaced relation and defining a space therebetween; and wherein said cleaning member comprises a projection which extends into said space and wherein said cleaning member further comprises an actuator portion which is connected to said projection so that when said actuator portion is moved, said projection moves within said space;

and further wherein said biasing means comprise at least one spring finger and said spring finger comprises a first end connected to said actuator portion and a second end which contacts said movable skin-engaging element.

5,461,782

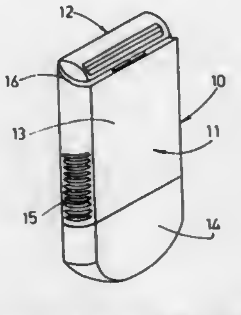
SHAVING KIT

Joseph A. Rauch, Tivon, Israel, assignor to P.I.D. Rauch Industrial Design Ltd., Tivon, Israel, and Haim Zeleznik, Fresh Meadows, N.Y.

Filed Feb. 15, 1994, Ser. No. 196,644

Int. Cl.^{6} B26B *21/44*

U.S. Cl. 30—47 **3 Claims**



1. Shaving kit comprising an openable box-like body having a main body portion and a snap-on lid; a blade assembly; and means for providing a snap-on connection of said blade assembly to said main body portion, said main body portion being provided with an arcuate seat-shaped upper surface to support said blade assembly during the shaving operation.

5,461,783

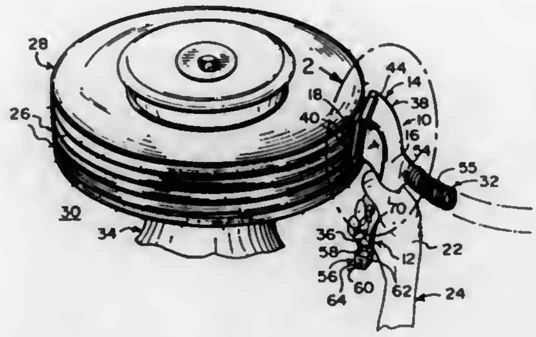
NEW STYLE TRIM KNIFE

Greg Henderson, 412 Westwood St., Opelika, Ala. 36801

Filed Oct. 24, 1994, Ser. No. 327,693

Int. Cl.^{6} B26B *5/00*

U.S. Cl. 30—124 **9 Claims**



1. A new style trim knife comprising:

a) a handle, said handle including a finger grip on an underside thereof, so that a hand of a person can better grasp said handle;

b) a head on a first end of said handle, said head being a curved projection extending downwardly from the first end of said handle;

c) a blade, said blade including a plurality of saw teeth formed along one edge thereof;

d) means for securing said blade to said head, so that said hand of said person can grasp said handle to allow said blade to cut off protrusions and rises left by a molding process on plastic, rubber and any other molded product at a work area, said securing means including a plurality of fasteners to attach said blade to a free end of said curved projection, whereby said blade is set below and in parallel arrangement to said handle, with said saw teeth extending rearwardly, so that said saw teeth of said blade can cut off the protrusions and rises when the hand of the person grasps said handle and pulls said handle rearwardly; and

e) means built into said head for removing by a suction action the loose cut off protrusions and rises with a vacuum unit, so that the loose cut off protrusions and rises will not cause damage to equipment located at the work area.

5,461,784

CIRCULAR-BLADED PRUNING SHEARS WITH HOLDING ACTION

Joseph Baron, 229 Ave. Vista del Oceano, San Clemente, Calif. 92672

Filed Sep. 12, 1994, Ser. No. 304,166

Int. Cl.^{6} B26B *1/00*

U.S. Cl. 30—135 **19 Claims**

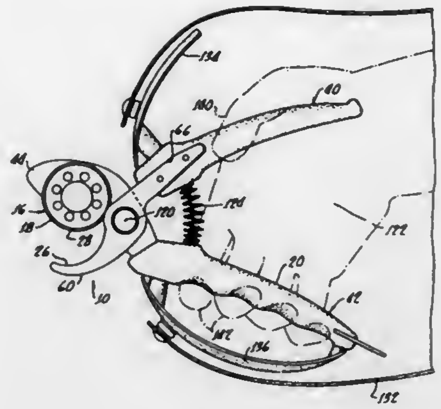
1. An apparatus for pruning plants, said apparatus comprising:

pruning means, including a cutting blade, for cutting a plant;

handle means, for operating said pruning means;

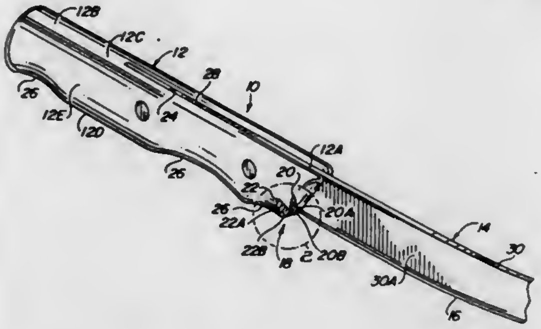
holding means, operative by said handle means, for securing a severed piece of said plant until said handle means is released; and

sleeve shield means, comprising a flexible sleeve extending over said handle means up to approximately a user's elbow, for protecting a user's hand from injury.



5,461,785
KNIFE HANDLE WITH SHARPENING GUIDE INDENTATIONS

Han Sol Na, 35 Latham Village La., #31, Latham, N.Y. 12110
Filed Feb. 4, 1994, Ser. No. 191,559
Int. Cl.^{6} B25G *1/00;* B26B *3/00*
U.S. Cl. 30—138 19 Claims



1. In combination with a knife having a handle adapted for gripping by a user's hand, an elongated blade mounted to said handle so as to extend generally longitudinally outwardly therefrom and a longitudinal sharpenable cutting edge defined on said elongated blade, a sharpening guide structure comprising:

(a) guide means formed on one end of said handle of said knife adjacent to said cutting edge defined on said blade of said knife;

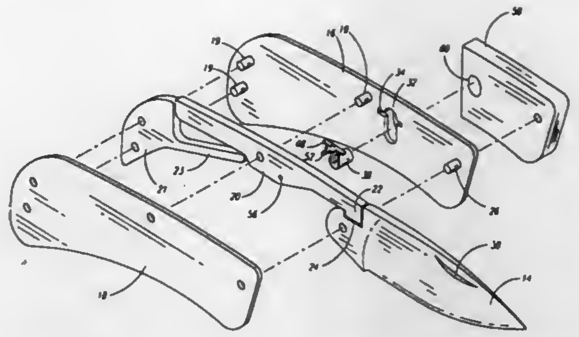
(b) said guide means being formed in a predetermined angular relationship to said cutting edge of said blade for facilitating alignment of an elongated sharpening bar at an appropriate angle to said cutting edge of said blade to correctly sharpen said blade;

(c) said guide means including at least one elongated guide indentation defined on said one end of said handle of said knife adjacent to one of a pair of opposite sides of said blade of said knife.

5,461,786
LOCK BLADE KNIFE

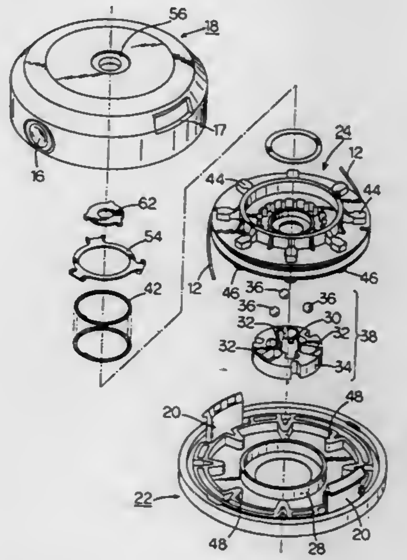
Ted Miller, Rte. 2, Box 242, Vinita, Okla. 74301
Filed Feb. 24, 1995, Ser. No. 393,652
Int. Cl.^{6} B26B *1/04*
U.S. Cl. 30—161 4 Claims

1. A lock blade knife having a handle portion and a blade, the handle portion including a pair of spaced upper and lower side plates which enclose the blade between them, the blade being pivotally mounted between the plates so as to be movable from a closed position within the handle portion to an open position where the blade extends to one side of the handle portion in alignment therewith, the side plates also enclosing a spring means which is urged towards the blade, the spring means having an end provided with a pawl which is received in a notch at an end of the knife blade when the blade is in the open position, one of said plates being provided with a T-shaped slot consisting of a vertical oval slot and a narrow horizontal and intersecting slot representing the arm of the T, a lever consisting of a button attached to a piece of spring steel which is bent at right angles, the spring steel piece including a pair of horizontally extending arms and an outwardly extending finger, the lever being received in the T-shaped slot such that the button projects out of the oval slot and the finger contacts an inboard side edge of the spring means to the right of its pivot point, the horizontally extending arms bearing against the edge of the horizontal slot, so that, when pushing down on the button, the ends of the arms will cause the lever to pivot so as to urge the spring means in a direction away from the blade, thereby causing the pawl to move out of the notch permitting the knife blade to be closed.



5,461,787
FILAMENT-TYPE TRIMMING APPARATUS

Minoru Araki, Chiba, and Shinichi Miyama, Ichihara, both of, Japan, assignors to Tanaka Kogyo Co., Ltd., Chiba, Japan
Filed Sep. 28, 1994, Ser. No. 314,329
Claims priority, application Japan, Apr. 7, 1994, 6-092854
Int. Cl.^{6} A01D *50/00*
U.S. Cl. 30—276 2 Claims



1. A filament-type trimming apparatus comprising:

a reel case which includes a main body and a bottom member;

a cord reel housed inside said reel case and on which a nylon cord is wound;

plural stoppers provided on a lower surface of the cord reel and on an inside of the bottom member and which become engaged when the cord reel is pressed downward by a coil spring;

a mechanism for releasing a centrifugal force of the cord reel, and which is provided between the cord reel and the bottom member, and which mechanism comprises radial guide grooves and balls arranged inside said guide grooves;

plural stoppers provided on an upper surface of the cord reel and on an inner surface of the reel case main body respectively and which become engaged when the cord reel is pressed upward resisting against the pressing force of the coil spring;

a boss provided inside a center portion of said reel case main body and to which the coil spring is fixed;

plural positioning projections provided outside said boss in a direction of rotation at predetermined intervals, the positioning projections each having a height graduated with respect to one another; and

a spacer member, which is rotatable with respect to the positioning projections, interposed between the positioning projections and the coil spring.

5,461,788

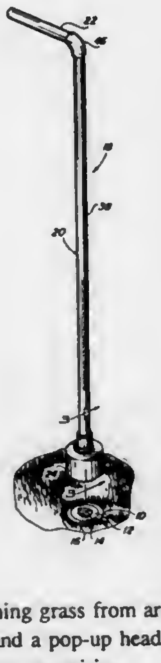
GRASS TRIMMING DEVICE FOR POP-UP SPRINKLERS

Jack Taylor, 3207 W. Renee Dr., Phoenix, Ariz. 85027

Filed Sep. 8, 1994, Ser. No. 302,331

Int. Cl.^{6} B26B *27/00*

U.S. Cl. 30—300 **8 Claims**



1. A device for trimming grass from around a pop-up sprinkler having an annular top and a pop-up head concentrically mounted within the top, the device comprising:

a handle having a grip mounted on one end and a circular cutting element mounted on the opposing end, the cutting element having a diameter larger than that of the top; and

a smooth and convex stove bolt head engaging the pop-up head, the head being mounted within the interior of the cutting element.

5,461,789

ROLLER NOSE CHAIN SAW GUIDE BAR

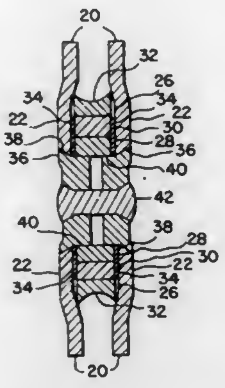
Thomas Beerens, 25 Fisher Court, Sunbury 3429 Victoria, Australia

Filed Oct. 28, 1993, Ser. No. 144,836

Claims priority, application Australia, Jan. 28, 1992, PL5546; May 28, 1993, PL9053

Int. Cl.^{6} B27B *17/04*

U.S. Cl. 30—384 **12 Claims**



1. A chain saw guide bar for supporting a saw chain which rotates around the guide bar, comprising

a. said guide bar having a free end with two opposed substantially parallel, nonrotational nose plates fixed to the free end, with a normal preset gap being defined between the outwardly formed recess at the free end which opposes the parallel nose plates, each guide bar nose plate having an outwardly formed recess in the opposed nose plate to provide a mounting gap therebetween greater than said normal present gap;

b. an idler roller assembly mounted within said mounting gap between the outwardly formed recesses in the nose plates, said idler roller assembly having an idler roller with a width greater than the normal preset gap between the parallel nose plates, and wherein said idler roller has a concave groove formed in the outer circumference of the idler roller, within which concave groove the saw chain tracks as it rotates around the idler roller.

5,461,790

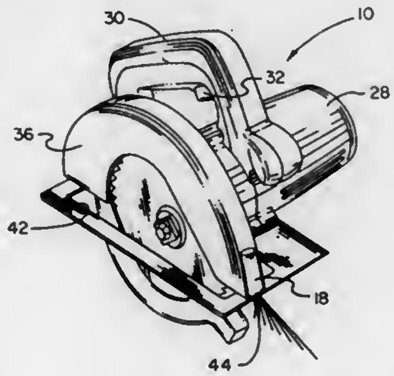
CIRCULAR SAWS WITH LASER GUIDES FOR MORE PRECISE MOVEMENT DURING CUTTING

Franek Olstowski, 4010 Cedar Gardens, Houston, Tex. 77082

Filed Feb. 16, 1994, Ser. No. 197,331

Int. Cl.^{6} B23D *47/00*

U.S. Cl. 30—391 **3 Claims**



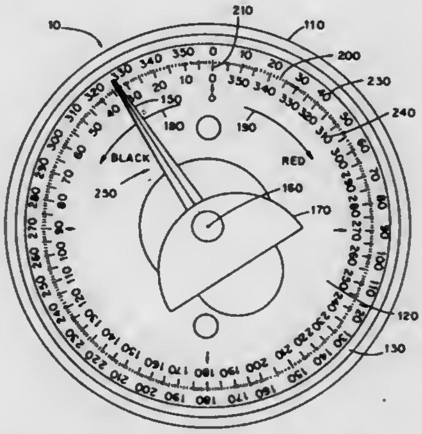
2. A circular saw for more precise movement during cutting comprising:

a circular blade with a peripheral edge having teeth and a power source to rotate the blade about its axis;

a shield covering at least a portion of the blade to protect a user from the peripheral teeth of the blade;
a blade plate positionable on the work piece to be cut with an elongated aperture for the passage therethrough of the blade, the blade plate having a notch at its leading edge in alignment with the plane of the blade;
a laser device positioned on the shield to project a laser beam in a line beginning at the notch along the workpiece in a line along the direction to be cut;
means to power the laser with a visible light;
an optical element to fan the laser beam onto the workpiece in a line within the blade plane and into the intended direction of blade movement at an angular divergence between about thirty and sixty degrees; and
first support means coupling the laser device to the shield, the first support means including a dovetail coupling with locking means to move the laser device toward and away from the workpiece.

5,461,791
APPARATUS AND METHOD FOR ROTATIONALLY POSITIONING A ROTOR

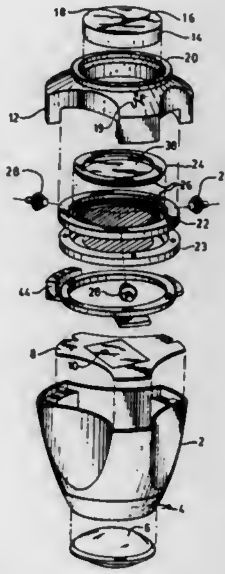
Richard W. Piety, Knoxville, Tenn., assignor to Computational Systems, Inc., Knoxville, Tenn.
Filed Mar. 29, 1994, Ser. No. 219,110
Int. Cl.⁶ G01B *5/24;* **G01M** *1/00*
U.S. Cl. 33—1 N **10 Claims**



6. An instrument for rotationally positioning a rotor that rotates in an operational rotational direction, comprising:
a housing having first and second parallel opposing faces,
a weighted pendulum needle indicator having two ends, with a tip at one end and a weight at the other end, and rotatably mounted at a point in the mid-region of the needle indicator to the inside of the first face of the housing such that when the faces of the housing are substantially vertically oriented the rotational position of the needle indicator will be primarily influenced by gravity alone, and not by the rotational position of the housing;
an attachment means fixedly mounted to the first face of the housing for removably mounting said housing to a rotor;
a viewport fixedly mounted to the second face of the housing such that the needle indicator mounted within the housing may be viewed from without the housing;
a first set of indicia, having a first distinguishing characteristic, on the inside of the first face of the housing such that it can be viewed behind the needle indicator when looking through the viewport, the indicia forming a ring, the radius of which is approximately equal to the length of the needle indicator from the tip thereof to the point at which it is rotatably mounted, and having tick marks equally spaced around the circumference of the ring which they form;
a second set of indicia disposed in a ring adjacent to said tick marks, having a second distinguishing characteristic, on the inside of the first face of the housing such that said second set can be viewed behind the needle indicator when looking through the viewport, and having a plurality of numbers, indicating a zero position and indicating angles extending away from the zero position in a first direction corresponding to the operational rotation direction of the rotor;
a third set of indicia disposed in a ring adjacent to said tick marks, having a third distinguishing characteristic, on the inside of the first face of the housing such that it can be viewed behind the needle indicator when looking through the viewport, and having a plurality of numbers, indicating the zero position and indicating angles extending away from the zero position in a second direction opposite from the first direction, said second direction corresponding to an against rotation direction that is opposite from the operational rotational direction;
a first arc shaped arrow, having the second distinguishing characteristic, positioned adjacent to and substantially concentric to the tick marks, and pointing in the second direction, for indicating that said second set of indicia should be used to rotationally position the rotor when the operational rotational direction is the second direction; and
a second arc shaped arrow, positioned adjacent to and substantially concentric to the tick marks, having the third distinguishing characteristic, and pointing in the first direction opposite from the second direction, for indicating that said third set of indicia should be used to rotationally position the rotor when the operational rotational direction is the first direction.

5,461,792
NAVIGATION AID WITH BIANGULATION

David C. Hill, Oakville, Canada, assignor to Navitrak Corp., Oakville, Canada
Filed Jul. 8, 1994, Ser. No. 271,910
Int. Cl.⁶ G01C *17/02;21/20*
U.S. Cl. 33—1 SD **4 Claims**



1. A navigation device comprising, mounted in a case parallel to and aligned with each other, said case having openings at opposite ends thereof:
a lens across one said opening;
a compass across the other said opening, having a body, transparent faces and a magnetic compass needle;
a first grid wheel between said lens and said compass, having a transparent central area inscribed with at least one first directional arrow, at a distance from said lens approximating the focal length of the lens;

a second grid wheel immediately adjacent said first grid wheel, and releasably secured to said first grid wheel such that it normally rotates with said first grid wheel, but is readily separable therefrom for independent rotation, said second grid wheel also having a transparent central area inscribed with at least one second directional arrow, at a distance from said lens approximating the focal length of the lens;

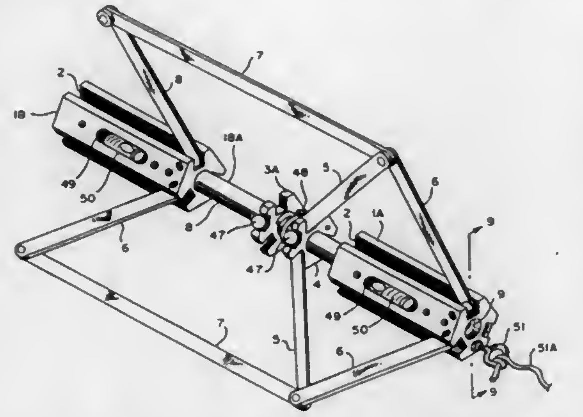
positioned between said first grid wheel and said compass, and geared to said first grid wheel for counter-rotation therewith, a direction wheel having a transparent or translucent central area inscribed with at least one third directional arrow; and

a transparency holder adapted to carry a map transparency with magnetic north thereon aligning with a north marking on said case or on the body of said compass, said transparency holder being in close proximity to said grid wheels such that it is also at a distance from the lens approximating the focal length of the lens.

5,461,793

SELF CENTERING PIPE AXIS LASER GUIDE

Kenneth B. Melville, 9507 50th Pl., College Park, Md. 20740
Continuation-in-part of Ser. No. 41,038, Mar. 31, 1993, Pat. No. 5,359,781. This application Oct. 7, 1994, Ser. No. 319,928
Int. Cl.^{6} G01B *11/27*
U.S. Cl. 33—286 **8 Claims**

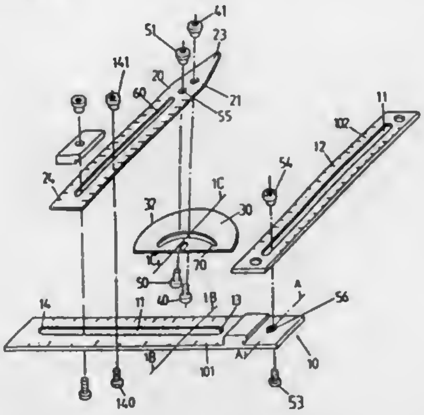


1. A self centering pipe or pillow block axis laser guide for a pipe or pillow block having an inside diameter and an outside diameter, comprising an expandable and contractible linkage mechanism that is adapted to be inserted into the interior of said pipe or said pillow block, said linkage including three parallel links having opposite ends and being spaced 120 degrees apart that when expanded can contact the interior the interior of said pipe or pillow block and establish the center axis of said pipe or pillow block, each of said parallel links being connected at each end to radial link, said radial links being inclined in the same direction, each of said parallel links being further connected to an intermediate lever link at a location between said opposite ends, a pipe housing connected to a front end spider element and a rear end spider element, a spider lever element and an associated spring base spider element located between said front and rear end spider elements, each of said elements having a bore that fits over said pipe housing, each of said elements having three machined channels spaced 120 degrees apart, said spider lever element and said associated spring base spider element each having a thumbscrew mounted therein, and a biasing means mounted therebetween, means fastening said lever link to said spider lever, said pipe housing being centrally located with respect to said parallel links, said thumbscrews controlling the movement of said lever link and the contraction or expansion of said parallel links such that when each thumbscrew is released said parallel links can be completely retracted, when said thumbscrew of said spring base spider element is locked and said thumbscrew of said spider lever element is open, said parallel links can be partially expanded or partially contracted, said pipe housing containing a laser module and a power supply subassembly, said laser module being in a front end of said pipe housing and in alignment with said center axis of said pipe or pillow block when said laser guide is inserted into said pipe or pillow block.

5,461,794

MOVABLE TYPE MEASUREMENT SCALE AT VARIABLE ANGLES

Jui L. Huang, No. 303, Tai Ming Rd., Wu Jih Hsiang, Taichung Hsien, Taiwan, Prov. of China
Filed Nov. 9, 1993, Ser. No. 149,656
Int. Cl.^{6} B43L *7/10*
U.S. Cl. 33—470 **4 Claims**



1. A ruled instrument, comprising:

a main body formed of a first main body part and a second main body part, said first main body part and said second main body part being connected to form substantially an L shape;

a through slot provided in said first main body part, said through slot having a lower side forming a sliding groove;

a measurement ruler having a through slot;

a screw and nut assembly including a screw part passing through said through slot of said measurement ruler and through said through slot of said first main body part to connect said measurement ruler to said first main body part, said nut being retained within said sliding groove;

a scale ruler having a semi-circular body, said scale ruler having an arc-shaped slot with a sliding groove formed on a lower surface of said scale ruler, said scale ruler sliding groove having an arc shape cooperating with said arc-shaped slot, said measurement ruler having a hole on an end thereof;

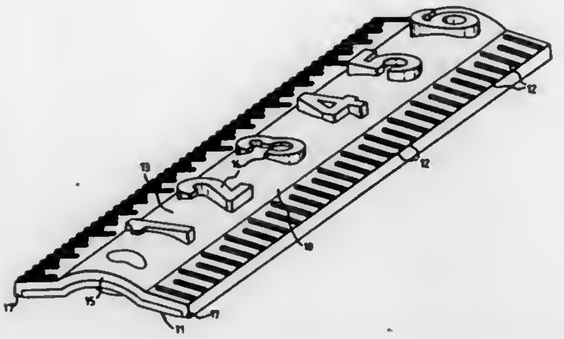
a second screw and nut assembly including a second screw passing through said hole of said measurement ruler and passing through said arc-shaped slot and said arc-shaped sliding groove and a second nut, said second nut being retained within said arc-shaped sliding groove, for fixing said scale ruler to an end of said measurement ruler.

5,461,795

MEASURING INSTRUMENT AND METHOD OF MAKING SAME

Tat C. Kok, Kowloon, Hong Kong, assignor to Ever-Success Development Co., Ltd., Kowloon, Hong Kong
Filed Jul. 28, 1993, Ser. No. 98,038
Claims priority, application United Kingdom, Mar. 25, 1993, 9306227
Int. Cl.^{6} B43L *7/00;* **G01B** *3/02*
U.S. Cl. 33—483 **6 Claims**

1. A measuring instrument having an upper measuring surface provided with graduation marks and numerals and a lower surface comprising a first plastics molding formed with apertures therein and one or more second plastics moldings molded to a lower surface of said first molding and having portions extending through



the apertures in the first molding and lying proud of the measuring surface of the first molding, the portions being larger than the apertures of said first molding and overlying the measuring surface of said first molding.

5,461,796

GUNSIGHT DEVICE FOR ROTATING-WING AIRCRAFT

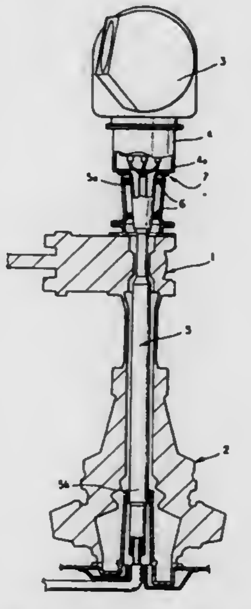
Jean P. Jalaguier, Vitrolles, and Tomasz Krysinski, Marseille, both of, France, assignors to Societe Anonyme dite: Eurocopter France, Marignane Cedex, France

Filed Mar. 15, 1993, Ser. No. 31,646

Claims priority, application France, Mar. 24, 1992, 92 03529

Int. Cl.^{6} F41G *1/46*

U.S. Cl. 33—233 **8 Claims**



1. A rotating-wing aircraft provided with a gunsight device, said aircraft having axes of yaw, roll, and pitch and a rotor having an axis and a hollow rotor hub, on which there are radially mounted blades, and which is connected to a main transmission box by a drive shaft coaxial with the rotor of the aircraft,

said gunsight device comprising

a nonrotating gunsight head mounted, by means of a support having a base, at the free upper end of a nonrotating mast arranged coaxially inside said hub and said drive shaft of the rotor, the other end of which mast is fixed into the main transmission box,

a rolling-contact bearing coaxial with the rotor axis between said hub and said mast,

suspension means, intended to filter out the excitations in roll and in pitch to which said gunsight head is subjected, between the base of the support of the gunsight head and upper end of the mast,

said suspension means comprising a swivel in the form of a spherical zone whose center is situated on the axis of the rotor and flexible material fixed between two internal and external reinforcements, said external reinforcement being securely fastened to the base of the support of the gunsight head and said internal reinforcement being securely fastened to the upper end of the mast,

said swivel being coupled to a membrane in the form of a circular ring in a plane substantially parallel to the plane of the rotor, fixed at its internal periphery, to the upper end of the mast and at its external periphery, to the base of the support of the gunsight head,

said membrane being rigid in its own plane in order to transmit moments about the axis of yaw and coplanar forces, but, by virtue of its flexibility in flexion, permitting angular oscillations about the axes of roll and of pitch, and displacements along the axis of yaw permitted by the relative axial flexibility of said swivel.

5,461,797

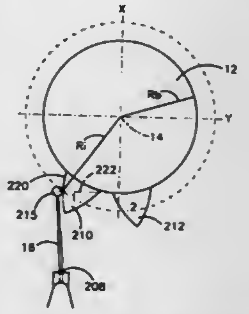
OBJECT MEASURING SYSTEM

Tony A. Royer, and Mark Cowan, both of West Alexandria, Ohio, assignors to M&M Precision Systems Corporation, West Carrollton, Ohio

Filed Apr. 19, 1994, Ser. No. 230,332

Int. Cl.^{6} G01B *5/03;5/16*

U.S. Cl. 33—501.7 **5 Claims**



1. A monitoring system having a spherical stylus that can be moved along a controlled travel path to bring the stylus into contact with an object to determine a shape of the object comprising:

a) a base having a generally level support surface for mounting structure supporting a spherical stylus having a curved object contacting surface for movement along a travel path;

b) a moveable frame having an arm that extends away from said frame and supports the stylus to orient and position the stylus relative to the base;

c) track means supported by the base for defining a three-dimensional travel path for the frame and attached stylus;

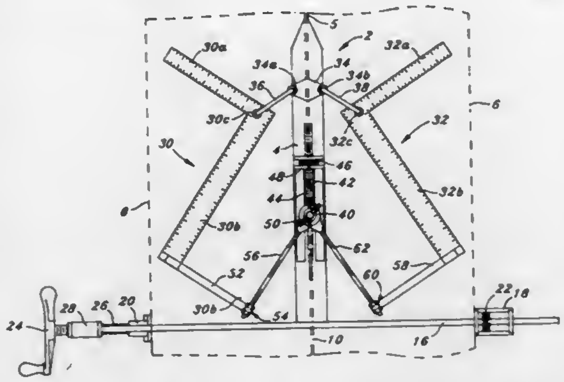
d) a frame drive system for moving the frame and attached stylus on the track means;

e) an object drive motor and support coupled to the object drive motor for rotating the object about a rotation axis relative to the base; and

f) a controller for activating the frame drive system and object drive motor to repeatedly bring the stylus into contact with both right and left surfaces of a number of repeating structures around a circumference of the object as the object drive motor circumferentially orients the object, said controller including a control program for first positioning a reference point of the spherical stylus and rotating one surface of a first repeating structure into contact with the object contact surface to calculate a series of reference positions of right and left surfaces of the repeating structures based on a desired object shape, and then alternately activating the frame drive system to shift the spherical stylus back and forth on opposite sides of a radial centerline passing through the rotation axis an amount based on the size of the spherical stylus and moving the spherical stylus into and out of gaps between the repeating structures to contact left and right surfaces as the controller intermittently rotates the object through one rotation to determine contact positions on left and right surfaces of said repeating structures.

5,461,798
STAIR STRINGER LAYOUT JIG
Faustino A. Ribeiro, 795 Baldwin St., Waterbury, Conn. 06706
Filed Nov. 9, 1994, Ser. No. 336,480
Int. Cl.^{6} B43L *7/12;13/02*

U.S. Cl. 33—562 **5 Claims**



1. A stair stringer layout jig adapted to receive a pair of stair stringers disposed side-by-side adjacent one another, said jig comprising:

a jig base having means for locating said base and between said stringers,

means for clamping said base and said stringers together,

a pair of carpenter's squares, each having two legs joined at an intersection, each of said squares disposed symmetrically in mirror relationship with respect to the other square, and disposed on opposite sides of said base above one of said stringers,

a pair of support members attached between said base and respective intersections of said squares and arranged to allow the legs of the squares to pivot about their respective intersections, and

common adjusting means disposed on said base and connected to said squares, and adapted to simultaneously pivot said carpenter squares in opposite directions about their respective intersections,

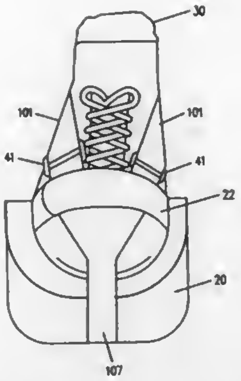
whereby said legs may be used to lay out stair riser and stair tread locations, which may be simultaneously and identically varied in mirror relationship on both of said stringers.

5,461,799
FRONTAL SOLE EXERCISE DEVICE
John Y. Kim, Palo Alto, Calif., assignor to Metapro, Mountain View, Calif.
Continuation-in-part of Ser. No. 65,314, May 20, 1993, Pat. No. 5,339,542. This application Aug. 30, 1993, Ser. No. 115,169
Int. Cl.^{6} A43B *3/18*

U.S. Cl. 36—7.2 **6 Claims**

1. A frontal sole exercise device for removably coupling to footwear, the footwear having an outsole, a heel, a vamp, a backstay, and a tip, the device comprising:

a platform having a semi-circular-like shaped wall, the wall defining a footbed for receiving the outsole of the footwear, the platform of sufficient thickness for elevating the heel off the ground;



a Y-shaped strap attached to the platform, one end of the Y-shaped strap attached to the platform for a frontal coincidence with the tip of the footwear and a front tip of the platform, ends opposite the one end of the Y-shaped strap being positioned on opposite sides of the footwear with the one end of the Y-shaped strap being directly adjacent to an exterior surface of the wall;

two lower anchor straps disposed apart from one another being attached to the platform, the two lower anchor straps being positioned on opposite sides of the footwear;

a K-shaped strap, a first two ends of the K-shaped strap for attachment to the ends opposite the one end of Y-shaped strap, a second two ends of the K-shaped strap for attachment to respective ends of the two lower anchor straps, the K-shaped strap being positioned around the back stay and along opposite sides of the footwear;

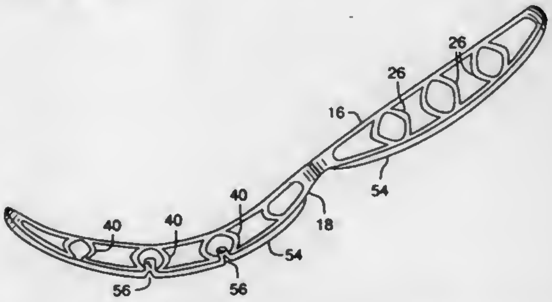
two securing straps attached on opposite sides of the footbed and adjacent to the wall, the two securing straps being positioned on opposite sides and on top of the footwear; and

a plurality of means for attaching the first two ends of the K-shaped strap to the ends opposite the one end of the Y-shaped strap, for attaching the second two ends of the K-shaped strap for attachment to the respective ends of the two lower anchor straps, and for attaching ends of the securing straps to one another;

the Y-shaped strap attached to the platform and to the K-shaped strap for limiting displacement of the tip from the wall owing to rearward movement of the footwear.

5,461,800
MIDSOLE FOR SHOE
Simon Luthi; Xavier Kälin, both of Lake Oswego, Oreg.; Wolfgang Scholz, Lonnerstadt, Germany, and Edgar Stüssi, Schlieren, Switzerland, assignors to adidas AG, Herzogenaurach, Germany
Filed Jul. 25, 1994, Ser. No. 280,208
Int. Cl.^{6} A43B *13/18*

U.S. Cl. 36—28 **2 Claims**



1. A sole for an athletic shoe, comprising:

(a) an elongate, flexible top plate having a forefoot portion, a heel portion, and a midfoot portion, the top plate having a upper surface and a lower surface, the top plate further having a medial margin and a lateral margin;

(b) at least one tube located on the lower surface of the top plate along the heel portion and having a major axis along a center of an opening of the tube and wherein the tub is integrally formed with the top plate;

(c) at least one elongate tube located on the lower surface of a top plate along the forefoot portion and having a longitudinal axis along a center opening of the tube wherein the tube is integrally formed with the top plate;

(d) a flexible bottom plate integrally formed with the tubes and the top plate and arranged so that the at least one forefoot tube is located between the top plate and the bottom plate along the forefoot portion, and the at least one heel tube is located between the top plate and the bottom plate along the heel portion, and the top plate and the bottom plate are in integral contact at the midfoot portion; and

(e) an undersole fixedly connected to the bottom plate and including an expansion joint that is located coincident with a slit-shaped aperture located along the length of the at least one forefoot tube.

5,461,801

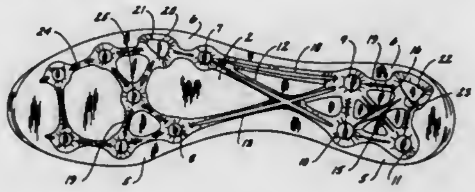
CLEATED ATHLETIC SHOE WITH CRISSCROSS ARCH REINFORCEMENT

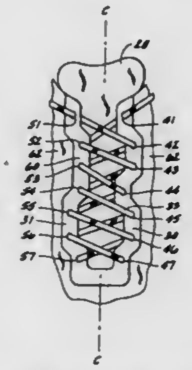
Graeme Anderton, 7862 SW. 27th, Portland, Oreg. 97219

Filed Aug. 18, 1993, Ser. No. 108,432

Int. Cl.^{6} A43B *11/00;5/02;5/00;* **A44B** *9/00*

U.S. Cl. 36—114 **17 Claims**





1. A cleated athletic shoe having an upper and a sole, the sole having an inner and an outer edge and an arch region as the shoe is worn and the sole comprising:

a plurality of forward cleats, including a rearwardmost forward outer cleat adjacent the outer edge of the sole and a rearwardmost forward inner cleat adjacent the inner edge of the sole;

a plurality of rearward cleats, including a forwardmost rearward outer cleat adjacent the outer edge of the sole and a forwardmost rearward inner cleat adjacent the inner edge of the sole; and

a crisscross arch reinforcement on the sole consisting only of slender first and second intersecting arch ribs having an intersection in the arch region, said first arch rib extending in a straight line between said rearwardmost forward outer cleat and said forwardmost rearward inner cleat and said second arch rib extending in a straight line between said rearwardmost forward inner cleat and said forwardmost rearward outer cleat, said first and second arch ribs having a relatively narrow lateral thickness as compared to the length of said arch ribs and said intersection having a relatively narrow lateral thickness as compared to the length of said arch ribs such that the arch ribs form an X-shaped arch reinforcement to provide added support to the arch region without excessively increasing the weight and bulk thereof, said arch ribs of said X-shaped reinforcement being slender and being raised from the sole such that said reinforcement penetrates the ground when downward pressure is applied as the shoe is worn and thereby provides lateral traction and supplements traction provided by the cleats.

5,461,802

SKI BOOT WITH ADJUSTABLE SLANT OF THE UPPER

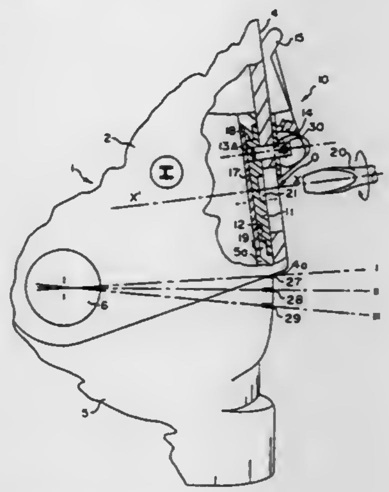
Jean Paris, Sevrier, and Jean-Pierre Chemello, Annecy-Le-Vieux, both of, France, assignors to Salomon S.A., Metz-Tessy, France

Filed Dec. 29, 1994, Ser. No. 365,794

Claims priority, application France, Jan. 12, 1994, 94 00402

Int. Cl.^{6} A43B *5/04*

U.S. Cl. 36—121 **10 Claims**



1. An alpine ski boot comprising:

a rigid shell base overlaid by an upper, the upper having a front portion and a rear portion provided in one or several pieces, the rear portion of said upper being at least partially pivotal in a rear-to-front and/or front-to-rear direction with respect to the shell base and including a device for latching and unlatching the upper with respect to the shell base, accessible from the exterior of the boot via a control member, the latched position of the latter, corresponding to an initial adjustable reference advance position, from which the upper is capable of an angular clearance along an amplitude predetermined with respect to the shell base;

wherein the latching and unlatching device includes a multi-position member capable of being displaced angularly about a longitudinal axis (X–X') of the shell base in a corresponding co-axial housing arranged in a rear portion of the shell base, and including a plurality of orifices radially off-centered with respect to the virtual center (0) of the multi-position member according to different radius values (r, r1, r2), such that one of the orifices, chosen as a function of a desired initial advance of the upper, can be brought into a vertical axis (Y–Y') in order to coincide with a latching finger affixed to the upper, the latching finger being activated from the exterior of the boot through a wall of the upper by the control member in order to cooperate positively with the chosen orifice of the multi-position member during an active phase of skiing or separated therefrom during a resting or walking phase.

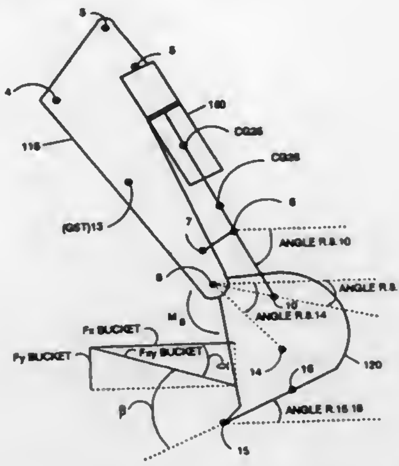
5,461,803

SYSTEM AND METHOD FOR DETERMINING THE COMPLETION OF A DIGGING PORTION OF AN EXCAVATION WORK CYCLE

David J. Rocke, Eureka, Ill., assignor to Caterpillar Inc., Peoria, Ill.

Filed Mar. 23, 1994, Ser. No. 217,034
Int. Cl.⁶ E02F *3/32*

U.S. Cl. 37—443 **12 Claims**



1. A control system for automatically controlling a work implement of an excavating machine through a machine work cycle, the work implement including a boom, stick and bucket, each being controllably actuated by at least one respective hydraulic cylinder, the hydraulic cylinders containing pressurized hydraulic fluid, the control system comprising:

position sensing means for producing respective position signals in response to the respective position of the boom, stick and bucket;

pressure sensing means for producing respective pressure signals in response to the associated hydraulic pressures associated with the boom, stick, and bucket hydraulic cylinders;

means for receiving the position and pressure signals, and producing a command signal;

actuating means for receiving the command signal and controllably actuating predetermined ones of the hydraulic cylinders to perform the work cycle; and

logic means for determining the external force applied to the bucket and the angle of the bucket force, comparing the angle of the bucket force to a predetermined value, and responsively determining when a digging portion of the work cycle is complete.

5,461,804

IMAGE SUPPORT APPARATUS

Raymond C. Perkins, Jr., 1730 N. Clark St., Apt. 714, Chicago, Ill. 60614

Filed Jul. 14, 1993, Ser. No. 91,768
Int. Cl.⁶ G09F *1/12*

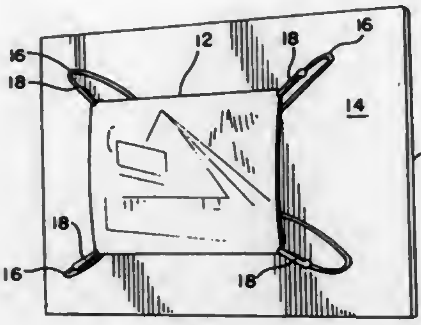
U.S. Cl. 40—152.1 **2 Claims**

1. An apparatus for display of a substantially planar object, the apparatus comprising:

a base having a front surface and a back surface, and a peripheral edge extending therearound;

means for supporting the object in spaced relationship with said front surface of said base, said means for supporting being connected, at one end, to said base at a point and protecting outwardly from said base, said means for supporting includes a flexible wire looped through an aperture formed in said base and said flexible wire attached on said back surface of said base; and

means for holding the object, said holding means being attached to the other end of said means for supporting.



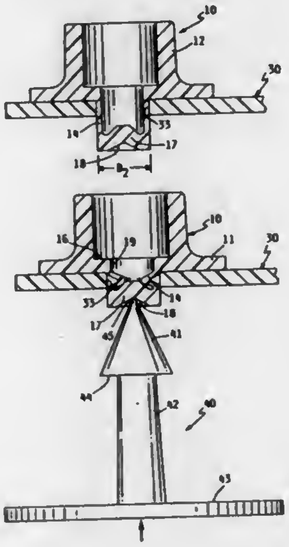
5,461,805

PANEL INSERT FOR TEMPORARY ATTACHMENT TO ANIMAL IDENTIFICATION TAGS

George N. Johnson, Stillwater, Minn., assignor to Fearing Manufacturing Co., Inc., St. Paul, Minn.

Filed Oct. 12, 1993, Ser. No. 134,651
Int. Cl.⁶ G09F *3/00*

U.S. Cl. 40—301 **22 Claims**



1. An animal-identification component, comprising:

a flexible and deformable panel having a first flexural modulus for carrying animal-identification information, said panel sufficiently flexible and deformable to flex and bend to minimize snagging of the panel on objects which contact the panel, said panel including an opening therein; and

a panel retainer of a second flexural modulus for engagement with the panel, said panel retainer having a flange with an opening therein, said panel retainer made of material sufficiently rigid to resist flexing and deforming of said panel retainer, said flange having a face for engaging a sufficiently large portion of the flexible and deformable panel to prevent the panel retainer from being drawn through the opening in the flexible and deformable panel, said panel retainer having a hollow frangible neck extension with a peripheral wall for frictionally engaging the opening in the panel to maintain said panel and said panel retainer as a unit prior to attachment of the panel to an animal whereby the peripheral wall of the neck extension is adapted to deform when a stud is inserted therethrough.

5,461,806

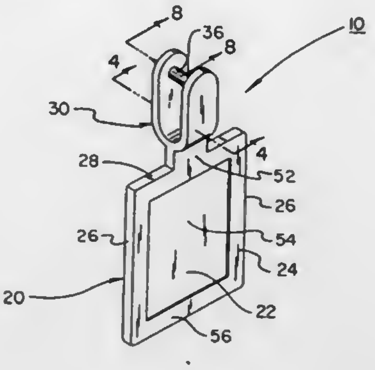
REFLECTING ANIMAL EAR TAG

Charles E. Bristow, Jr., HC 70 Box 4529, Sahuarita, Ariz. 85629

Filed Jul. 15, 1994, Ser. No. 276,114

Int. Cl.^{6} G09F *3/00*

U.S. Cl. 40—301 **1 Claim**



1. A reflecting animal ear tag for providing a light reflecting ear tag to protect open range cattle against being struck by a vehicle at night by improving visibility of the cattle and also providing an ear tag which may be used in the conventional manner to identify and record information about the cattle, the reflecting animal ear tag comprising:

a rectangular tag holder, formed as a frame of resilient plastic and having integral channel shaped top, bottom, and side members opening inwardly toward a rectangular open center region, the tag holder being reflective to the visible light normally emitted by vehicular headlamps;

an ear attachment clip comprising a resilient U-shaped clip body with an arcuate portion integrally attached to the top of the tag holder with a rectangular connecting web extending downwardly from the arcuate portion of the clip body, a hole through a first clip arm proximal an upper end thereof, a post extending inwardly toward the first clip arm from a second clip arm such that the free end of the post may engage with and extend through the hole, the post having a pointed free end with a plurality of longitudinally spaced apart annular barbs formed thereon whereby the post may be driven through an ear of an animal such that the ear is sandwiched between the clip arms with the post extending through the ear and also extending through the hole of the first clip arm, each clip arm barb having a plurality of longitudinal radially spaced apart slots formed therethrough whereby the barb will compress during the ear piercing operation and also when moving through the hole of the first clip arm and then expand upon exiting the hole to lock the post and clip to the ear of the animal; and

a rectangular rigid tag insert formed of plastic and disposed within the tag frame such that the edges of the insert are engaged with the channel openings of the frame members whereby the insert is removably held within the frame, the insert being removable from the frame by deforming the resilient frame members, the insert having surface properties to permit writing thereon for recording information relating to the particular animal being tagged;

inserts having a variety of surface colors whereby cattle may be color-coded; and

frames having a variety of colors whereby cattle may be color-coded.

5,461,807

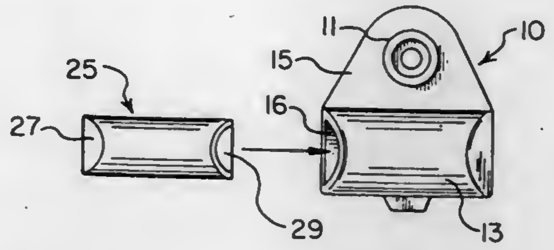
ANIMAL EARTAG ELECTRONIC TRANSPONDER

George N. Johnson, Stillwater, Minn., assignor to Fearing Manufacturing Company, South St. Paul, Minn.

Filed Apr. 13, 1994, Ser. No. 227,163

Int. Cl.^{6} A01K *11/00*

U.S. Cl. 40—301 **13 Claims**



1. An animal eartag for use in electronically identifying an animal, comprising:

a body member having an ear attaching structure at one portion thereof, and having a first cavity at a second portion thereof;

said first cavity having an open end and a closed end;

an insert member in said first cavity;

said insert member being dimensionally shaped to closely fit into said open end of the first cavity so as to substantially close said open end of said first cavity;

a second cavity in said insert member;

said second cavity having an open end and a closed end;

said insert member being placed in said first cavity with said open end of said second cavity being positioned adjacent the closed end of said first cavity; and

an electronic transponder positioned inside said second cavity.

5,461,808

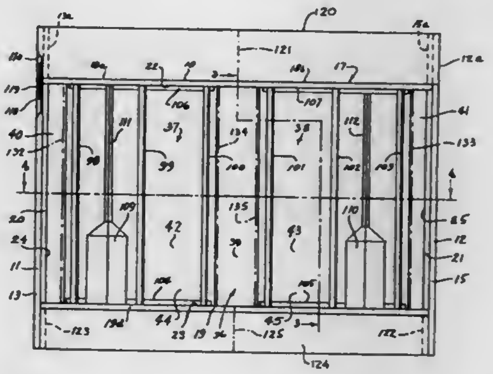
TABLE TOP BACKLIT DISPLAY

Robert W. Fritts, 1575 N. Second St., Stillwater, Minn. 55082

Filed Feb. 8, 1993, Ser. No. 14,809

Int. Cl.^{6} G09F *13/04*

U.S. Cl. 40—571 **27 Claims**



27. A backlit display comprising in combination a rectangular frame having frame members provided with generally coplanar front surfaces and which define a rectangular opening; an articulated lighting assembly having a plurality of pivotally connected trays, said assembly being readily removably connected as a unit within said frame and comprising a plurality of rectilinear tubular lamps mounted on said trays in substantially equally spaced parallel relation; and a rectangular substantially one piece light transmissive image bearing display panel extending across said opening and having marginal portions readily removably connected in laminate relation to the coplanar front surfaces of said frame members.

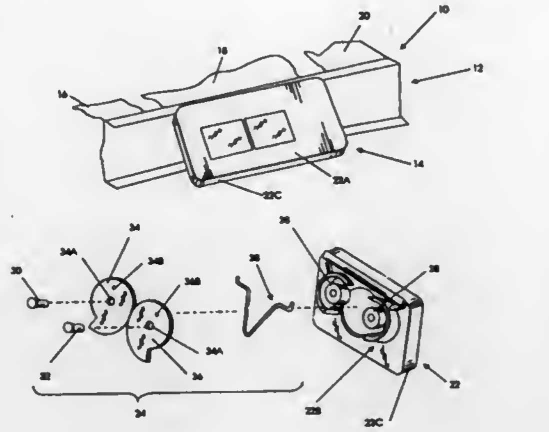
5,461,809

DUAL CAM MOUNTING MECHANISM FOR ELECTRONIC SHELF EDGE LABELS

Roger G. Fowler, Apex, and Richard H. Harris, Raleigh, both of N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 2, 1994, Ser. No. 284,335
Int. Cl.^{6} G09F *3/18*

U.S. Cl. 40—642 **18 Claims**



9. An information device for mounting on a shelf channel to provide shoppers with product information comprising:

- a housing;
- a module for displaying product information mounted in said housing;
- a pair of cams rotatably mounted in spaced relation to one surface of the housing; and
- a positioning means coupled to the pair of cams; said positioning means applying torque to keep the pair of cams in an under-center position relative to a reference surface on each one of said pair of cams and being responsive to a force applied in a first direction to rotate the pair of cams until the cams are brought into non-slidable relation with the shelf channel.

5,461,810

SELF-FRAMING DISPLAY HOLDER FOR FLAT OBJECTS

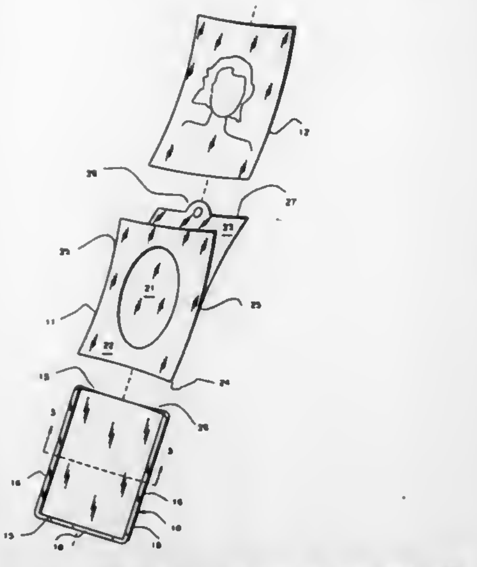
J. Thomas Goserud, 13818 Sutters Mill Rd., Midlothian, Va. 23112

Filed May 31, 1994, Ser. No. 251,309
Int. Cl.^{6} G09F *3/18*

U.S. Cl. 40—661 **10 Claims**

1. A self-framing holder for protectively displaying flat objects, said holder comprising:

a) a jacket formed from two identical sheets of semi-rigid transparent plastic bounded by four straight edges in a rectangular configuration elongated upon a center axis, said sheets disposed one atop the other and sealed together along three edges by bonding to intervening plastic spacer strips of uniform thickness disposed contiguously with said three edges and parallel thereto, whereby unsealed fourth edges define an entrance opening to an enclosure bounded by said sheets and spacer strips, said sheets being bowed into contact with one another upon said axis, and



b) a pouch-like retainer member comprised of front and rear panels of compliant thin sheet material of rectangular outer contour disposed one atop the other and hingedly joined at one edge considered a lower edge, said front panel having an aperture centered upon said axis, said retainer member dimensioned such as to slidably insert through said opening and fill said enclosure.

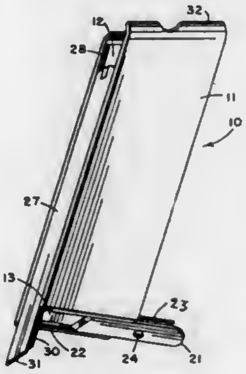
5,461,811

GUN MAGAZINE APPARATUS AND METHOD

Jonathan A. Clener, 104 La Riviere Rd., Cocoa Beach, Fla. 32931

Filed Oct. 24, 1994, Ser. No. 328,166
Int. Cl.^{6} F41A *9/65*

U.S. Cl. 42—50 **13 Claims**



1. A magazine comprising:

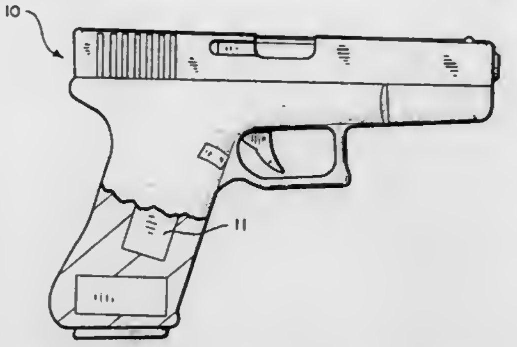
- a magazine body machined from a block of aluminum alloy and having an open edge having a pair of grooves along the inside thereof and an open bottom having a pair of inside grooves along the inside thereof;
- an edge plate slidably attachable to said magazine body in said pair of grooves along the inside of said magazine body inside edge to cover the open edge thereof;
- a floor plate slidably attachable to said magazine body in said pair of grooves along the inside of said magazine body open bottom to cover the open bottom thereof and one end of said edge plate; and

a spring positioned inside said magazine body for urging bullets in the magazine body upward in the magazine, said spring having a cartridge follower on one end thereof and a spring base plate on the other end thereof yieldably connected to said floor plate to lock said floor plate in place on the bottom of said magazine body whereby a magazine is formed of a plurality of interconnecting parts locking together.

5,461,812
METHOD AND APPARATUS FOR A WEAPON FIRING SAFETY SYSTEM

Emeric S. Bennett, 12149 Fowlers Mill Rd., Chardon, Ohio 44024

Filed Nov. 16, 1994, Ser. No. 340,529
Int. Cl.⁶ F41A *17/06;17/46*
U.S. Cl. 42—70.11 **16 Claims**



1. A safety apparatus for a weapon to prevent firing of the weapon by an unauthorized user, comprising:

a weapon having a weapon circuit, a filter means and a safety means in communication with the filter means, the safety means having a normally disarmed position and an armed position; and[,lf the safety means adapted for moving from the normally disarmed position to said armed position upon a signal from the filter means;

an element adapted to be worn by a user of the weapon, the element having a circuit, a first means for energizing the element circuit when the element is worn by a user of the weapon and a second means for energizing the element circuit concomitant with proximity of the element to the weapon;

a first communication means in the weapon adapted to elicit a response from the element;

a second communication means associated with the element, the second communication means comprising a transponder adapted to receive a signal from the weapon; and; to generate a transponder signal back to the weapon;

a programming means for coding an identification number in the transponder and the filter means;

said filter means having a recognition means responsive to the coded identification number in the transponder signal, and a means for generating an output signal to said safety means for release of the safety means to the armed position.

5,461,813
AIR COIL

Anthony H. Mazzola, P.O. Box 424, Birmingham, Ala. 35124

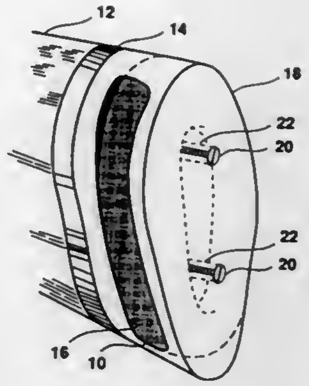
Filed Aug. 13, 1993, Ser. No. 105,678
Int. Cl.⁶ F41C *23/08*
U.S. Cl. 42—74 **2 Claims**

1. A recoil pad for a shoulder gun comprising:

a flat plate attached to the butt of said gun;

a surrounding elastic cover adhered to the peripheral edge of said plate;

a resilient deformable bladder surrounded by said elastic cover and located between said plate and said cover; and;

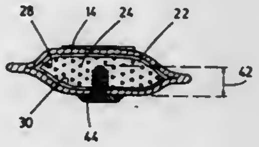


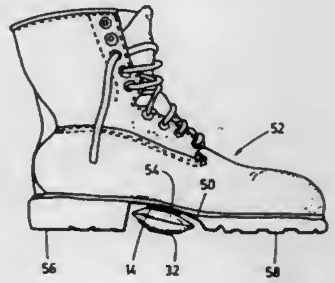
a valve formed in said resilient deformable bladder capable of admitting and releasing pressure in said bladder.

5,461,814
SCENT DISPENSER

David R. Reid, 561 Commanche Road, Mississauga, Ontario, Canada, and James Cuddy, 14 McGill Street Box 242, Marmora, Ontario, Canada

Filed May 3, 1994, Ser. No. 237,213
Int. Cl.⁶ A01N *25/00*
U.S. Cl. 43—1 **15 Claims**

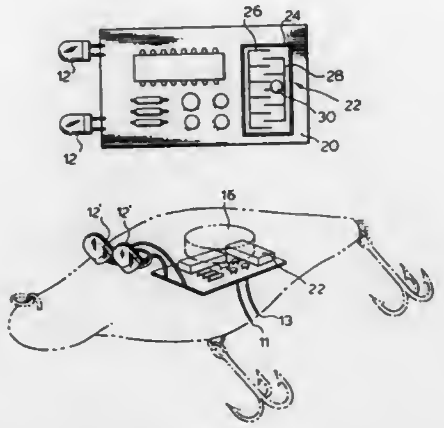




1. A scent dispenser including: a casing; means for removably attaching said casing to the sole of footwear, said casing flexing when compressed by the force exerted upon it by the footwear upon contact with the ground and returning to its unflexed condition when the compressing force is removed; a cavity disposed within and surrounded by said casing for receipt of scented liquid, said casing having at least one aperture communicating said cavity with the atmosphere outside the dispenser and being alternately compressed and relaxed upon flexing and unflexing, respectively, of said casing such that scented liquid is expelled from said cavity through said aperture to the atmosphere when said casing is flexed and is substantially confined within said cavity when said casing is unflexed; a liquid-absorbent filler disposed within said casing; and a stopper removably received in an orifice in said casing, said stopper including an external head for contact with the ground and and internal shank extending into said cavity to engage an interior wall when said casing is compressed to control the compression of said casing.

5,461,815
FISHING LURE

Nicholas A. Rodgers, c/o Shaw & Co. SJO 892, P.O. Box 025216, Miami, Fla. 33102-521
Continuation-in-part of Ser. No. 72,390, Jun. 7, 1993, Pat. No. 5,330,282. This application Apr. 28, 1994, Ser. No. 234,110
Int. Cl.^{6} A01K *85/00*
U.S. Cl. 43—17.6 **8 Claims**

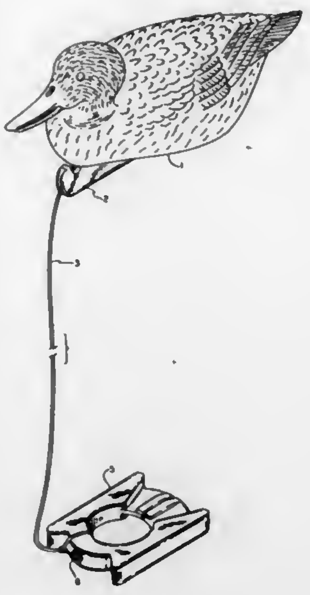


1. Fishing lure comprising:
- a lure body,
- a power source,
- a circuit including timing means for timing an interval,
- a connection forming part of said circuit including terminals adapted to be connected and disconnected,
- at least one light source having ON and OFF states, said circuit being adapted to respond to the change of said connection means to connected state when said light source is OFF, to turn said light ON and to turn it OFF after said interval,
- a means for connecting said terminals comprising a conducting article having a defined locus of movement and movable freely and rattling on normal motion of said lure through the water and adapted during such movement to connect and disconnect said terminals.

5,461,816
DECOY ANCHOR

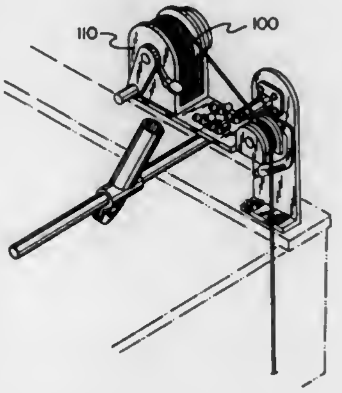
Richard S. Gazalski, P.O. Box 1208, Henryetta, Okla. 74437
Filed Mar. 16, 1994, Ser. No. 213,524
Int. Cl.^{6} A01M *31/06*
U.S. Cl. 43—3 **1 Claim**

1. A waterfowl decoy anchor adapted to be received on the support for the weighted keel of a floating waterfowl decoy consisting of a completely enclosed, elongated hollow body having a thickness dimension approximately the same as the weighted keel support of a waterfowl decoy; said elongated hollow body being generally rectangular in plan view and containing a longitudinal slot opening extending lengthwise of said anchor from the shortest dimension of said rectangular hollow body, said slot edges containing means for releasably engaging the keel support to thereby hold the anchor firmly to the keel support, said shortest dimensions of said elongated, rectangular hollow body containing recesses provided at locations to receive the wrapping of anchor line around the longest dimension of the anchor without interfering with the means for releasably engaging the keel support, and said anchor further containing a hole and removable plug means received in the hole for access to the interior of the elongated, hollow body to enable the interior of the hollow body to be provided with ballast for weighting the anchor to a sufficient weight for it to sink.



5,461,817
FISHING ROD JIGGING APPARATUS

Glenn A. Flood, Box 1131, Gaylord, Mich. 49735
Filed Jan. 18, 1994, Ser. No. 181,793
Int. Cl.^{6} A01K *97/10*
U.S. Cl. 43—19.2 **1 Claim**



1. A new and improved apparatus for supporting and jigging fishing lines comprising, in combination:
- a jigging mechanism having an elongated jigging bar positioned in a linear configuration and having free ends, bearing structures positioned adjacent to the stern of a boat to support the free ends, an oscillating plate having a first aperture secured with respect to one free end of the jigging bar and a second aperture remote therefrom for reciprocating the jigging bar in a curved fashion about the axis of the first aperture, and a plurality of rod holders removably coupled to the jigging bar, each adapted to hold a fishing rod therein;
- a pair of vertical support braces having an upper extent and a lower extent, each brace coupled to a bearing structure near the upper extent thereof with the lower extent adapted to be coupled to the stern of a boat,
- a motor secured to one of the support braces with an output shaft rotatably disposed therethrough for providing rotational power to the output shaft;
- a cam mounted for rotation with the output shaft of the motor, the cam having a cam shaft offset from the axis of rotation of the output shaft;
- operator-controlled power delivery means adapted to be coupled to a battery on a boat for providing power to the motor;

switch means coupled between the motor and power delivery means for activating and inactivating the motor at the discretion of an operator;

a J-shaped bracket having a long linear extent terminating in a power input end, a curved section terminating at a power output end, an intermediate aperture constituting a pivot point,the pivot point being pivotally coupled to the vertical support bracket, an aperture in the linear extent of the J-shaped bracket with coupling means extending therefrom for coupling with the cam shaft for effecting a rocking motion of the J-shaped bracket about the pivot point, and a third aperture adjacent to the power output end of the curved section with pivoting means pivotally coupling the third aperture to the second aperture of the oscillating plate, whereby rotation of the cam will oscillate the J-shaped bracket as well as the oscillating plate and provide axial rotation of the jigging bar to jig fishing rods placed in the rod holders;

a spool of downrigger wire secured positionable with respect to the rear of the boat and mounted with respect to a vertical brace;

operator-controlled drive means for reeling out and reeling in downrigger wire from the spool;

a weight adapted to be coupled to the free end of the fishing line for extending downwardly from the rear of the boat; and

a release secured to the wire adjacent to the weight for allowing the passage of fishing line therethrough from a rod supported in a rod holder such that the free end of the fishing line and bait coupled thereto are positioned at a predetermined distance beneath the surface of the water for trolling as a function of the extent of the downrigger wire reeled out from the spool.

5,461,818
SPINNING ROD ASSEMBLY

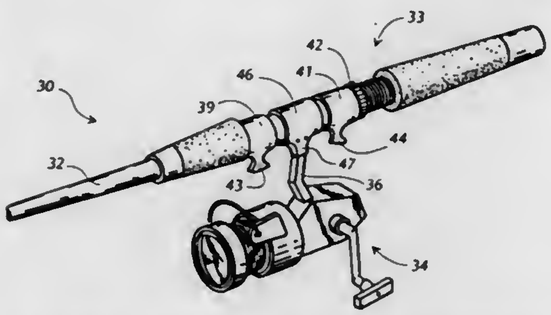
Charles W. Balkcom, Rte. 4, Box 1125, Macon, Ga. 31201

Continuation of Ser. No. 716,741, Jun. 14, 1991, Pat. No. 5,317,829, which is a continuation of Ser. No. 452,104, Dec. 18, 1989, abandoned. This application Jun. 6, 1994, Ser. No. 254,254

The portion of the term of this patent subsequent to Jun. 7, 2011, has been disclaimed.

Int. Cl.^{6} A01K *97/00*

U.S. Cl. 43—23 **3 Claims**



1. In a fishing rod assembly of the type having an elongated rod with a handle at one end for grasping by an angler, said handle having a top and a bottom and being adapted to receive a reel assembly for containing, paying out, and retrieving fishing line during casting and retrieving by the angler, the improvement thereof comprising a pair of finger supports projecting downwardly from said handle, each of said finger supports extending from said handle a distance at least equal to the width of an angler's finger, said finger supports being spaced apart along the length of said handle a distance sufficient to receive one of angler's finger between said finger supports when the angler grasps the fishing rod assembly by the handle for casting and retrieving, whereby one of an angler's fingers becomes captured between the finger supports when the angler grasps the spinning rod assembly loosely about the handle thereby restricting longitudinal movement of the captured finger relative to the handle to facilitate comfortable and controlled casting and to distribute longitudinal forces generated in the rod among more than one of the angler's fingers.

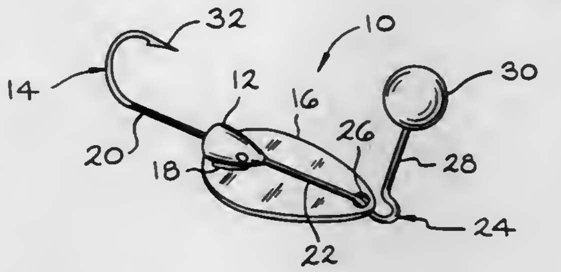
5,461,819
FISHING LURE WITH DIRECTIONALLY CONTROLLABLE REVERSE SWIMMING FEATURE

Walter Shindledecker, 132 Alpine Dr., Findlay, Ohio 45840

Filed May 24, 1994, Ser. No. 248,412

Int. Cl.^{6} A01K *85/00*

U.S. Cl. 43—42.13 **8 Claims**



1. A fishing lure comprising:

a generally planar wing having a rear portion and a front portion,

a lure body connected to said wing and positioned adjacent to said rear portion thereof, said lure body having a weight,

at least one hook connected to and supported on the lure,

a buoyant member having a weight which is less than the weight of said lure body, and

an arm connected to the lure and extending generally upwardly from the wing near said front portion thereof, said buoyant member being supported on said arm and said arm being supported relative to said wing so that, when the lure is in the water on a slack line, said buoyant member is supported above said wing and said wing is positioned so that it causes the lure to glide in a reverse direction with a rate of descent, said arm being adjustable so that it is operable to support said buoyant member in a plurality of positions, relative to said wing, including a first, neutral position and a second, non-neutral position,

wherein the lure reverse glides in a generally straight path when said buoyant member is supported in said first, neutral position and wherein the lure glides in a generally arcuate path when said buoyant member is supported in said second, non-neutral position.

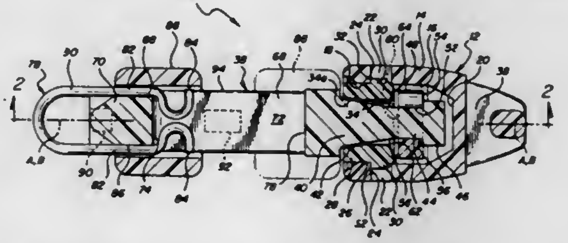
5,461,820
SWIVEL CONSTRUCTION

Bret S. Sorola, 1832 W. Norfolk Dr. #2, Essexville, Mich. 48732

Filed Jun. 1, 1994, Ser. No. 252,343

Int. Cl.^{6} A01K *91/00*

U.S. Cl. 43—43.1 **15 Claims**



1. A swivel construction comprising an elongate body member having an enlargement at one end; a housing member having a cavity in which said one end of said body member is accommodated; journal means in said cavity encircling said body member;

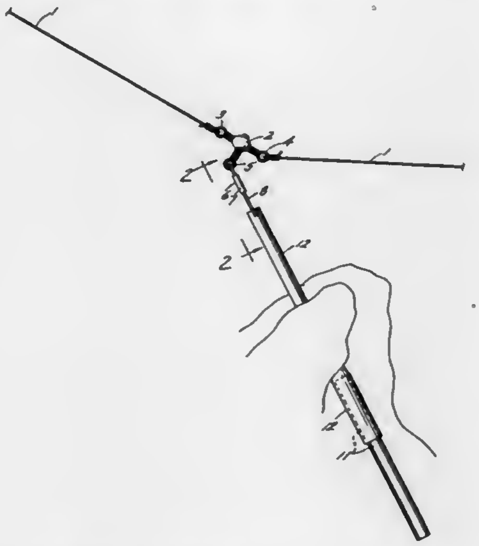
retaining means carried by said body member between said journal means and said enlargement; latch means cooperable between said journal means and said housing member for coupling and uncoupling said journal means to and from said housing member; first means carried by said body member at its opposite end for connection to a first fishing tackle element; second means carried by said housing member for connection to a second fishing tackle element, said first and second means being operable to apply a tensile force on said members tending to stress said latch means; and bearing means comprising projections on said retaining means and a conical surface on said journal means engageable by said projections in response to the application of tensile force on said members to resist uncoupling of said latch means from said housing member.

5,461,821
BREAKAWAY FISHING SINKER

Leonard R. Carter, Jr., 1021 Anzio St., Crescent City, Calif. 95531

Filed Oct. 17, 1994, Ser. No. 323,616
Int. Cl.^{6} A01K *95/00*

U.S. Cl. 43—43.12 **4 Claims**



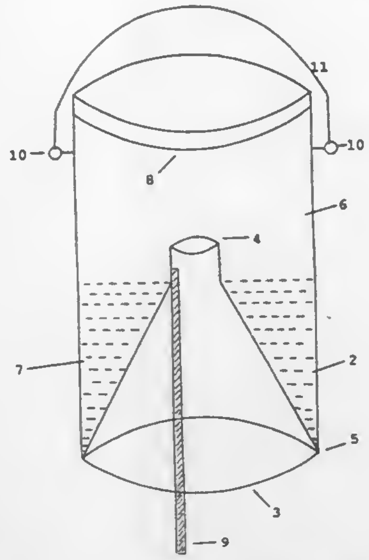
1. A fishing sinker comprising,
a connector for attachment to a fishing line,
a snap having an eye in engagement with said connector and a flexible wire component,
a tubular member of elastomeric material and having a first end and a second end,
an elongate sinker in inserted engagement with said second end of the tubular member,
said wire component in pierced engagement with said first end of the tubular member, and
snagging of the sinker on an obstruction permitting retrieval of the fishing line upon tearing of the elastomeric tubing member by the wire component.

5,461,822
FLY-CATCHER WITH BAIT

Charlie W. Green, 1115 N. Brace Rd., Summertown, Tenn. 38483, and Paul R. Jaco, 2921 Featherston Ave., Wichita Falls, Tex. 76308

Filed May 23, 1994, Ser. No. 247,929
Int. Cl.^{6} A01M *1/02*

U.S. Cl. 43—122 **1 Claim**



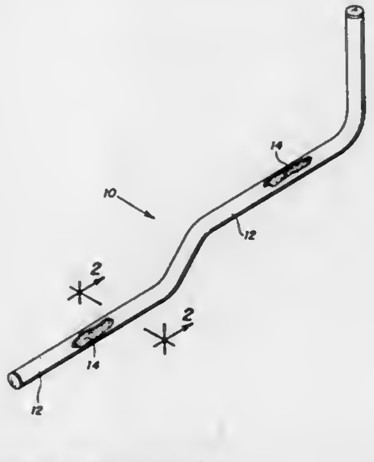
1. A trap for catching flies, said trap comprising a cylindrical clear plastic outer shell having a lower end and an upper end, said trap further comprising a threaded lid mounted on the upper end of said outer shell and a funnel-shaped entryway mounted on the lower end of said outer shell, said entryway extending into said outer shell;
a piece of string attached to an upper portion of said entryway, said string extending from said upper portion of said entry way through said lower end of said outer shell for flies to alight on said string;
attachment means mounted to the trap adjacent the upper end of the outer shell, said attachment means for hanging the trap;
said trap further comprising a bait mixture made up of three parts honey, one part milk, and one part diced apple;
wherein a bait mixture holding space is defined between said outer shell and said funnel-shaped entryway, and said bait mixture is retained in said bait mixture holding space.

5,461,823
VEGETATION BARRIER

Thomas M. Foster, Colchester, Ill., assignor to Composite Manufacturing & Research, Inc., Allen, Tex.

Filed Mar. 28, 1994, Ser. No. 218,365
Int. Cl.^{6} A01G *1/08*

U.S. Cl. 47—33 **3 Claims**



1. A vegetation barrier comprising:
a water permeable container including cloth walls; and
a mixture of salt and flour disposed within said container.

5,461,824

METHOD FOR CONTROLLING TREE GROWTH

Ronald L. Cassell, New Palestine, Ind., assignor to DowElanco, Indianapolis, Ind.

Continuation of Ser. No. 927,081, Aug. 7, 1992, abandoned. This application Aug. 2, 1994, Ser. No. 284,703

Int. Cl.^{6} A01G *29/00;* **A01B** *79/00*

U.S. Cl. 47—57.5 **9 Claims**

1. A method for delivering to the terminal shoots of a tree a growth supressing amount of flurprimidol, which comprises placing an implant below the bark layer of the tree at each of a plurality of sites spaced around the circumference of the trunk of the tree, each implant containing a unit dose of flurprimidol.

5,461,825

POT FOR CULTURING PLANTS

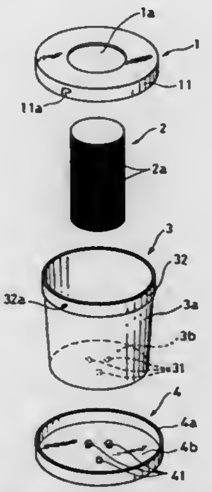
Junko Daimon; Yasuo Takeda, both of Tochigi, and Katsunori Kodama, Tokyo, all of, Japan, assignors to Japan Tobacco Inc., and JT AGRIS Corp., both of Tokyo, Japan

Filed Nov. 24, 1993, Ser. No. 156,715

Claims priority, application Japan, Feb. 1, 1993, 5-006422 U

Int. Cl.^{6} A01G *9/04*

U.S. Cl. 47—71 **15 Claims**



1. A pot for culturing plants comprising a lid having a stem opening at the center, a guide tube having openings for the passage of stem roots, a pot having a side wall and a bottom portion, and a plate, a plurality of openings being provided in the bottom portion of the pot, the plurality of openings remaining open during use of the pot such that liquid can freely enter and exit the pot through the openings, the lid being attachable to an upper edge of the pot and the plate having a plurality of engaging hooks, each of the openings in the bottom portion of the pot receiving one of the hooks to thereby hold the pot to the plate, a space being provided between the hooks and edges of the openings whereby liquid can freely pass through the openings into and out of the pot.

5,461,826

SAFETY DEVICE FOR ELECTRICAL OPENERS FOR A VEHICLE

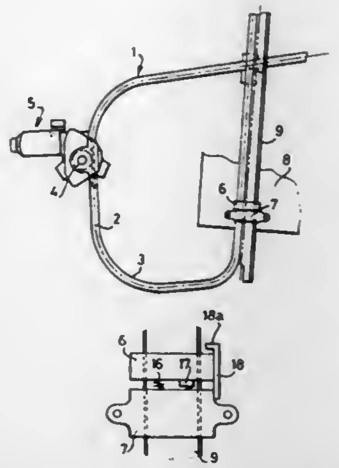
Robert J. Heckel, Cormeilles; Enrico Fin, Paris; Achim R. Gier, Garches, and Pascal Bonduel, Sully S/Loire, all of, France, assignors to Rockwell Body and Chassis Systems, France

Filed Jul. 2, 1993, Ser. No. 87,835

Claims priority, application France, Jul. 10, 1992, 92 08620

Int. Cl.^{6} E05F *15/02*

U.S. Cl. 49—28 **14 Claims**



1. In a safety device for vehicular electrical openers having an electrical motor with an electrical supply circuit, said electrical motor controlled by a switch forming part of said electrical supply for said motor, a movable member driven by a cable, a kinematic chain for driving said cable, and electromechanical coupling and load-detecting means for coupling and detecting a load between a driving element of said kinematic chain and a driven element of said kinematic chain, said driven element fixed to said movable member, said coupling and detecting means effective to automatically uncouple said driving and driven elements from each other in the event said load exceeds a predetermined value, the improvement comprising: a driving slide fixedly attached to said cable, a driven slide fixedly attached to said movable member, said electromechanical coupling and load-detecting means provided between said driving slide and said driven slide and being arranged so as to automatically uncouple said driving slide and said driven slide from each other in the event said load exceeds said predetermined value.

5,461,827

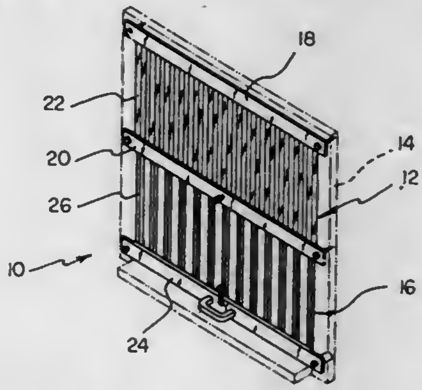
TELESCOPING WINDOW BAR UNIT

Nathan Lofton, 6060 Hwy. 19, Zachary, La. 70791

Filed Sep. 2, 1994, Ser. No. 300,269

Int. Cl.^{6} E06B *3/68*

U.S. Cl. 49—55 **5 Claims**



1. A telescoping window bar unit comprising:

an upper grate assembly means securable across an upper portion of a window for blocking access to said upper portion of said window;

a lower grate assembly means movably mounted relative to said upper grate assembly for blocking a lower portion of said window;

said upper grate assembly means comprising an upper plate securable across said upper portion of said window, a medial plate securable across a medial portion of said window, a plurality of receiving tubes fixedly secured to both said upper plate and said medial plate and arranged in a substantially parallel spaced relationship relative to one another;

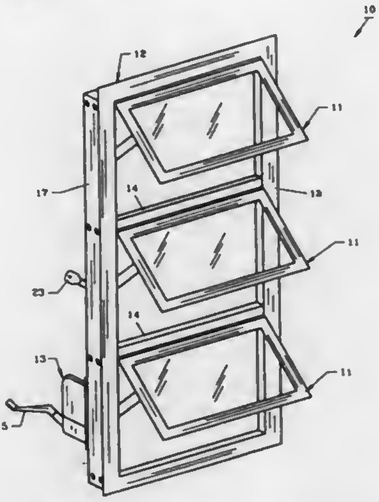
said lower grate assembly means comprising a lower plate, a plurality of telescoping members fixedly secured to said lower plate and extending into said receiving tubes of said upper grate assembly means; and

at least one pin anchor positionable within a bore formed in structure surrounding said window and a locking pin directed through an aperture in said lower plate and releasably engaged to said pin anchor.

5,461,828
AWING WINDOW WITH LOCK

Robert L. Jordal, Rte. 10, Box 351, Winston-Salem, N.C. 27127
Filed Aug. 29, 1994, Ser. No. 297,049
Int. Cl.⁶ E06B *7/086*

U.S. Cl. 49—90.1 **12 Claims**

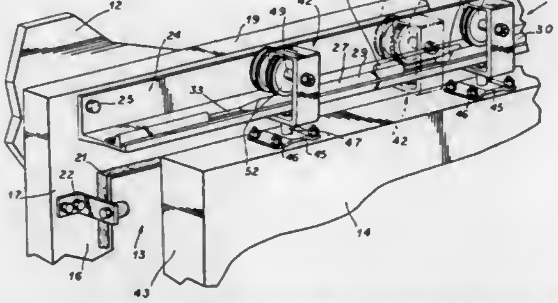


1. An awning window comprising: a jamb member, a slide bar, said slide bar slidably received within said jamb member and in parallel alignment therewith, a window panel pivotally joined to said slide bar, said slide bar defining a latch slot, a rotatable cylinder lock, said cylinder lock mounted on said jamb member, said cylinder lock comprising a rotatable latch, said window panel pivotable from a parallel closed position to an angularly disposed open position with said jamb member, said latch rotatable to engage said latch slot when said window panel is angularly disposed to said jamb member to prevent movement of said slide bar.

5,461,829
TROLLEY RAIL SYSTEM FOR SLIDING DOOR

Eino M. Lehton, and Burl Finkelstein, both of Newnan, Ga., assignors to Kason Industries, Inc., Shenandoah, Ga.
Filed Aug. 29, 1994, Ser. No. 297,167
Int. Cl.⁶ E05D *15/06*

U.S. Cl. 49—409 **11 Claims**



1. A trolley rail system for supporting and guiding a sliding door between closed and open positions substantially closing and opening a door opening framed by a door jamb and with the trolley rail system comprising, in combination,

(a) a primary rail having at least two substantially linear portions that straddle a deviation portion mounted to the door jamb above the door opening;

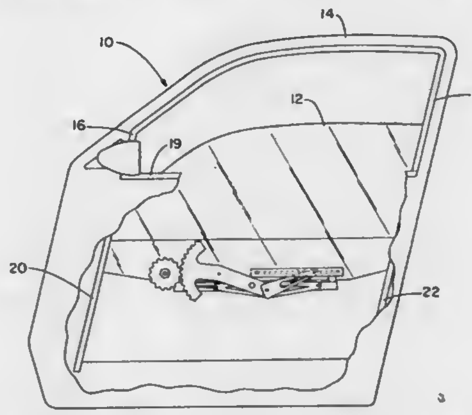
(b) an auxiliary rail mounted to the door jamb above the door opening generally parallel with said primary rail adjacent said deviation portion; and

(c) two trolleys mounted to the door with each trolley having a primary wheel and with one of said trolleys having an auxiliary wheel axially spaced from said one trolley primary wheel a distance for movement on said auxiliary rail as said one trolley primary wheel traverses said primary rail deviation portion to elevate and prevent said one trolley primary wheel from rolling along said primary rail deviation portion.

5,461,830
GLASS RUN GUIDE FOR SLIDABLE VEHICLE WINDOW

Ronald E. Dupuy, Wabash, Ind., assignor to GenCorp Inc., Fairlawn, Ohio
Continuation-in-part of Ser. No. 67,197, May 25, 1993, Pat. No. 5,345,718. This application Sep. 2, 1994, Ser. No. 300,673
The portion of the term of this patent subsequent to Sep. 13, 2011, has been disclaimed.
Int. Cl.⁶ E05D *15/16*

U.S. Cl. 49—449 **19 Claims**



1. A one-piece glass run guide for a slidable vehicle window, comprising an elongate polymeric strip having a substantially U-shaped transverse cross section including a base, an inboard leg and an outboard leg, each of the legs having a projecting lip portion which engages interior and exterior surfaces, respectively, of a slidable vehicle window , said glass run guide being substantially vertically disposed below a beltline within a vehicle door cavity such that said interior and exterior surfaces said slidable vehicle window are substantially continuously engaged by said lip portions below said beltline.

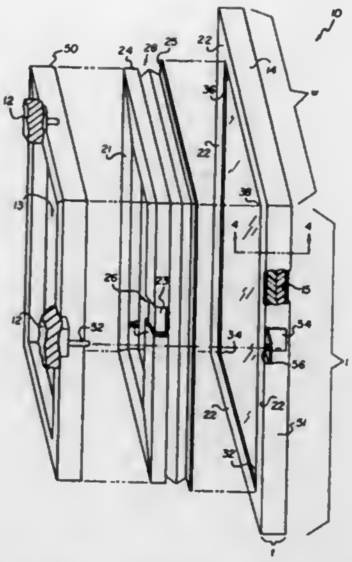
5,461,831
ASSEMBLAGE AND METHOD FOR RELIEVING OVERPRESSURE IN AN ENCLOSURE

Vratislav M. Michal, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Dec. 29, 1993, Ser. No. 175,039
Int. Cl.⁶ E04B *1/98*

U.S. Cl. 52—1 **10 Claims**

1. An assemblage for relieving overpressure in an enclosure having an opening, said assemblage comprising:

a first panel configured to surround an exterior side of said opening, said first panel comprising a thermal barrier layer bonded therein for providing thermal insulation during normal operation, and panel edges surrounding said thermal barrier



layer, said first panel comprising means for at least partially reducing movement of said first panel during thermal expansion, said means including at least one groove extending from an edge portion inside said first panel and terminating partially along the width of the thermal barrier layer, said groove being positioned rearwardly of said enclosure when mounted thereon; and,

a gasket member having a base flange for bonding to said thermal barrier layer, said gasket member comprising a bellows shaped portion for accommodating movements of said first panel during thermal expansion and a magnetic portion for providing a releasable seal between said bellows portion and said enclosure.

5,461,832

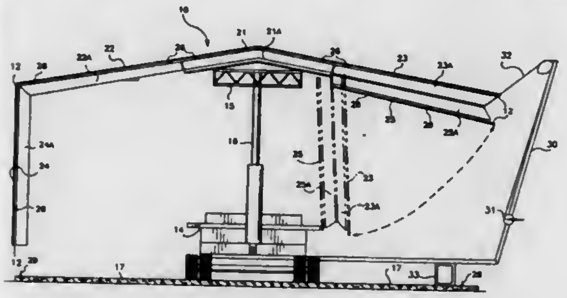
TRANSPORTABLE FOLDABLE BUILDING AND METHOD OF ERECTING A TRANSPORTABLE FOLDABLE BUILDING

Gene A. Smith, 146 Wall Street On The Water, Shallotte, N.C. 28459

Filed May 9, 1994, Ser. No. 239,703

Int. Cl.^{6} E04B ***1/344***

U.S. Cl. 52—69 **23 Claims**



19. A transportable, foldable building to be mounted on a supporting foundation, said building comprising:

(a) a central roof section comprising a central roof beam for being supported in vertically spaced relation above the foundation;

(b) first and second outer roof sections comprising first and second outer roof beams pivotally attached to respective ends of the central roof beam, said first and second outer roof beams extending downwardly from said central roof beam during transport of said building and prior to erecting said building onto the supporting foundation to reduce the width of the building during transport;

(c) third and fourth outer roof sections comprising third and fourth outer roof beams pivotally attached to respective ends of the first and second outer roof beams, and folded upwardly and inwardly in overlying relation to the first and second outer roof beams during transport of said building and prior to erecting and mounting said building onto the supporting foundation; and

(d) first and second side walls comprising first and second side beams pivotally attached to respective ends of the third and fourth outer roof beams, and folded downwardly and outwardly in overlying relation to the third and fourth outer roof beams during transport of said building and prior to erecting and mounting said building onto the supporting foundation, whereby said building is supportable entirely by said first and second side walls.

5,461,833

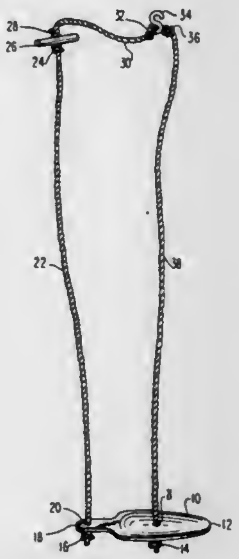
EASY-UP SAND ANCHOR

John J. Murray, 22 Elm St., Chester, N.J. 07930, and James P. Murray, 81 Hamilton Ave., Atlantic Beach, N.Y. 11509

Filed Aug. 1, 1994, Ser. No. 284,087

Int. Cl.^{6} E02D ***5/74***

U.S. Cl. 52—155 **15 Claims**



1. A sand anchor, comprising:

(a) an anchor base, wherein the shape of said anchor base is such that said anchor base serves as a hand-held shovel for digging the hole into which it will be placed,

(b) an anchor line,

(c) a means for joining one end of said anchor line to said anchor base, approximately at the center of said anchor base,

(d) a hook,

(e) a means for joining said hook to the other end of said anchor line,

(f) an easy-up line,

(g) a means for joining one end of said easy-up line to said anchor base, approximately at an edge of said anchor base,

(h) a handle,

(i) a means for joining said handle to the other end of said easy-up line, and

(j) a connecting line from said handle to said hook,

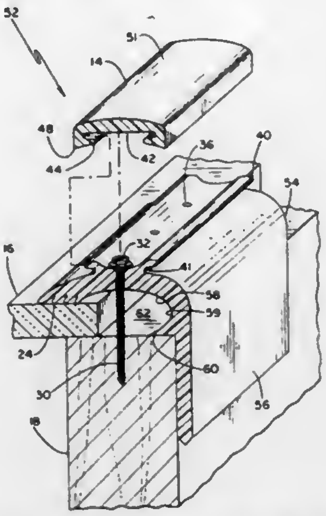
whereby said sand anchor is used by burying said anchor base horizontally in the sand and attaching said hook to an object to be secured, and said anchor base is removed from the sand by disconnecting said hook from said object to be secured and pulling up on said handle, thus shifting said anchor base from a horizontal to an approximately vertical position to permit said anchor base to be easily pulled to the surface, and whereby the purpose of said connecting line is to provide for convenient and safe positioning of said easy-up line during use of said sand anchor.

5,461,834
SOLARIUM PANEL CAP

Stanley B. Carlberg, 676 Ashland Ave. West, St. Paul, Minn. 55102

Filed Dec. 7, 1993, Ser. No. 163,581
Int. Cl.⁶ E04C *3/00*

U.S. Cl. 52—466 **8 Claims**

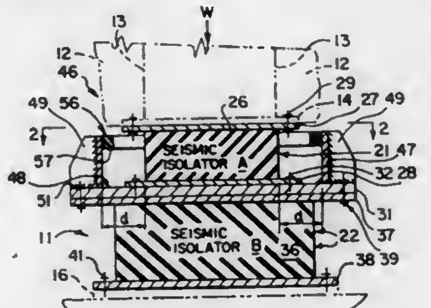


1. A solarium panel cap for sealing an interface defined between a pair of adjacent solarium panels, said interface being disposed atop a support joist, the cap comprising in combination:
(a) an elongated seal member having a length and a convex top surface and a concave bottom surface wherein said top and bottom surfaces terminate in a pair of ends having a plurality of flexible seal fingers integrally formed with said seal member along the length thereof, wherein said plurality of flexible seal fingers engage said respective solarium panel when said seal member is disposed thereupon, said seal member further having an attachment portion formed on said seal member top surface; and
(b) an elongated cover member having a dove tail recess for receiving said attachment portion of the seal member, said cover member having a concave bottom surface which corresponds with and engages said convex top surface of the seal member when disposed thereupon.

5,461,835
COMPOSITE SEISMIC ISOLATOR AND METHOD

Alexander G. Tarics, 29 Windward Rd., Belvedere, Calif. 94920
Continuation-in-part of Ser. No. 75,667, Jun. 11, 1993, abandoned. This application Sep. 24, 1993, Ser. No. 126,310
Int. Cl.⁶ F04H *9/02*

U.S. Cl. 52—167.8 **15 Claims**



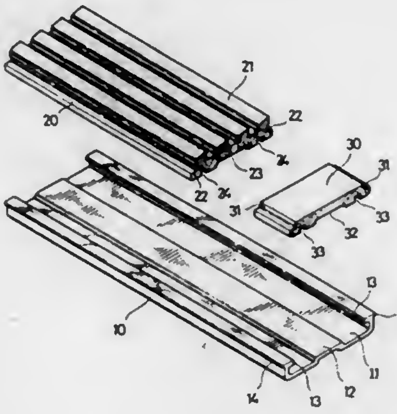
1. A composite seismic isolator for a building structure having a column or wall to be supported on a foundation comprising first and second seismic isolators having vertical axes, each having upper and lower portions and means disposed between the upper portion and the lower portion of said first and second seismic isolators permitting lateral displacement of the upper portion relative to the lower portion, said first seismic isolator being constructed so that it is relatively soft in a horizontal direction transverse to the vertical axis in comparison to the second seismic isolator, said first seismic isolator having an outer margin, restraining means carried by the second seismic isolator engageable by the outer margin of the first isolator permitting free transverse movement of one of the upper portion or the lower portion of the first seismic isolator within predetermined limits with respect to the second seismic isolator but restraining transverse movement of said one of the upper portion or lower portion of the first seismic isolator beyond said predetermined 'imits with respect to the second seismic isolator, said one of said upper portion or said lower portion of the second seismic isolator being free to move with respect to the other of said lower portion or the upper portion of the second seismic isolator to permit large lateral displacements and means adapted to mount the composite seismic isolator between the foundation and the wall or column to be supported by the foundation.

5,461,836
STRUCTURE OF SKID-PROOF PLATE FOR STAIRS

Shan T. Yang, No. 87-1, Jeng-Yih S. Rd., San Chung City, Taipei Hsien, Taiwan, Prov. of China

Filed Apr. 22, 1994, Ser. No. 231,579
Int. Cl.⁶ E04F *11/09*

U.S. Cl. 52—179 **3 Claims**



1. A skid-proof plate structure for stairs, comprising:
a base plate made of metal, said base plate being extruded to form an elongated strip, said base plate including two concave embedding seats, a central convex portion, and a strip with an inwardly protruding flange and an outwardly protruding flange on each side of said base plate;
a skid-proof embedding strip made of abrasion resistant plastic material, said embedding strip including a plurality of protruding ribs, a top surface of each of said ribs being angled toward a front side of said embedding strip, said front side of said embedding strip and a rear side of said embedding strip each includes a groove, and a bottom side of said embedding strip includes a central groove and two flexing grooves, said flexing grooves being located near the front and rear sides of the embedding strip, said flexing grooves being received in said concave embedding seats, and said inwardly protruding flanges of said base plate being received in said grooves in said front side and said rear side of said embedding strip, and said central convex portion being received in said central groove on said bottom of said embedding strip;
end embedding strips made of abrasion resistant plastic material, said front side of each of said embedding strips and said rear side of each of said embedding strips each includes a groove, said grooves receiving said inwardly protruding flanges of

said base plate, a bottom surface of said end embedding strips has a conformation equivalent to that of said embedding strip so that said end embedding strips are received in said base plate.

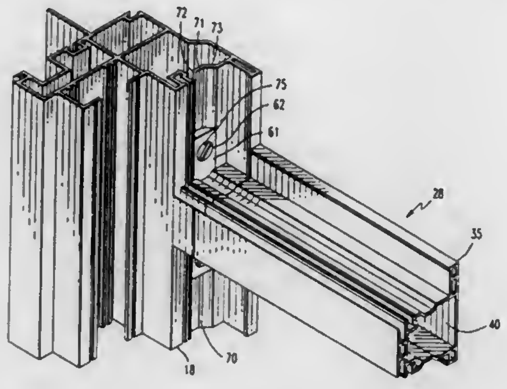
5,461,837
WINDOW MEETING RAIL

Michael T. Chaney, Middletown, and Philip G. Morton, Germantown, both of Ohio, assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Dec. 29, 1993, Ser. No. 174,847

Int. Cl.^{6} E06B *1/04*

U.S. Cl. 52—204.68 **22 Claims**



1. A meeting rail for use in a window having a frame comprising a pair of jambs and a head, a sill and a meeting rail each joined to said jambs, said meeting rail comprising:
- (a) an elongated body defining a longitudinally extending opening; and
- (b) a clip for joining said meeting rail to said frame, said clip comprising:
  - (i) a principal portion sized for insertion into said opening; and
  - (ii) attachment means for attaching said clip to a jamb in a window frame; and
- (c) a cross rail sized for insertion into said opening and defining an aperture having an interior wall, said principal portion of the clip being sized for insertion into said aperture.

5,461,838
FIRE BARRIER

Paul S. Heller, 14041 Mar Vista St., Whittier, Calif. 90602

Filed Aug. 25, 1994, Ser. No. 296,423

Int. Cl.^{6} E04B *1/62*

U.S. Cl. 52—396.01 **16 Claims**

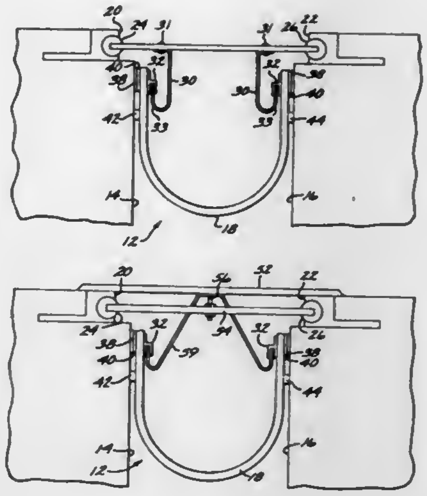
1. A fire barrier system for sealing a dynamic void, comprising:

diagonally oriented support bars spanning the width of said void, each bar's ends being slideably affixed to opposite walls defining said void;

flexible fire barrier material extending across and having opposite edges extending along said void, said material being of a width substantially wider than the nominal width of said void;

means suspending from said diagonal support bars the edges of said barrier material oriented along the length of said void; and

means biasing said opposite edges of said material into sealing engagement with said opposite walls.



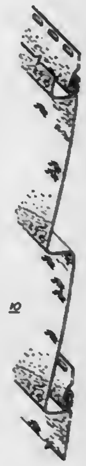
5,461,839
REINFORCED EXTERIOR SIDING

David H. Beck, Jackson, Mich., assignor to CertainTeed Corporation, Valley Forge, Pa.

Filed Dec. 22, 1993, Ser. No. 171,726

Int. Cl.^{6} E04D *1/00*

U.S. Cl. 52—519 **20 Claims**



1. An exterior finishing panel, comprising an elongated thermoplastic sheet including an outwardly-facing surface having an aesthetic appearance and an inwardly-facing surface;

a relatively rigid rod disposed along a portion of a length of said thermoplastic sheet, said rod having a flexural modulus substantially greater than a flexural modulus of said thermoplastic sheet;

said elongated thermoplastic sheet comprising a plurality of rectangular sheathing sections having lateral marginal flanges;

wherein said rod comprises an extruded reinforced thermoplastic.

5,461,840

CARDBOARD SPACER/SEAL AS THERMAL INSULATOR

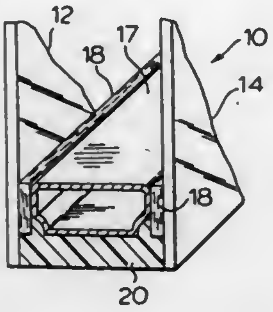
Donald M. Taylor, 3844 Sundown Drive, Nanaimo, British Columbia, Canada

Continuation-in-part of Ser. No. 135,709, Oct. 13, 1993, Pat. No. 5,394,671. This application Feb. 17, 1994, Ser. No. 197,915

The portion of the term of this patent subsequent to Mar. 1, 2011, has been disclaimed.

Int. Cl.^{6} E04C *2/54*

U.S. Cl. 52—786.13 **22 Claims**



1. A cardboard insulating ribbon of restricted width, having a plastic sealing component to preclude percolation of fluids therethrough, for use in combination with spacer seals in multi-paned glazing units, to provide an insulative thermal break between the inner faces of adjacent panes of a said unit.

5,461,841

DEVICE FOR FEEDING WRAPPER SHEETS, ESPECIALLY FOR USE IN CIGARETTE PACKING MACHINES

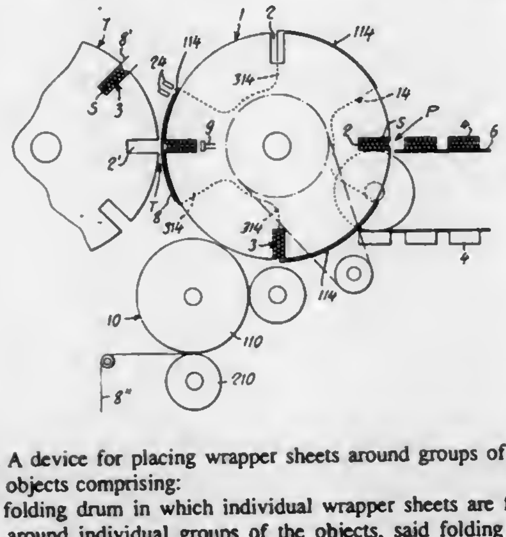
Valter Spada, Marzabotto, and Giuseppe Tosi, Modena, both of, Italy, assignors to Sasib S.p.A., Bologna, Italy

Filed Mar. 8, 1994, Ser. No. 207,052

Claims priority, application Italy, Mar. 10, 1993, GE93A0017

Int. Cl.^{6} B65B *11/32*

U.S. Cl. 53—234 **16 Claims**



1. A device for placing wrapper sheets around groups of elongate objects comprising:

- a folding drum in which individual wrapper sheets are folded around individual groups of the objects, said folding drum including a periphery and a plurality of folding cells in the periphery;
- a transfer drum which transfers individual groups of the objects from a feed line of the groups to said folding drum, said transfer drum including sides, a rotational axis, and a plurality of transfer cells, each respective said transfer cell receiving a respective group from the feed line and being moved to a transfer point where a respective one of said folding cells is provided in a coinciding position of alignment to receive the group in the respective said folding cell;
- a displacement means for moving, when said transfer cell is aligned with said folding cell, the group in said transfer cell to said folding cell;
- a pick-up/positioning drum which picks up a wrapper sheet and positions the wrapper sheet at the transfer point between the aligned said transfer cell and said folding cell before operation of said displacement means so that as the group is moved by said displacement means from the aligned said transfer cell the wrapper sheet is pushed by the group into the aligned said folding cell and folded about the group in a U shape,

said pick-up/positioning drum

- including two discs arranged against the sides of said transfer drum, said discs being coaxial with one another and with the rotational axis of said transfer drum, said discs being coupled together for rotation with one another and for independent rotation relative to said transfer drum,
- including peripheral sheet-placing sectors for each said disc by which the wrapper sheets are picked up and positioned; and a driving means for driving said pick-up/positioning drum at a different speed than said transfer drum such that one wrapper sheet is brought simultaneously with each said transfer cell to the transfer point.

5,461,842

PACKING LINE FOR PRODUCING TWIN PACKETS

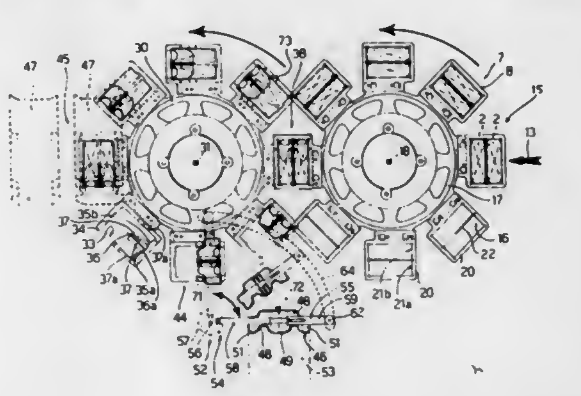
Marco Brizzi, Predosa, and Antonio Gamberini, Bologna, both of, Italy, assignors to G.D Societa' per Azioni, Bologna, Italy

Filed Feb. 2, 1995, Ser. No. 382,672

Claims priority, application Italy, Feb. 11, 1994, BO94A0054 U

Int. Cl.^{6} B65B *11/28*

U.S. Cl. 53—234 **17 Claims**

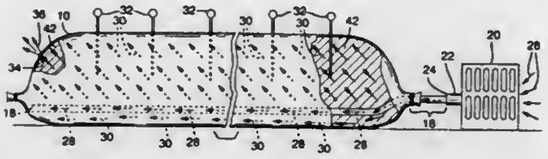


1. A packing line for producing twin packets, each comprising two half packets (2) and a single collar (46) in turn comprising a central accordion portion (49) interposed between the two half packets (2), and two main panels (48) arranged contacting respective large lateral surfaces of the two half packets (2); the line (6) comprising folding means (54) cooperating successively with said collars (46) for so folding them, from a flat configuration, as to form said central accordion portion (49); characterized in that said folding means (54) comprise a first and second gripping member (65) comprising vacuum means for gripping the main panels (48) of a respective collar (46); and actuating means (62, 63) for moving the two gripping members (65) in relation to each other and in a given direction between a parted position corresponding to a distended configuration of said central portion (49), and an adjacent position corresponding to an accordion configuration of said central portion (49).

5,461,843

METHOD FOR TREATMENT OF BAGGED ORGANIC MATERIALS

Ronald V. Garvin, Hammond; Larry R. Inman, Warrenton, both of Oreg., and Arthur P. Schuette, Wilmington, N.C., assignors to Ag-Bag International, Warrenton, Oreg.
Division of Ser. No. 135,046, Oct. 12, 1993. This application Aug. 24, 1994, Ser. No. 296,314
Int. Cl.^{6} B65B *31/06*
U.S. Cl. 53—434 **3 Claims**

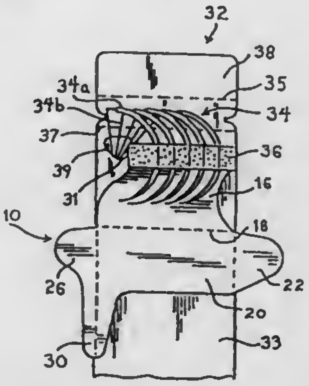


1. A method of treating organic materials comprising:
enclosing organic materials in large plastic storage bags that are impervious to moisture and air;
providing at least one conduit in the organic material as enclosed which has one end extended out of the bag and exposed to the exterior of the bag, and providing multiple openings through the walls of the conduit along the length of the conduit inside the bag and exposed to the organic material therein;
providing a vent opening in the bag at a position spaced from the conduit and spaced from the one end of the conduit extended out of the bag, and
forcing a media suitable for treating the organic material in the bag into the exposed end of the conduit, through the openings in the conduit and into the material in the bag for treating said material said vent opening positioned for circulation of said media through said organic material and out of the vent opening.

5,461,844

METHOD OF USING A NEEDLE SHIELD DEVICE FOR SURGICAL PACKAGES

David L. Brown, Wallingford, Conn., assignor to United States Surgical Corporation, Norwalk, Conn.
Division of Ser. No. 55,959, Apr. 30, 1993, Pat. No. 5,358,102, which is a continuation of Ser. No. 852,686, Mar. 17, 1992, abandoned, which is a continuation-in-part of Ser. No. 636,227, Dec. 31, 1990, Pat. No. 5,236,082. This application Jul. 22, 1994, Ser. No. 279,129
The portion of the term of this patent subsequent to Aug. 17, 2010, has been disclaimed.
Int. Cl.^{6} B65B *11/58*
U.S. Cl. 53—449 **4 Claims**

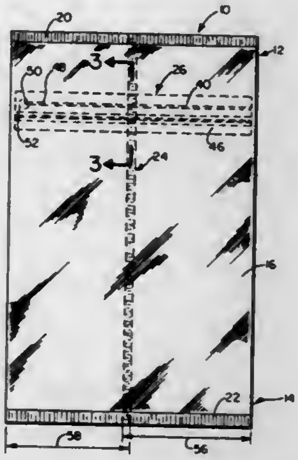


1. A method of loading a suture retainer comprising the steps of:
positioning at least one suture between a first panel and a second panel of a suture retainer, said suture having a needle secured to at least one end thereof, such that said needle is positioned outside said first and second panels,
mounting a needle shield member to one of said first and second panels,
positioning said needle on said needle shield member, and
folding said needle shield member about said needle to enclose said needle therein.

5,461,845

ZIPPERED FILM AND BAG

James W. Yeager, 1209 Robb St., Rte. 1, Box 7, Summit, Miss. 39666
Continuation of Ser. No. 966,427, Oct. 26, 1992, abandoned. This application Jul. 12, 1994, Ser. No. 275,281
Int. Cl.^{6} B65D *33/24; 33/28;* **B65B** *9/06*
U.S. Cl. 53—451 **5 Claims**



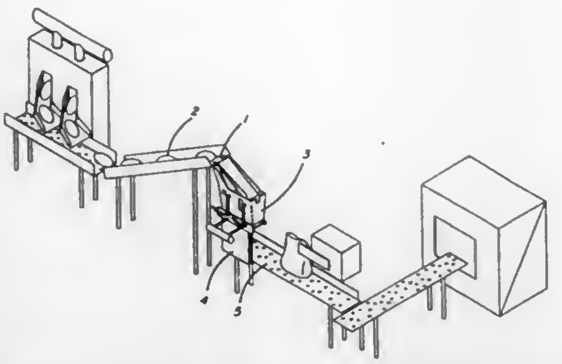
1. A method for making reclosable bags comprising:
a. connecting a plurality of reclosable fasteners each with two interlocking profile strips to a rectangular sheet of film having two parallel side edges and a top and a bottom edge, said reclosable fasteners being less than half the width of said rectangular sheet of film and spaced a single bag length apart, said reclosable fasteners being perpendicular to said two side edges, each profile strip of each reclosable fastener being maintained in interlocked position and being independently connected to the same side of said film, said film being maintained in a flat unfolded state,
b. winding said sheet of film in said flat unfolded state into a roll on a cylindrical core material, said reclosable fasteners being perpendicular to the direction said film is wound upon said core,
c. unwinding said roll of film and overlapping said side edges of said film to form a tube to enclose said reclosable fasteners on the inside of said tube, said tube having a top edge and a bottom edge,
d. sealing said overlapped side edges of said film,
e. sealing said bottom edge of said tube, and
f. sealing said tube said single bag length from said bottom edge to form a top edge of said bag to enclose a single reclosable fastener.

5,461,846

HIGH SPEED BAG PACKAGING MACHINE

Roger Cormier, Buckingham; Robert Cormier, and Jocelyn Riopel, both of Gatineau, all of, Canada, assignors to Atelier D'usinage Cormier & Freres Inc., Gatineau, Canada
Filed Jun. 25, 1993, Ser. No. 81,694
Int. Cl.^{6} B65B *43/14;* **C06F** *5/00*
U.S. Cl. 53—571 **1 Claim**

1. In an automatic bag filling machine for filling a plurality of plastic bags formed of two sheets bonded along their lower and



side edges and provided with an upper end opening formed along an upper edge of the first of said two sheets, the second of such two sheets having an upwardly protruding, extension panel, for support of said bags in a vertically orientation, a bag-feeder mechanism comprising:

(a) support rods which carry a plurality of said bags in a flattened state by passing through holes formed in said extension panel to present such bags consecutively for filling by the machine; and

(b) a gravity activated pusher mounted by a hinge positioned above the upper end of the first of said bags to be filled, such pusher comprising:
   (i) suspension rods extending downwardly from the hinge to terminate at a contact plate which lies against the last of said bags to be filled; and
   (ii) a cantilevered mass supported at a distance displaced outwardly from the last of said bags and connected to said contact pipe,

whereby the weight of such cantilevered mass applies a varying advancing force through the contact plates to the extension panels of said plurality of bags to advance said panels along the support rods, and wherein said contact plate is provided with holes passing therethrough, the support rods passing freely through such holes as the contact plate is swung about its hinges.

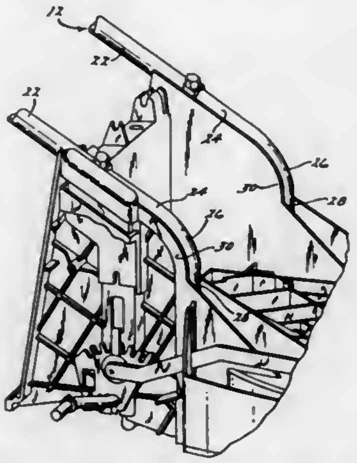
5,461,847
LAWN MOWER HAVING IMPROVED HANDLE-TO-DECK COUPLING ARRANGEMENT

David S. Strong, Battersea; Richard P. Rosa, Brockville, and Brian S. Burnett, Mallorytown, all of, Canada, assignors to Black & Decker Inc., Newark, Del.

Filed Aug. 12, 1994, Ser. No. 289,453

Int. Cl.^{6} A01D *34/82*

U.S. Cl. 56—16.7 **13 Claims**



1. A vegetation cutter having a handle member having a curved portion and a deck into which a portion of said handle member is secured, the improvement comprising:

a channel having at least one generally linear portion and a curved portion integrally formed in said deck;

a socket member formed integrally with the deck and communicating with said channel so as to receive a distal end of said handle member therein when said handle member is positioned within said channel; and

an anchor-type fastening assembly associated with said socket and including a locking member which may be urged from a first position into a second position, the anchor-type fastening system operating to lockably engage a portion of an inner wall of said handle member when said locking member is urged from said first position into said second position, thereby retaining said distal end of said handle member to said deck.

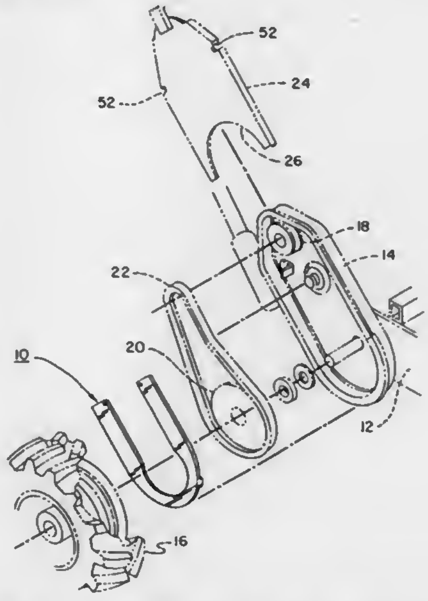
5,461,848
MOWER PULLEY GUARD

Leonard Anthony, P.O. Box 411, Springfield, La. 70462

Filed Nov. 25, 1994, Ser. No. 344,948

Int. Cl.^{6} A01D *34/04;34/30;75/00*

U.S. Cl. 56—320.1 **9 Claims**



1. A mower pulley guard for use with a sickle-bar mower including a pulley housing interposed between a wheel and a deck of the mower, with a mower pulley rotatably mounted within the pulley housing, a wheel rotatably mounted relative to the deck, a wheel pulley mounted in mechanical communication with the wheel, a belt extending over both the mower pulley and the wheel pulley, and a cover plate mounted to the pulley housing and including a semi-circular cut out which accommodates for the mechanical coupling between the wheel pulley and the wheel, the mower pulley guard comprising:

a semi-circular panel positionable over the cover plate to augment the cover plate so as to enclose the wheel pulley to preclude an entrance of debris into the pulley housing; and,

a mounting means for securing the semi-circular panel to the pulley housing.

5,461,849
VERSI-RAKE ATTACHMENT

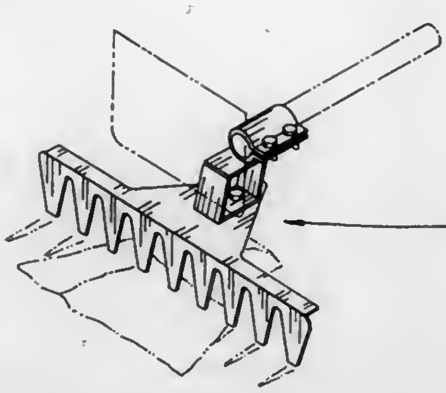
Roy L. Allen, 9811 N. 17th Dr., Phoenix, Ariz. 85021

Filed Jun. 10, 1994, Ser. No. 258,544

Int. Cl.^{6} A01D *11/06*

U.S. Cl. 56—400.06 **2 Claims**

1. A new and improved versi-rake attachment for performing a combination of garden or lawn tasks simultaneously comprising, in combination:



a clamp having a first rounded portion, a second attachment portion, an inner surface, and an outer surface, the first rounded portion adapted to be secured to a handle of a tool, the second attachment portion having an upper section and a lower section, two apertures formed on both the upper section and the lower section of the clamp, the two apertures on both the upper section and the lower section in alignment with each other, two thumb screws adapted to be received through the apertures formed on both the upper section and the lower section of the clamp, the two thumb screws functioning to secure or release the clamp from the handle of the tool;

a plurality of small spikes integral with the inner surface of the first rounded portion of the clamp, the small spikes functioning to grasp the handle of the tool and prevent the clamp from rotating;

a bracket having a generally rectangular configuration, the bracket having a lower portion, an upper portion, and two side portions, the lower portion secured to the outer surface of the clamp, two apertures formed on the upper portion of the bracket;

a tool head having a flat portion and a cultivating rake portion, the flat portion having two apertures formed therethrough, the two apertures corresponding with the two apertures formed on the upper portion of the bracket, the cultivating rake portion having a plurality of vertically extending tines therefrom; and

two inner thumb screws adapted to be received through the two apertures formed in the upper portion of the bracket and the two apertures formed in the flat portion of the tool head, the two inner thumb screws functioning to removably secure the tool head to the bracket.

5,461,850

MULTI-STRAND STEEL CORD HAVING A CORE AND PERIPHERAL STRANDS SURROUNDING THE CORE

Pol Bruyneel, Wielsbeke, and Luc Bourgois, Desselgem, both of, Belgium, assignors to N.V. Bekaert S.A., Zwevegen, Belgium

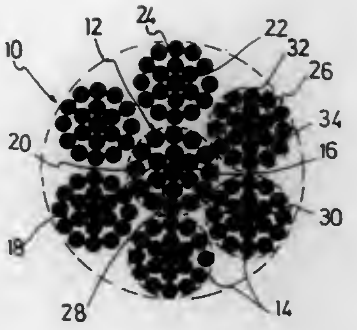
Filed Dec. 2, 1993, Ser. No. 160,293

Claims priority, application European Pat. Off., Dec. 18, 1992, 92204017

Int. Cl.^{6} D02G *3/36;* **B60C** *9/00*

U.S. Cl. 57—212 **29 Claims**

1. A steel cord having a diameter D and comprising a core strand and up to six peripheral strands surrounding the core strand, the core strand having a diameter D1 and the peripheral strands having a diameter D2, a ratio of the core strand diameter to the peripheral strand diameter D1/D2 being greater than 1.05, each strand comprising a center of one or more center filaments and two or more layers of filaments surrounding the center, all the filaments of each layer having substantially the same diameter, a radially outer layer having a twist angle which is smaller than a twist angle of a radially inner layer of the same strand, the twist angle of each layer being determined by the diameters and a lay length of the filaments, a first free space ranging from 0.0015×D to 0.0075×D being provided in at least the core strand between each pair of filaments of the radially most inner layer.



5,461,851

ROLLER CHAIN

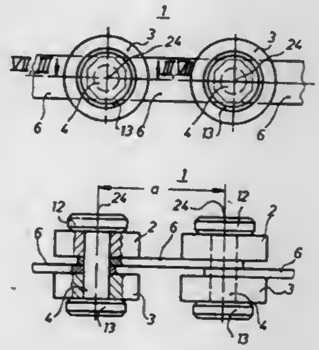
Erwin P. J. Lehrieder, Gaukönigshofen, and Frans K. Mezger, Lauda/Königshofen, both of, Germany, assignors to Koenig & Bauer Aktiengesellschaft, Wurzburg, Germany

Filed Jul. 8, 1994, Ser. No. 272,019

Claims priority, application Germany, Jul. 9, 1993, 43 22 929.8

Int. Cl.^{6} F16G *13/06*

U.S. Cl. 59—4 **8 Claims**



1. A roller chain useable to draw a web of material along guide tracks in a web-fed rotary printing pres, said roller chain comprising:

a plurality of longitudinally spaced pairs of rollers each of said pairs of rollers having first and second rollers, said first and second rollers in each of said pair of rollers being laterally spaced from each other;

a roller pin extending between said first and second laterally spaced rollers in each of said pairs of rollers, said first and second rollers in each said pair of rollers being seated on first and second ends of said roller pin, each said roller pin having a central transversely extending axis of rotation about which said first and second rollers in each of said roller pairs rotates; and

a single, central longitudinally extending flexible leaf-spring plate extending longitudinally between each of said two longitudinally adjacent pairs of rollers in said roller chain, each of said flexible leaf-spring plates having roller pin receiving bores adjacent first and second ends through which said roller pins of said longitudinally adjacent pairs of rollers extend, a first end of a first spring plate being situated on one of said roller pins laterally adjacent a second end of a second spring plate, said spring plates being positioned intermediate said first and second rollers in each of said roller pairs to form said roller chain.

5,461,852

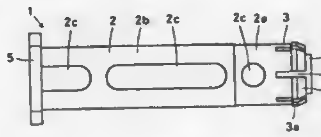
CHAIN AND CONNECTING PIN THEREOF

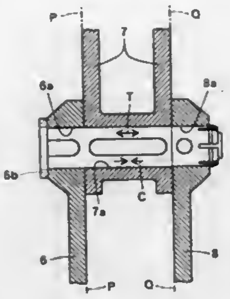
Hiromitsu Nagamatsu, Saitama, Japan, assignor to Hitachi Metals, Ltd., Tokyo, Japan

Filed May 3, 1994, Ser. No. 238,025

Int. Cl.⁶ F16G *13/06*

U.S. Cl. 59—84 **3 Claims**





1. A chain pin for pivotally connecting chain links having bores, adjoining links of the chain links including an inlet outer link, an inner link and an outlet outer link, said chain pin comprising:

- a body for insertion through said bores of the chain links, said body being formed from fiber reinforced thermoplastic resin and having a peripheral surface, said body having two diametrically opposite rows of grooves formed in said peripheral surface, and having a front end from which an annular shell projects coaxially therewith and an axial protrusion which extends through said shell coaxially therewith,
- wherein said shell includes a mid-portion having a radially outwardly projecting shoulder formed therearound, a frustoconical front end portion having a front end and an outer peripheral surface tapered toward said front end, and at least one radially extending slit which makes said shell radially compressible,
- wherein said protrusion includes a front end surface which is one of flush with and projects from said front end of said shell;
- said chain pin further comprising means for holding said chain pin against rotation to maintain said rows of grooves at right angles with respect to a longitudinal direction of the chain links;
- wherein the inlet outer link and the inner link define a first border, shearing plane therebetween, and the inner link and the outlet outer link define a second border, shearing plane therebetween, said first and second border, shearing planes defining a distance therebetween, wherein said pin is formed solid at said first and second border, shearing planes when said pin is fully inserted, and wherein two of said diametrically opposite grooves of said pin extend continuously for substantially the entire distance between said first and second border, shearing planes when said pin is fully inserted.

5,461,853

HRSG BOILER DESIGN WITH AIR STAGING AND GAS REBURN

Richard C. Vetterick, Akron, Ohio, assignor to The Babcock & Wilcox Company, New Orleans, La.

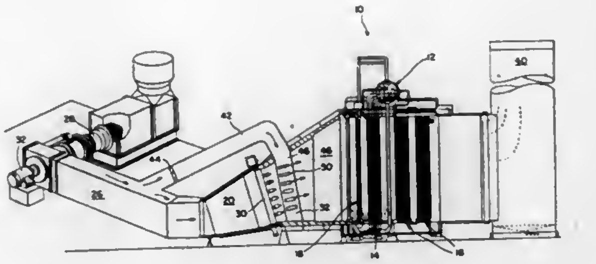
Filed Nov. 30, 1994, Ser. No. 346,713

Int. Cl.⁶ F02C *6/18*

U.S. Cl. 60—39.02 **9 Claims**

1. A heat recovery steam generator apparatus which produces reduced NO_x emissions, comprising:

- a heat recovery steam generator having an inlet plenum;



- a gas turbine having an exhaust duct for discharging oxygen-rich exhaust gas from the gas turbine;
- a duct burner spanning the inlet plenum of the heat recovery steam generator, the exhaust duct of the gas turbine being connected directly to the inlet plenum upstream of the duct burner for supplying a first portion of the exhaust gas thereto;
- means for supplying fuel to the duct burner to produce a fuel-rich mixture at an outlet thereof; and
- a gas staging bypass duct branched from the exhaust duct of the gas turbine and connected directly to one or more internal duct assemblies located within a chamber downstream of the inlet plenum and the duct burner of the heat recovery steam generator, the one or more internal duct assemblies having apertures for admitting a bypassed second portion of the oxygen-rich turbine exhaust gas around the duct burner to a point downstream thereof and provide the second portion of the oxygen-rich turbine exhaust gas to the chamber together with the first portion of the turbine exhaust gas flowing through the duct burner for the completion of combustion of the fuel and for the reduction of NO_x and CO.

5,461,854

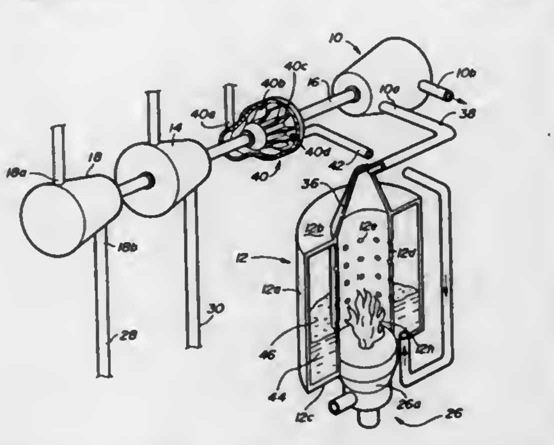
COMBUSTOR COOLING FOR GAS TURBINE ENGINES

Arthur T. Griffin, Jr., 1320 Cadillac Blvd., #103, Detroit, Mich. 48214

Filed Jul. 7, 1993, Ser. No. 87,974

Int. Cl.⁶ F02G *3/00*

U.S. Cl. 60—39.05 **15 Claims**



1. A method of cooling a combustor and combustion gases of a gas turbine engine assembly of the type including a turbine, said combustor defining a combustion chamber and including a burner disposed adjacent to one end of said combustion chamber, said burner arranged to receive a fuel/air mixture and generate products of combustion within said burner for delivery to said turbine through said combustion chamber, the method comprising:

- delivering a substance to said one end of said combustion chamber in a low energy liquid phase;
- placing said substance in heat exchange relation to said combustion chamber by forming an annular bath around said combustion chamber to absorb thermal energy from said combustion products within said combustion chamber and thereby converting said substance to a higher energy level; and

injecting said higher energy level substance into the opposite said combustion chamber proximate the opposite end of said combustion chamber for mixture with said combustion products and delivery in a gaseous phase with said combustion products to said turbine.

5,461,855

METHOD AND DEVICE FOR CONTROLLING COMBUSTORS FOR GASTURBINE

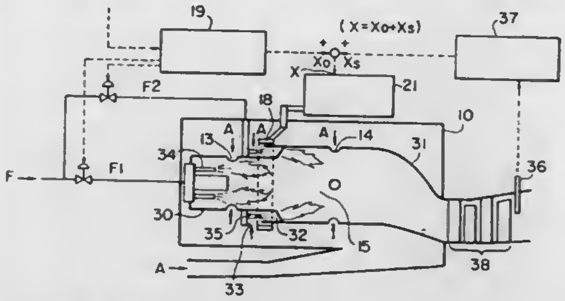
Hiroshi Inoue; Satoshi Tsukahara, both of Hitachi, and Kazumi Iwai, Mito, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 800,261, Nov. 29, 1991, abandoned. This application Feb. 3, 1994, Ser. No. 193,354

Claims priority, application Japan, Nov. 30, 1990, 2-329445

Int. Cl.^{6} F23C *1/00*

U.S. Cl. 60—39.06 15 Claims



1. A method for controlling a plurality of combustors supplying a pressurized gas to a gas turbine, each of said combustors includes a combustion chamber having a first diffusion combustion part and a second premixed combustion part, a first air supply means for supplying a combustion air into the first, diffusion combustion part of said combustion chamber, and a second air supply means for adjusting an amount of air supplied into the second, premixed combustion part of said combustion chamber of the combustor to change a combustion condition of the combustor, the method comprising the steps of:

measuring at least one of a temperature and a concentration of a component of the pressurized gas from a respective combustor of said plurality of combustors which corresponds to a combustion condition of the combustor,

measuring a difference between the measured value of the pressurized gas and a desired value thereof which corresponds to a desired combustion condition of the combustor, and

changing a rate of the amount of air supplied by the second air supply means of said respective combustor with respect to an amount of combustion air supplied by the first air supply means thereof in accordance with the measured difference to change a combustion condition of said respective combustor, and wherein said steps are performed for each of said plurality of combustors so that the combustion conditions of the combustors are changed to the desired combustion condition.

5,461,856

DIVERGENT SLAVE PETAL FOR SEALING IN VARIABLE GEOMETRY EXHAUST NOZZLES FOR GAS TURBINE PROPULSION UNITS

Jose I. I. Mendia, Gorliz, and Jose R. Urruela, Las Arenas, both of, Spain, assignors to Sener, Ingenieria Y Sistemas, S.A., Vizcaya, Spain

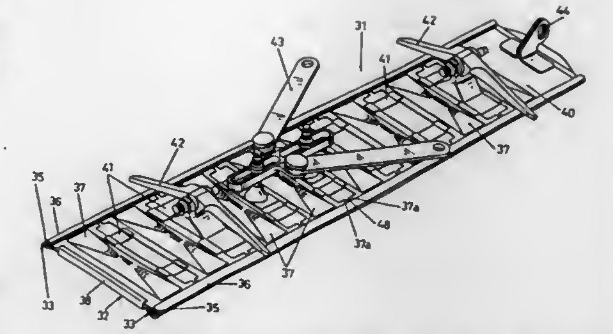
Filed Aug. 27, 1993, Ser. No. 113,228

Claims priority, application Spain, Jan. 27, 1992, 9202157

Int. Cl.^{6} F02K *1/12*

U.S. Cl. 60—230 20 Claims

1. Divergent slave petal for sealing in variable geometry exhaust nozzles for gas turbine propulsion units, the divergent slave petal comprising:



a base plate having longitudinal edges, the base plate being formed to absorb forces acting along a longitudinal axis of the divergent slave petal and to transmit substantially no torsional forces acting about the longitudinal axis of the divergent slave petal;

a plurality of discrete transverse elements which are transverse to the longitudinal axis of the divergent slave petal and have transverse edges which are parallel to the longitudinal axis of the divergent slave petal, the discrete transverse elements being formed to transmit transverse and shear forces but not torsion forces which act about the longitudinal axis of the divergent slave petal;

a plurality of guide elements for linking the base plate and the discrete transverse elements, the guide elements extending along the longitudinal edges of the base plate;

a plurality of intermediate discrete transverse element fasteners secured to the base plate between consecutive transverse elements, the guide elements and the intermediate discrete transverse element fasteners being arranged to allow relative freedom of movement between the base plate and the discrete transverse elements.

5,461,857

ENGINE EXHAUST GAS PURIFICATION DEVICE

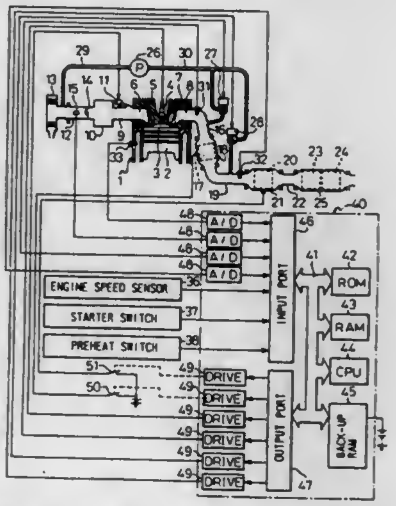
Takaaki Itou, Mishima; Hiroshi Tanaka, Susono; Keiso Takeda, Mishima; Hidemi Ohnaka, Susono; Kazuhisa Kunitake, Susono, and Toshio Tanahashi, Susono, all of, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jun. 10, 1994, Ser. No. 259,751

Claims priority, application Japan, Jun. 11, 1993, 5-140737

Int. Cl.^{6} F01N *3/22*

U.S. Cl. 60—276 21 Claims



1. An engine exhaust gas purification device, comprising:

air-fuel mixture control means for making an air-fuel mixture burned in a combustion chamber of the engine a rich air-fuel mixture;

a three way catalyst arranged in an exhaust passage of the engine;
a NOx absorbent arranged in said exhaust passage downstream of said three way catalyst, said NOx absorbent absorbing NOx therein when an air-fuel ratio of exhaust gas flowing into said NOx absorbent is lean;
secondary air supply means for feeding secondary air into said exhaust passage between said three way catalyst and said NOx absorbent; and
secondary air control means for controlling an amount of secondary air fed from said secondary air supply means to maintain the air-fuel ratio of the exhaust gas flowing into said NOx absorbent at a lean air-fuel ratio.

5,461,858

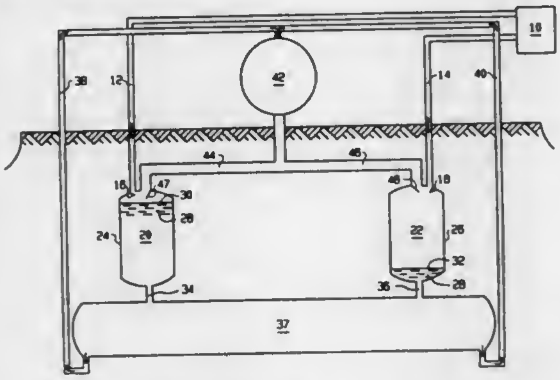
METHOD OF PRODUCING HYDROELECTRIC POWER

Arthur F. Johnson, Boulder, Colo., assignor to Energy Conversation Partnership, Ltd., Boulder, Colo.

Filed Apr. 4, 1994, Ser. No. 222,753

Int. Cl.⁶ F16D *31/02*

U.S. Cl. 60—325 **17 Claims**



1. A process for generating hydro-electric power which comprises:
producing steam in a power plant;
feeding the steam into a vertical cylindrical tank of water which is provided with a light weight float upon the water;
introducing the steam into the tank in a quantity sufficient to exert pressure on the float and cause the water to exit the tank; and
directing the exiting water to a hydro-electric apparatus for operation of same to generate power.

5,461,859

CENTERING SYSTEM WITH ONE WAY VALVE FOR FREE PISTON MACHINE

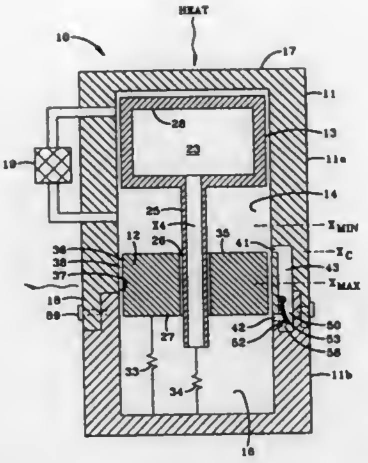
William T. Beale; Neill W. Lane, both of Athens, Ohio, and Jarlath McEntee, Castine, Me., assignors to Sunpower, Inc., Athens, Ohio

Filed Sep. 8, 1994, Ser. No. 303,037

Int. Cl.⁶ F01B *29/10*

U.S. Cl. 60—517 **11 Claims**

1. An improved piston centering apparatus for a free piston machine having a housing including a cylinder and a piston sealingly reciprocatable in the cylinder, the housing enclosing a work space bounded by a first end of the piston and also enclosing a second space bounded by the opposite end of the piston, both spaces containing a working gas, the pressure in the second space having an average pressure and the pressure in the work space varying periodically in opposite directions from said average pressure, said pressure variation being asymmetric and thereby causing a net leakage flow of working gas from one of the spaces to the other through the clearance between the piston and the cylinder, wherein the improvement comprises the combination of:



(a) a passageway in communication between the work space and the second space and having a piston position responsive valve linked to the piston for opening in response to the piston being near the center of the opposite limits of piston reciprocation; and
(b) a pressure responsive, one way valve connected to the passageway and oriented to permit the passage of working gas between the spaces in a direction opposite to said net leakage flow and to prevent substantial flow in the reverse direction.

5,461,860

EXHAUST GAS TURBOCHARGER AND METHOD OF OPERATION

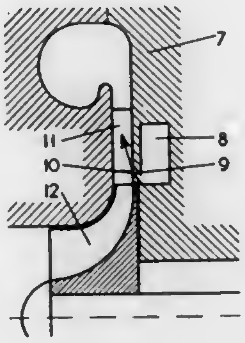
Claus-Detlef Schegk, Klingnau, Switzerland, assignor to ABB Management AG, Baden, Switzerland

Filed Oct. 7, 1994, Ser. No. 319,565

Claims priority, application Germany, Jan. 9, 1993, 43 34 466.6

Int. Cl.⁶ F02B *37/00*

U.S. Cl. 60—611 **6 Claims**



1. An exhaust gas turbocharger for an internal combustion engine, comprising:
a turbine and a centrifugal compressor, which are both arranged on a common shaft, said compressor for compressing air to be delivered to the internal combustion engine, said compressor including an impeller driven by the turbine and a vaned diffuser having an inlet positioned downstream from said impeller in a flow direction of the air compressed by said impeller; and
an auxiliary air drive comprising a plurality of injectors fed from an external compressed air source, said air injectors having delivery openings disposed in the region of said diffuser inlet and downstream of said impeller.

5,461,861

PROCESS FOR COMPRESSING A GASEOUS MEDIUM

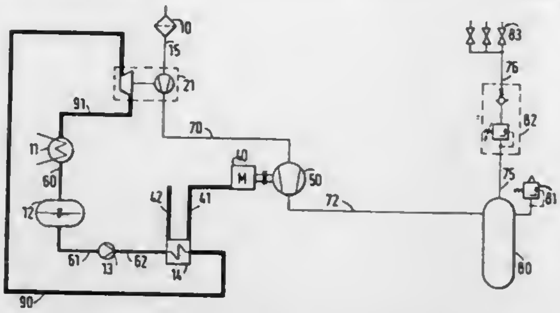
Harald Wenzel, Kefenrod, Germany, assignor to Mannesmann Aktiengesellschaft, Dusseldorf, Germany

Filed Oct. 7, 1993, Ser. No. 133,679

Claims priority, application Germany, Jan. 7, 1992, 42 34 393.3

Int. Cl.^{6} F01K *23/10;* **F04B** *17/05*

U.S. Cl. 60—618 **12 Claims**



1. A process for compressing a gaseous medium, comprising the steps of:

providing a compressor;

driving the compressor with a thermal engine arranged and adapted to drive the compressor, the thermal engine having an exhaust gas flow;

sucking gas of a lower initial pressure into the compressor;

compressing the gas in the compressor to a higher predetermined final pressure;

compressing the gas with a steam turbocharger which has a drive side that is acted upon by energy contained in the exhaust gas flow of the thermal engine;

evaporating into steam a pressurized liquid of a liquid/steam circulation system with the exhaust gas flow of the thermal engine; and

feeding the steam to the drive side of the turbocharger.

5,461,862

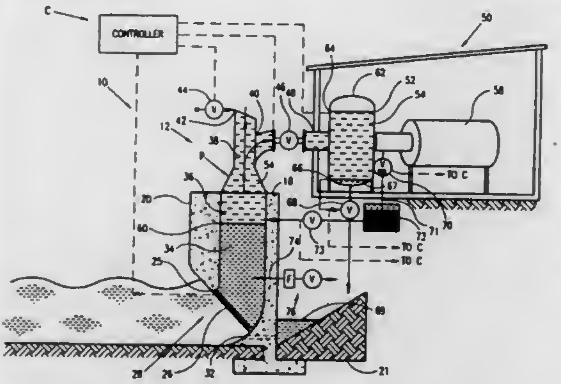
SYSTEM FOR CONVERSION OF SEA WAVE ENERGY

Shmuel Ovadia, 19 Lobetkin, Tel Aviv, Israel

Filed Oct. 13, 1993, Ser. No. 135,516

Int. Cl.^{6} F03G *7/00*

U.S. Cl. 60—641.9 **11 Claims**



1. A system for conversion of sea wave energy comprising:

(a) a breakwater structure;

(b) a wave energy collector integrally formed within said breakwater structure;

(c) an upwardly extending duct having hydraulic oil separated from seawater by a separator, said energy collector being arranged to collect and direct oncoming waves to said duct for converting the wave energy into oil pressure;

(d) a plurality of control valves electronically coupled through a computerized control system incorporated in said energy collector, said computerized control system regulating said control valves so that wave pressure is collected and transferred to said hydraulic oil;

(e) a pressure tank;

(f) a hydraulic motor mechanically coupled to an electric generator;

(g) a piping system coupling said hydraulic oil in said duct to said pressure tank and said pressure tank to said hydraulic motor.

5,461,863

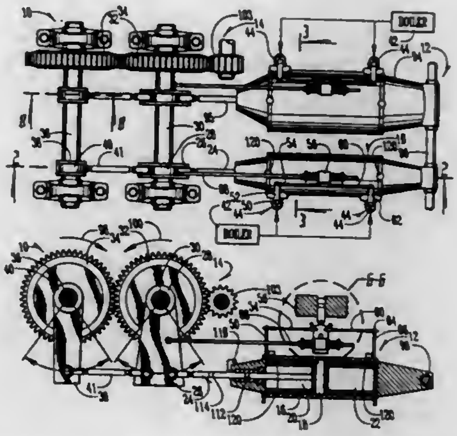
TRANSDUCER FOR CONVERTING LINEAR ENERGY TO ROTATIONAL ENERGY

Edward L. Simonds, Adel, Iowa, assignor to Thermal Dynamics, Inc., Adel, Iowa

Filed Oct. 13, 1994, Ser. No. 322,695

Int. Cl.^{6} F01K *13/00*

U.S. Cl. 60—676 **21 Claims**



1. A transducer for converting linear energy to rotational energy comprising,

a linear input power source connected to a connecting rod in turn connected to a first crank connected to a first output drive shaft having a first gear,

a second crank operatively connected to said connecting rod and to a second output drive shaft having a second gear in engagement with said first gear on said first output drive shaft,

one-way clutches interconnecting said first and second output drive shafts to said first and second cranks, and

said power source reciprocating said connecting rod back and forth in opposite directions causing said first and second output drive shafts to be continuously rotated in a single direction, respectively.

5,461,864

COOLED SUPPORT STRUCTURE FOR A CATALYST

Ralph D. Betta, Mountain View; Toru Shoji, Sunnyvale, both of Calif., and Seiichiro Tanaka, Tokyo, Japan, assignors to Catalytica, Inc., Mountain View, Calif., and Tanaka Kikinzoku Kogyo K.K., Tokyo, Japan

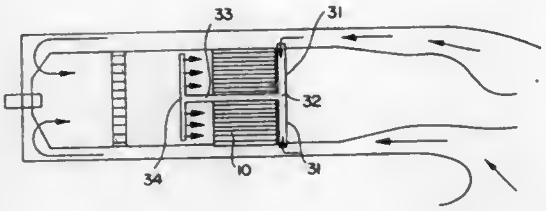
Filed Dec. 10, 1993, Ser. No. 165,966

Int. Cl.^{6} F02C *1/00*

U.S. Cl. 60—723 **20 Claims**

1. A support structure for securing within a reactor a catalyst structure made up of a multiplicity of longitudinally disposed channels for passage of a flowing gas mixture, said support structure comprising:

a plurality of hollow, elongated support members which extend through and are secured to said reactor, said hollow support members being positioned in a direction perpendicular to the longitudinal axis of said catalyst structure and positioned to abut the outlet side of said catalyst structure so as to prevent



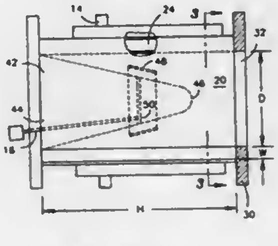
axial movement of said catalyst structure towards said support members, said support members being in fluid communication with a source of cooling medium, and said support members further having at least one aperture for exhausting said cooling medium.

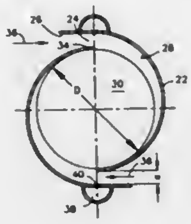
5,461,865
TANGENTIAL ENTRY FUEL NOZZLE

Timothy S. Snyder, Glastonbury; Thomas J. Rosfjord, South Windsor; John B. McVey, Glastonbury; Aaron S. Hu, Hartford, and Barry C. Schlein, Wethersfield, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Feb. 24, 1994, Ser. No. 201,310
Int. Cl.⁶ F23R *3/32*

U.S. Cl. 60—737 **11 Claims**





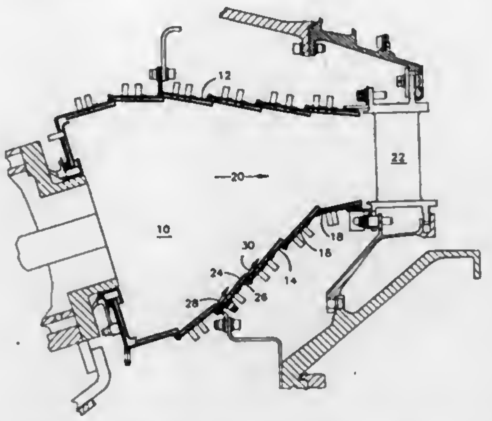
1. A low NOx burner for a gas turbine engine, comprising:
a substantially cylindrical burner chamber having an axis, having an axially extending chamber wall, and having an upstream end and an outlet end;
said outlet end having a diameter "D";
at least one longitudinally extending slot in the wall of said cylindrical chamber, said slot having an axial length and a slot wall tangential to said chamber wall;
supply means for supplying air through said slot;
a gas distribution manifold located adjacent said slot and having a plurality of axially spaced openings for delivering gas into the airflow as it passes into said slot;
a conical body located in said chamber on the axis of said chamber with the base of said conical body at the upstream end of said chamber and the apex of said conical body toward the outlet end of said chamber;
an injection zone defined as an annular volume concentric with said conical body bounded by imaginary surfaces at 30% and 80% of the distance from said conical body surface to the diameter "D", and by planes axially located from the axial center of said inlet slot a distance 10% toward said base and 20% toward said outlet end of said inlet slot axial length; and
liquid fuel injection means for atomizing fuel within said injection zone.

5,461,866
GAS TURBINE ENGINE COMBUSTION LINER FLOAT WALL COOLING ARRANGEMENT

Dennis J. Sullivan, Vernon; Aaron S. Butler, Ledyard, and Mark A. Kelley, Hartford, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 15, 1994, Ser. No. 356,089
Int. Cl.⁶ F23R *3/42*

U.S. Cl. 60—757 **4 Claims**



1. A liner arrangement for a gas turbine engine combustor having a gas flow therethrough comprising:
an arcuate shell defining a combustion zone;
said shell having axially arranged contiguous sections including a first shell section and a down stream adjacent second shell section;
said second shell section diverging with respect to said first shell section in the direction of gas flow;
a first floating liner supported from and spaced from said first shell section, and segmented around the circumference;
a first cooling flow space between said first liner and said first shell in fluid communication with said gas flow at both the upstream and downstream ends with respect to said gas flow;
a second floating liner supported from and spaced from said second shell section, and segmented around the circumference;
a second cooling flow space between said second liner and said second shell in fluid communication with said gas flow at both the upstream and downstream end with respect to said gas flow;
the downstream end of said first liner overlapping the upstream end of said second liner on the gas side thereof, and
said second cooling flow space having a smaller dimension perpendicular to said liner at the upstream end than the downstream end with respect to gas flow.

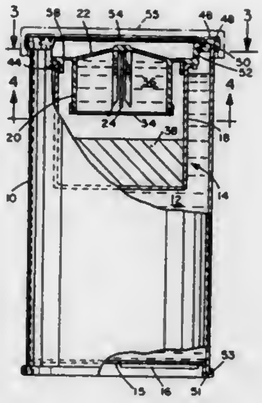
5,461,867
CONTAINER WITH INTEGRAL MODULE FOR HEATING OR COOLING THE CONTENTS

James A. Scudder, San Diego, and James L. Berntsen, Ramona, both of Calif., assignors to Insta-Heat, Inc., San Diego, Calif.

Filed May 31, 1994, Ser. No. 250,537
Int. Cl.⁶ F25D *5/00*

U.S. Cl. 62—4 **39 Claims**

1. A module for selectably mixing two materials, comprising:
a container having a container opening, said container for holding a first one of said materials;
a cap disposed in said opening of said container for selectably containing a second one of said materials, said cap having a hollow cap body having first and second ends and an axis;
a flexible member integrally formed with said cap body, said flexible member having an inner surface, an outer surface, at least one point on said inner surface moving in at least a partially axial direction with respect to said cap body between



a retracted position and an extended position in response to an axial force experienced on said outer surface of said flexible member;

at least one elongated member integrally formed with said cap body, said elongated member having a proximal end disposed at said point and a distal end projecting from said point; and

a breakable barrier attached to said second end of said cap body, said distal end of said elongated member extending beyond said second end of said cap body when said point on said inner surface is in said extended position.

5,461,868

METHOD AND DEVICE FOR GAS COOLING

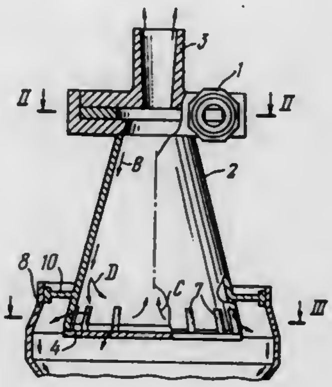
Valery E. Finko, Sankt-Peterburg, Russian Federation, assignor to Aktsionernoe Obshestvo "SIGMA-GAZ", Sankt-Petersburg, Russian Federation

PCT No. PCT/RU92/00137, § 371 Date Mar. 10, 1994, § 102(e) Date Mar. 10, 1994, PCT Pub. No. WO94/01727, PCT Pub. Date Jan. 20, 1994

PCT Filed Jul. 10, 1992, Ser. No. 211,049

Int. Cl.⁶ F25B *9/02*

U.S. Cl. 62—5 **6 Claims**



1. A method for gas cooling using a vortex tube comprising:

a) providing a vortex tube scroll and an expansion chamber;

b) swirling and accelerating a gas stream in said scroll;

c) discharging said gas stream from said scroll;

d) admitting said gas stream into said expansion chamber;

e) dividing said gas stream into an axial part and a peripheral part; and

f) discharging from said expansion chamber said peripheral part along curvilinear pathways which are joined with a pathway of said gas stream.

5,461,869

VUILLEUMIER HEAT PUMP DEVICE

Tsutomu Ishino, and Masahiro Kitamoto, both of Osaka, Japan, assignors to Daikin Industries, Ltd., Osaka, Japan

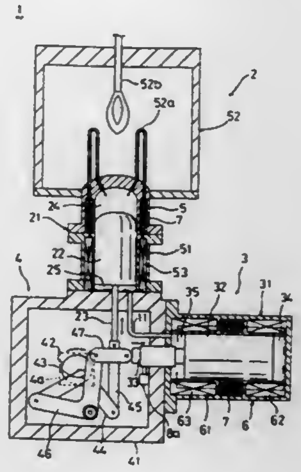
PCT No. PCT/JP93/01806, § 371 Date Aug. 25, 1994, § 102(e) Date Aug. 25, 1994, PCT Pub. No. WO94/15157, PCT Pub. Date Jul. 7, 1994

PCT Filed Dec. 13, 1993, Ser. No. 295,683

Claims priority, application Japan, Dec. 28, 1992, 4-347700

Int. Cl.⁶ F25B *9/00*

U.S. Cl. 62—6 **6 Claims**



1. A vuilleumier heat pump device comprising:

a hot-side heat pump (2) in which an inner space of a hot side cylinder (21) is defined into a hot space (24) and a middle-temperature space (25) by a hot side displacer (22), and the hot space (24) and the middle-temperature space (25) are communicated with each other through a hot side passage (5);

a cold-side heat pump (3) in which an inner space of a cold side cylinder (31) is defined into a cold space (34) and a middle-temperature space (35) by a cold side displacer (32); the middle-temperature space (35) is communicated with the middle-temperature space (25) of the hot-side heat pump (2), and the middle-temperature space (35) and the cold space (34) are communicated with each other through a cold side passage (6);

respective rods (23, 33) connected to the respective displacers (22, 32) of the hot-side heat pump (2) and the cold-side heat pump (3) and extending to the outsides of the respective cylinders (21, 31) with passing through the respective middle-temperature spaces (25, 35);

connection means (4) for connecting both the rods (23, 33) so that both the displacers (22, 32) are reciprocated at a set phase angle;

volume adjusting means (8*a*) for changing a volume of at least one of the middle-temperature spaces (35) in the hot-side heat pump (2) and the cold-side heat pump (3); and

volume control means (9*a*) for detecting a driving speed of the displacers (22, 32) and outputting, to the volume adjusting means (8*a*), a control signal for changing the volume of the middle-temperature space (35) in accordance with the driving speed.

5,461,870

SELF-REFRIGERATED METHOD OF CRYOGENIC FRACTIONATION AND PURIFICATION OF GAS AND HEAT EXCHANGER FOR CARRYING OUT THE METHOD

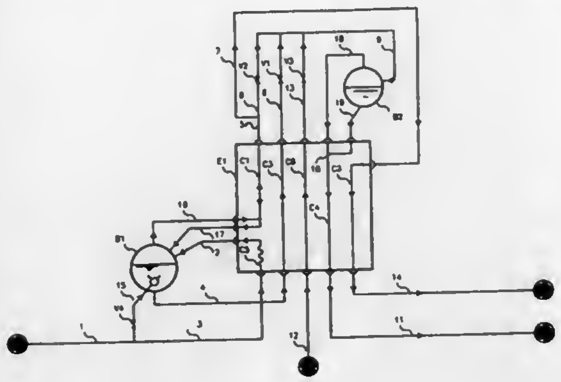
Henri Paradowski, Cergy Pontoise, France, assignor to Compagnie Francaise d'Et de Construction-Technip, Courbevoie, France

Filed Jul. 12, 1994, Ser. No. 274,179

Claims priority, application France, Jul. 15, 1993, 9308695

Int. Cl.^{6} F25J *3/00*

U.S. Cl. 62—11 **10 Claims**



1. A self-refrigerated method for the cryogenic fractionation and purification of a gaseous feed fluid with at least two components condensable at different condensation temperatures, namely at least one relatively heavy component to be removed and at least one relatively light component to be recovered so as to produce a purified gas preferably comprising the relatively light component(s) and a separated gas preferably comprising the relatively heavy component(s), wherein the improvement consists in the steps of: operating in a heat exchange zone forming a unitary assembly and comprising at least five distinct aggregately vertical circuits referred to as the first, second, third, fourth and fifth circuits, respectively, in indirect heat exchanging relationship with each other at each level of the heat exchange zone, the first circuit or reflux circuit being essentially arranged in an upper relatively colder portion of the heat exchange zone and the fifth circuit being essentially arranged in a lower and relatively less cold portion of the heat exchange zone, which method comprises circulating at least one fraction of the gaseous feed fluid aggregately from bottom to top in the fifth circuit under such conditions that it may condense in part to give a first condensate and that this first condensate be carried along without any substantial reflux by the said gaseous fluid, discharging the resulting mixture of non-condensed gas and of the first condensate from the top of the fifth circuit, separating the said non-condensed gas from the said first condensate in a phase separation zone, causing the gas thus separated to circulate aggregately from bottom to top in the first circuit or reflux circuit under such conditions that one part of the gas may give a second condensate and that this second condensate may flow back into the said first circuit and be collected at its bottom, causing at least one part of the non-condensed gas discharged from the top of the first circuit to circulate aggregately from top to bottom in the second circuit in counter-current relationship with the fluid circulating in the first circuit and then with the fluid circulating in the fifth circuit and discharging the resulting purified gas, causing the first condensate and the second condensate to circulate aggregately from bottom to top in the third circuit to there undergo a sub-cooling, discharging from the top of the third circuit the resulting sub-cooled first and second condensates, expanding them and causing them to circulate aggregately from top to bottom in the fourth circuit where they vaporize by taking heat from the fluids of the first, third and fifth circuits, at last discharging the said vaporized condensates from the bottom of the fourth circuit, these vaporized condensates constituting the separated gas.

5,461,871

INSTALLATION FOR THE DISTILLATION OF AIR

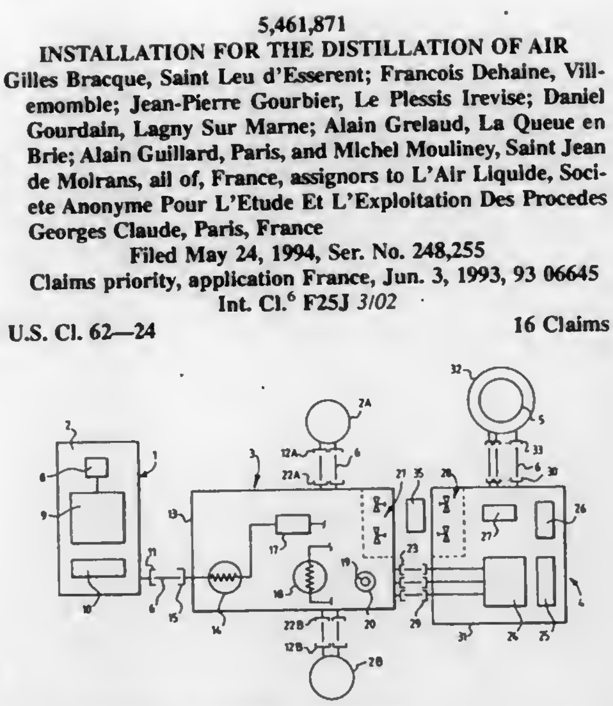
Gilles Bracque, Saint Leu d'Esserent; Francois Dehaine, Villemomble; Jean-Pierre Gourbier, Le Plessis Irevise; Daniel Gourdain, Lagny Sur Marne; Alain Grelaud, La Queue en Brie; Alain Guillard, Paris, and Michel Mouliney, Saint Jean de Moirans, all of, France, assignors to L'Air Liquide, Societe Anonyme Pour L'Etude Et L'Exploitation Des Procedes Georges Claude, Paris, France

Filed May 24, 1994, Ser. No. 248,255

Claims priority, application France, Jun. 3, 1993, 93 06645

Int. Cl.^{6} F25J *3/02*

U.S. Cl. 62—24 **16 Claims**



1. Air distillation installation comprising:

(A) air compressor means having an output connected to an outlet coupling;

(B) two cylinders for the purification of air by adsorption having inlet/outlet couplings;

(C) a first framework in which are mounted: (a) means for precooling air; (b) valves and a regeneration gas reheater; and (c) connection conduits for (a) and (b), these conduits terminating in couplings for connection to other portions of the installation;

(D) a second framework in which are mounted: (d) heat exchangers and subcoolers; (e) cryogenic valves and a cryogenic pump and an expansion turbine; and (f) conduits for connecting (d) and (e) and (f) and terminating in couplings for connection to other portions of the installation;

(E) an air distillation column provided with a plurality of couplings for the inlet and outlet of fluids; and

(F) tubes for connection between said couplings of (A) to (E).

5,461,872

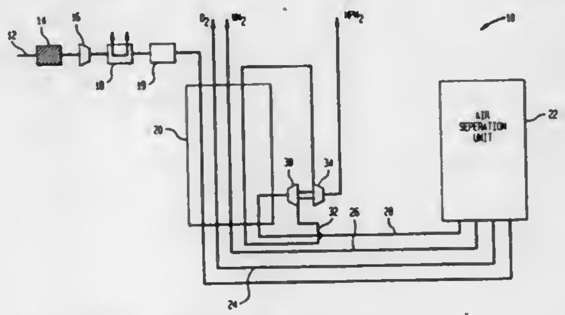
AIR SEPARATION METHOD AND APPARATUS

Robert A. Mostello, Somerville, N.J., assignor to The BOC Group, Inc., New Providence, N.J.

Filed Nov. 21, 1994, Ser. No. 342,537

Int. Cl.^{6} F25J *3/02*

U.S. Cl. 62—24 **7 Claims**



1. A method of separating air comprising:

separating the air by a low temperature rectification process having a cooling stage for cooling compressed air to a temperature suitable for its rectification, a distillation stage for

distilling the air into fractions enriched in components of the air, and process streams composed of the air and said fractions of the air flowing between said cooling and distillation stages;
forming at least one product stream enriched in one of said fractions of said air and discharging said at least one product stream from said low temperature rectification process;
partially warming or cooling at least part of a process stream to form a refrigerant stream composed of at least part of said process stream;
turboexpanding said refrigerant stream with the performance of work;
recovering refrigeration from said refrigerant stream by fully warming said refrigerant stream within said cooling stage; and
after said refrigerant stream has fully warmed, drawing said refrigerant stream at subatmospheric pressure and building pressure of said refrigerant stream to at least atmospheric pressure.

5,461,873

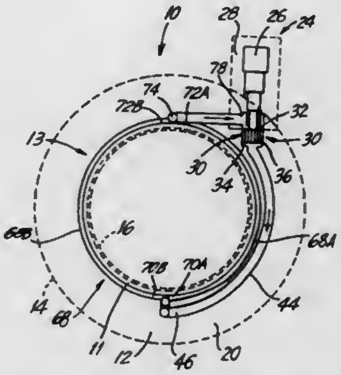
MEANS AND APPARATUS FOR CONVECTIVELY COOLING A SUPERCONDUCTING MAGNET

Ralph C. Longsworth, Allentown, Pa., assignor to APD Cryogenics Inc., Allentown, Pa.

Filed Sep. 23, 1993, Ser. No. 126,068

Int. Cl.^{6} F25B *19/00*

U.S. Cl. 62—51.1 **34 Claims**



1. A system for cooling a superconducting magnet maintained at a substantially uniform temperature, comprising:
means for convectively cooling said superconducting magnet with a flow of helium gas, said means for convectively cooling including (a) gas-containing cooling loop means, at least a portion of said cooling loop means being in heat transfer relationship with said superconducting magnet, said helium gas circulating in said cooling loop means by natural convection to remove heat from said superconducting magnet and (b) refrigeration means for removing heat from said helium gas.

5,461,874

METHOD AND APPARATUS FOR TRANSPORTING MATERIAL

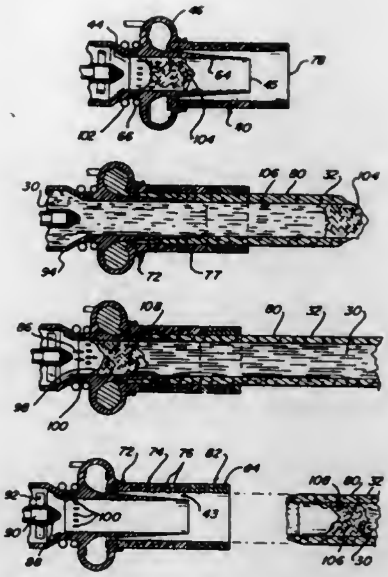
Michael C. Thompson, 520 S. Ridge St., Southern Pines, N.C. 28387

Filed Dec. 7, 1993, Ser. No. 163,892

Int. Cl.^{6} F25C *1/00*

U.S. Cl. 62—60 **17 Claims**

13. A method of transporting material from a first point to a second point, comprising the steps of:
forming a column of ice at the first point, said column having a hollow interior;
projecting core material within the hollow interior of the ice column at the first point to encase the core material within the ice column;



applying force to the ice column at the first point and transmitting the applied force through the ice column; and
projecting the ice column from the first point to the second point substantially only as a result of the force applied at the first point.

5,461,875

AUTOMATIC OUTLET OPENING/CLOSING APPARATUS OF AIR-CONDITIONER AND CONTROL METHOD THEREOF

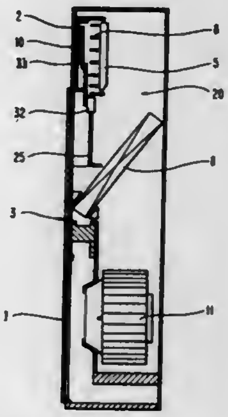
Kab Y. Lee, Suwon; Hee-Sang Yoo, Ansung, and Young C. Jang, Seoul, all of, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Jun. 21, 1994, Ser. No. 262,987

Claims priority, application Rep. of Korea, Jun. 24, 1993, 93-11612 U; Aug. 28, 1993, 93-16941; Nov. 5, 1993, 93-23124; Dec. 16, 1993, 93-28090 U

Int. Cl.^{6} F25B *49/00;* F25D *17/00*

U.S. Cl. 62—89 **6 Claims**



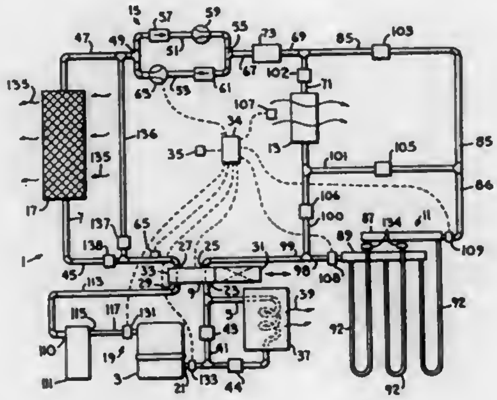
1. An air conditioner comprising:
a body having an inlet and an outlet;
a fan for circulating air from the inlet to the outlet;
a heat exchanger for exchanging heat with air being circulated;
a compressor connected to the heat exchanger for compressing refrigerant fed to the heat exchanger;
a door for opening and closing the outlet;
a door motor connected to the door for moving the door;
a door sensing mechanism for sensing the position of the door;
movable vanes disposed at the outlet for adjusting the direction of an air flow exiting the outlet; and

an automatic control system, comprising:
- an operation selection mechanism actuable by a user for actuating the air conditioner,
- an operation control mechanism connected to the operation selection mechanism and the door sensing mechanism for controlling the door motor,
- a support member disposed at the outlet on which the door motor and the movable vanes are supported, the support member including guides for guiding the door as it moves.

5,461,876

COMBINED AMBIENT-AIR AND EARTH EXCHANGE HEAT PUMP SYSTEM

William E. Dressler, 20145 W. 119th St., Olathe, Kans.
Filed Jun. 29, 1994, Ser. No. 267,661
Int. Cl.^{6} F25B *27/02*
U.S. Cl. 62—160 **37 Claims**

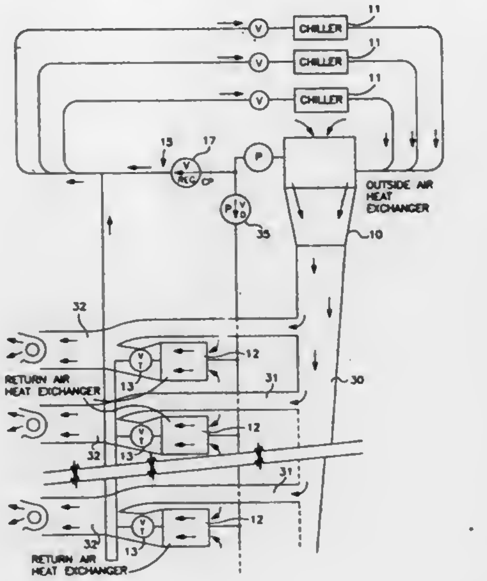


1. An apparatus comprising:
- a) a first refrigerant-based heat exchanger adapted to directly absorb thermal energy from the earth as said apparatus operates in a heating mode, and to transfer thermal energy to the earth as said apparatus operates in a cooling mode;
- b) a second refrigerant-based heat exchanger adapted to directly absorb thermal energy from the ambient atmosphere as said apparatus operates in said heating mode, and to transfer thermal energy to said ambient atmosphere as said apparatus operates in said cooling mode;
- c) a dynamic load heat exchanger adapted to utilize thermal energy received from said first and second heat exchangers as said apparatus operates in said heating mode, and to transfer thermal energy to said first and second heat exchangers as said apparatus operates in said cooling mode;
- d) a refrigerant distribution system, with refrigerant, connecting said first and second heat exchangers and said dynamic load heat exchanger in flow communication with each other;
- e) a refrigerant compression device adapted to cycle said refrigerant through said refrigerant distribution system, said first and second heat exchangers, and said dynamic load heat exchanger;
- f) control means for controlling the magnitude of thermal energy transferred by said second heat exchanger relative to the magnitude of thermal energy transferred by said first heat exchanger;
- g) a reversing valve for converting said apparatus from one of said heating and cooling modes to the other of said modes; and
- h) a regulating assembly for regulating the flow of said refrigerant through said apparatus.

5,461,877

AIR CONDITIONING FOR HUMID CLIMATES

Allan Shaw, and Russell E. Luxton, both of Adelaide, Australia, assignors to Luminis Pty Ltd., Australia
PCT No. PCT/AU92/00235, § 371 Date Jan. 24, 1994, § 102(e) Date Jan. 24, 1994, PCT Pub. No. WO92/20973, PCT Pub. Date Nov. 26, 1992
PCT Filed May 25, 1992, Ser. No. 142,414
Claims priority, application Australia, May 24, 1991, PK6304
Int. Cl.^{6} F25D *17/06*
U.S. Cl. 62—185 **19 Claims**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OUTSIDE AIR HEAT EXCHANGER
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RETURN AIR HEAT EXCHANGER
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RETURN AIR HEAT EXCHANGER

1. Air conditioning means for controlling the temperature and humidity of air in at least one space, with respect to air outside of said at least one space and heat and moisture sources within said at least one space, to a set temperature and humidity, comprising:
- an outside air heat exchanger through which said outside air passes before passing into said at least one space,
- return air treatment means comprising at least one return air heat exchanger for each said space through which air from said space passes before returning to said space,
- coolant flow conduits connecting said outside air and return air heat exchangers, the configuration of said conduits arranged so that coolant is directed first through said outside air heat exchanger and subsequently through said at least one return air heat exchanger,
- pump means to circulate coolant through said outside and return air heat exchangers,
- control means for controlling the flow rate of coolant through said return air heat exchangers,
- air flow means to create both air flow of outside air through said outside air heat exchanger into said at least one space and to create air flow of air from within said at least one space through said return air heat exchanger connected to said space before returning back into said space, and
- air flow directing means which causes air from said outside and return air heat; exchangers to mix before flowing into said at least one space, said outside air flow equalling at least the ventilation air requirements for said at least one space,
- the coolant flow through the outside air heat exchanger being such that the coolant entering said return air heat exchanger after exiting said Outside air heat exchanger is at the temperature required to cool the incoming return air to a temperature and humidity such that when the air from said outside and return air heat exchangers are mixed and supplied to said at least one space, the air in said at least one space is at said set temperature and humidity.

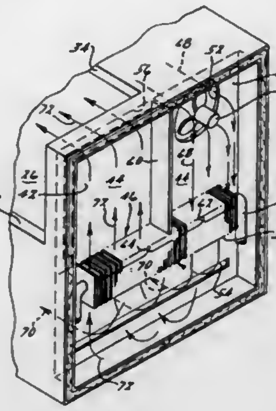
5,461,878
HEAT TRANSFER DEVICE AND METHOD

Earl H. Moore, Blanchard; Thomas J. Frick, Rosebush, and Wayne W. Smith, Mt. Pleasant, all of Mich., assignors to The Delfield Company, Mount Pleasant, Mich.

Continuation-in-part of Ser. No. 872,813, Apr. 24, 1992, Pat. No. 5,282,367. This application Feb. 1, 1994, Ser. No. 189,893

Int. Cl.^{6} A47F *3/04*

U.S. Cl. 62—255 16 Claims



1. A refrigerated cooler for containing a product, comprising:

a cabinet having a partition defining a heat transfer chamber and a thermally insulated product storage chamber having an access opening providing fluid communication between said product storage chamber and ambient air;

powered means mounted near an inlet opening defined by said partition for moving air to create a primary fluid flow from said product storage chamber into said heat transfer chamber;

a heat exchanger disposed in said heat transfer chamber;

direction controlling means for directing said primary fluid flow toward and through a first portion of said heat exchanger, thereby cooling said primary fluid flow to a first temperature, said direction controlling means adapted to split said primary fluid flow into first and second subsidiary fluid flows, and to direct said first subsidiary fluid flow through a first outlet defined by said partition into said product storage chamber, and to direct said second subsidiary fluid flow through a second portion of said heat exchanger, thereby cooling said second subsidiary fluid flow to a second temperature, said direction controlling means adapted to direct said second subsidiary fluid flow through a second outlet defined by said partition into said product storage chamber;

baffle means in said heat transfer chamber for maintaining said primary fluid flow and said second subsidiary fluid flow separate; and

flow means for directing said second subsidiary fluid flow in an air curtain across said access opening;

wherein said first temperature is greater than said second temperature, thereby more evenly cooling said chamber.

5,461,879
AIR CONDITIONER CONDENSATE SLINGER

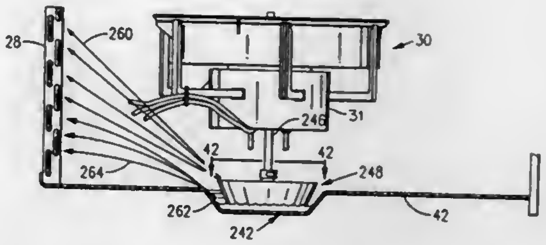
Theodore S. Bolton, Liverpool, and John H. Michaels, Baldwinsville, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Apr. 19, 1994, Ser. No. 207,998

Int. Cl.^{6} F25B *47/00*

U.S. Cl. 62—280 3 Claims

1. A condensate disposal system for an air conditioning unit of the type wherein moisture removed from inside air being cooled and dehumidified is conducted to a condensate collector in an outside section of the air conditioner, the system further includes a condensate slinger which extends into the condensate collector to pick up and distribute condensate collected therein into contact with the units condenser coil, the condensate slinger is of the type



including a truncated conical cup having an upper and lower end and a sloping conical wall extending from the upper to the lower end and surrounding an interior volume, the cup includes a bottom closing the lower end and having passages therein to allow condensate to flow into the interior volume;

wherein the improvement comprises;

providing said condensate slinger with a substantially planar bottom;

configuring said condensate collector with a planar bottom substantially parallel to said planar bottom of said slinger, and, further defining a sloping conical wall extending from the bottom thereof such that it defines a condensate collector substantially similar to the shape of said condensate slinger;

said passages in the bottom of said condensate slinger comprise circular openings extending from an inner surface to an outer surface thereof, said circular openings having a louvered section defining an inclined transition from said inner surface to said outer surface which define a leading edge at the lower surface thereof;

whereby said leading edge will encourage passage of water from said condensate collector through said passages into the interior volume of said slinger.

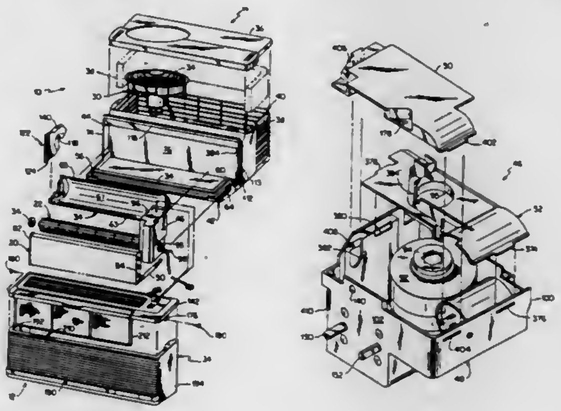
5,461,880
SNAP TOGETHER CONTROL BOX FOR AIR CONDITIONER

Theodore S. Bolton, Liverpool, and Stephen Stopyra, Syracuse, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Mar. 9, 1994, Ser. No. 208,166

Int. Cl.^{6} F25D *23/08*

U.S. Cl. 62—298 6 Claims



1. A room air conditioner comprising;

a basepan having a vertically extending partition, molded integrally therewith, separating said basepan into a substantially horizontally extending indoor section and an outdoor section;

an indoor fan assembly comprising;

a transverse fan impeller adapted to be supported in said indoor section for rotation about an axis spaced from and parallel to both said partition and said basepan indoor section;

means for supporting said impeller for rotation therewith at one end thereof;

- an enclosed control box assembly supported in part by said partition and said basepan indoor section, adjacent to the other end of said impeller, said control box having an opening in a wall thereof in axial alignment with said axis of said impeller;
- an indoor fan motor mounted within said control box and having drive means associated therewith for extending through said opening to engage said other end of said impeller to support and rotationally drive it.

5,461,881
ARRANGEMENT FOR DRIVING A WARP BEAM

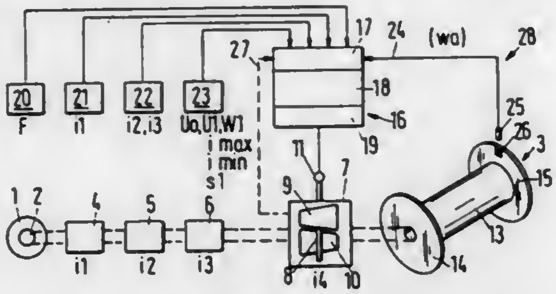
Ulrich Handel, Albstadt, and Joachim Kirchner, Mainhausen, both of, Germany, assignors to Karl Mayer Textilmashinenfabrik GmbH, Obertshausen, Germany

Filed Aug. 22, 1994, Ser. No. 293,701

Claims priority, application Germany, Aug. 27, 1993, 43 28 814.6

Int. Cl.⁶ D04B *27/20;* **D02H** *13/12;* **D03D** *49/10*

U.S. Cl. 66—210 **22 Claims**



1. Arrangement for driving a warp beam from a main shaft of a machine via a stepless adjustable drive having a displaceable coupling element for controlling step-up in said stepless adjustable drive, comprising:

- a setting means for displacing the coupling element in a direction for maintaining a predetermined thread provision rate, the setting means comprising:
- (a) a setting member having a control input and adapted to adjust said coupling element, said setting member being operable to adjust said coupling element in response to signals applied to said control input, and (b) a computing means including: (i) an input arrangement for receiving data signifying a prescribed thread provision rate as well as predetermined operating parameters of the machine, the stepless adjustable drive and the beam, which include a winding variable related to actual wind diameter, and (ii) a calculating segment for calculating the desired position of the coupling element from values received by said input arrangement to produce a signal output signifying an appropriate position signal for the setting member, said computing means being coupled to said setting member to apply said signal output to said control input.

5,461,882
REGENERATIVE CONDENSING CYCLE

Thomas M. Zywiak, Suffield, Conn., assignor to United Technologies Corporation, Hartford, Conn.

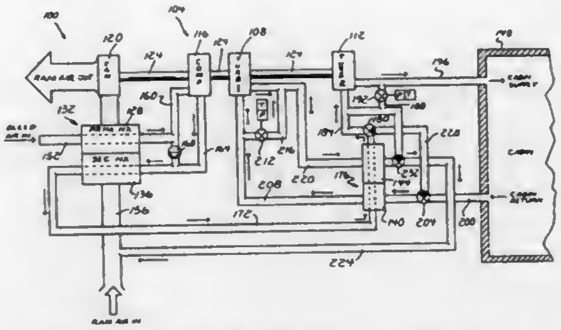
Filed Jul. 22, 1994, Ser. No. 278,822

Int. Cl.⁶ F25D *9/00*

U.S. Cl. 62—401 **11 Claims**

1. An environmental control system for conditioning air prior to passing it to an area, comprising:

- a. means for cooling air traveling along a first path using air from a first source, the first source air being fed along a second path to the means for cooling; and
- b. first turbine means for expanding and cooling the first path air, wherein conditioned air exhausted from the area is fed along a



third path to the second path where it merges with the first source air and further comprising a second turbine means, disposed in the third path, for expanding and cooling the conditioned exhaust air prior to the conditioned air merging with the first source air and is used together with the first source air for cooling the first path air.

5,461,883
COMPRESSION REFRIGERATING MACHINE

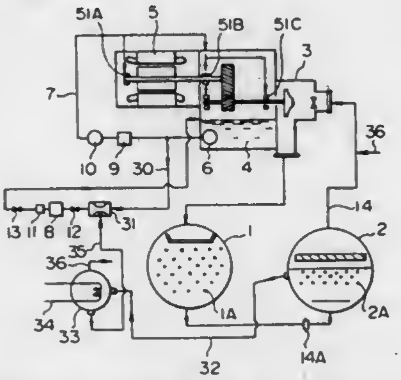
Masatoshi Terasaki, Tsuchiura, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 26, 1994, Ser. No. 186,476

Claims priority, application Japan, Jan. 26, 1993, 5-010472

Int. Cl.⁶ F25B *43/02*

U.S. Cl. 62—469 **13 Claims**



1. A compression refrigerating machine comprising a vaporizer, a condenser, a compressor for compressing a refrigerant gas from the vaporizer, a driver motor for driving said compressor, a lubricating oil line in which a lubricating oil is circulated, and a refrigerant line in which a refrigerant is circulated, wherein the lubricating oil line includes means for removing water content.

5,461,884
WARP-KNITTED TEXTILE FABRIC SHOE LINER AND METHOD OF PRODUCING SAME

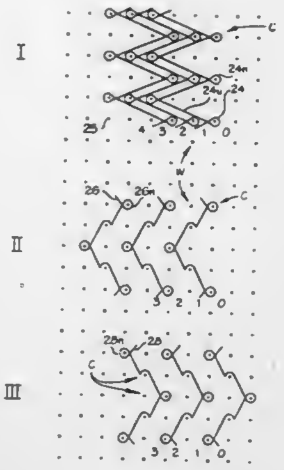
Ronald L. Depoe, Greensboro, and Sheila W. Voshell, Pleasant Garden, both of N.C., assignors to Guilford Mills, Inc., Greensboro, N.C.

Filed Jan. 19, 1994, Ser. No. 183,657

Int. Cl.⁶ D04B *21/00;* **A43B** *13/38*

U.S. Cl. 66—170 **20 Claims**

1. In a shoe having a sole and an upper affixed to the sole to define an interior foot-receiving area, a liner covering the inwardly facing surface of at least a portion of the upper, the liner comprising a warp-knitted textile fabric of at least three-bar construction having at least three sets of yarns knitted together in needle loops arranged in longitudinally extending wales and transversely extending courses in respective stitch patterns producing a compressible thickness to the fabric and having a pattern of elongated



coursewise underlaps at the technical back of the fabric to provide a relatively soft feel to the surface thereof, the liner fabric being oriented with its technical back facing inwardly of the interior foot-receiving area of the shoe, wherein at least the technical back of the fabric comprises a first surface finish including a releasable silicone for resisting abrading forces on the fabric and a second surface finish comprising a hydrophilic coating on the yarns for wicking moisture from the technical back of the fabric.

5,461,885

SUBSTRATE FOR RETAINING A HARDENABLE COMPOSITION

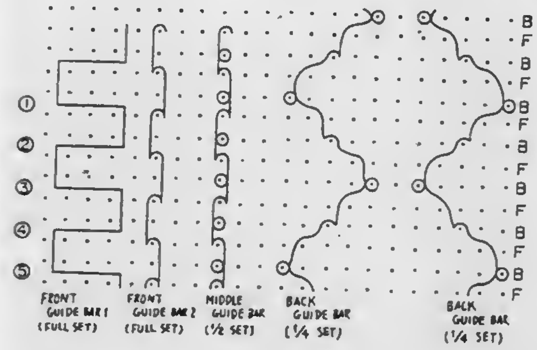
Genkichi Yokoyama, Hachioji, and Takayuki Sekine, Urawa, both of, Japan, assignors to Alcare Co., Ltd., Japan

Continuation of Ser. No. 909,795, Jul. 7, 1992, abandoned. This application Mar. 2, 1994, Ser. No. 204,812

Claims priority, application Japan, Jul. 8, 1991, 3-194853

Int. Cl.^{6} D04B *1/00*

U.S. Cl. 66—170 **17 Claims**



1. A substrate for retaining a hardenable composition comprising a double layered knit fabric formed of two overlaying knitted webs, each of said knitted webs being knitted with multiple fiber yarns forming a plurality of loops, the loops of one of the webs overlaying the loops of the other web, said loops forming a plurality of spaces between said webs, and yarns extending between said webs connecting each of said loops of said one web to at least one loop of said other web such that said two knitted webs are interlocked with each other continuously throughout said fabric, a hardenable composition applied to said substrate being able to penetrate throughout said substrate by capillarity along said yarns.

5,461,886

LOW FREQUENCY VIBRATION TYPE WASHING MACHINE HAVING SHRINKABLE SHIELDING MEANS FOR PREVENTING CLOTHES FROM JAMMING

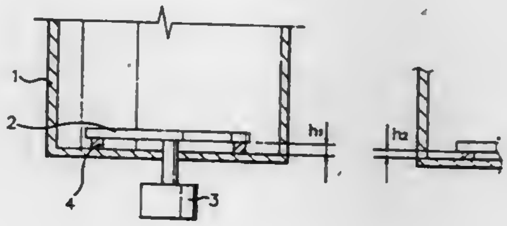
Jung C. Kim, Seoul; Dong Y. Oh; Gyu S. Choe, both of Kyungki-do; Kyung S. Hong, Inchon-Jikhalsi; Kyung H. Kim, Seoul; Joo H. Lee; Ha I. Lee, both of Kyungki-do; Kyeong B. Park, Seoul; Dong S. Gil, Seoul; Oh H. Kwon, Seoul, and Byoung H. Kwon, Busan-Jikhalsi, all of, Rep. of Korea, assignors to Goldstar Co., Ltd., Seoul, Rep. of Korea

Filed May 24, 1994, Ser. No. 248,017

Claims priority, application Rep. of Korea, May 24, 1993, 8953/1993

Int. Cl.^{6} D06F *19/00*

U.S. Cl. 68—3 SS **8 Claims**



1. A low frequency vibration type washing machine comprising:

a washing tub for receiving a multi-phase washing medium therein, said washing tub including a fixed bottom wall having an inner surface;

a shaft extending through said bottom wall and having an upper end and a lower end connected to a drive unit mounted below said bottom wall;

a rigid vibrating disc having a lower side and operating in said washing tub to cause a resonance phenomena in said multi-phase washing medium, said disc connected to the upper end of the shaft to be driven by said drive unit, the lower side of the vibrating disc disposed in uniformly spaced relation to the inner surface to create a gap; and

shrinkable shielding means disposed in the gap to prevent clothes from becoming jammed in the gap during a clothes washing operation.

5,461,887

APPARATUS FOR PRE-TREATING SOILED FABRIC ARTICLES PRIOR TO LAUNDERING

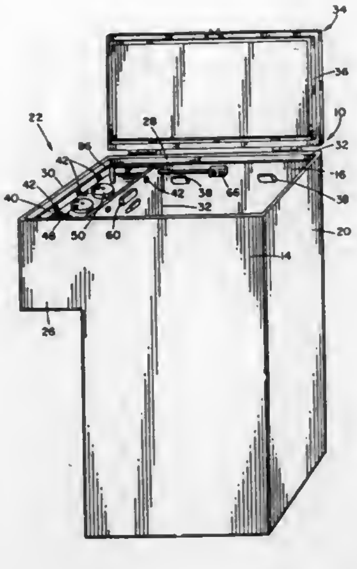
Douglas J. VonPless, 7948 Orion Path, Liverpool, N.Y. 13090

Division of Ser. No. 92,472, Jul. 16, 1993, Pat. No. 5,381,574. This application Oct. 19, 1994, Ser. No. 325,066

Int. Cl.^{6} D06B *1/02;17/00*

U.S. Cl. 68—18 F **19 Claims**

1. A hamper for pre-treating and storing soiled fabric articles prior to laundering thereof comprising, a container for receiving soiled fabric articles and having a bottom, side wall means extending upwardly from said bottom and having peripheral upper edge means providing said container with an open upper end, cover means for sealing said upper end against the ingress of air into said container, and dispensing means on said side wall means adjacent said open upper end, said dispensing means including receptacle means for storing a pre-treating liquid to be dispensed onto soiled fabric articles in said container, nozzle means for directing said pre-treating liquid from said receptacle means into said container adjacent said open upper end thereof, cyclically operable pump means for pumping a predetermined amount of said liquid from said receptacle means to said nozzle means during a cycle of operation thereof, and means to actuate said pump to operate through a cycle.

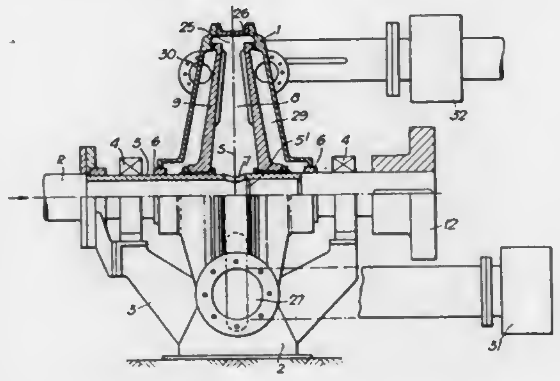


5,461,888
SUSPENSION-TREATING DEVICE

Ulf Jansson, and Rolf Ekholm, both of Karlstad, Sweden, assignors to Kvaerner Pulping Technologies Aktiebolag, Karlstad, Sweden

Filed Jun. 20, 1994, Ser. No. 262,507
Claims priority, application Sweden, Apr. 21, 1994, 9401345
Int. Cl.^{6} D06B *5/26*

U.S. Cl. 68—181 R **14 Claims**



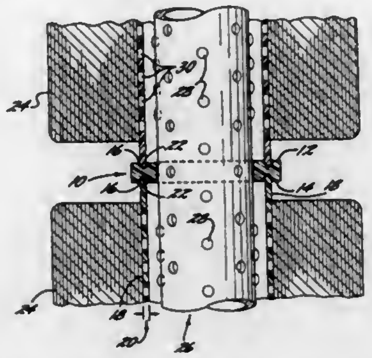
1. Device for treating a preferably cellulose-containing suspension, comprising a housing (1) on a stand (2), characterized in that it comprises an injection chamber (8) limited by two disc-shaped wall members (9) mounted having an inner part on an axle (5) on one side each of a normal plane (S) to the axle and arranged to rotate about a centre of rotation (C) common to the axle, in that the distance between the wall members (9) decreases from the axle (5) and out towards their periphery, in that at least one inlet opening (7) is disposed in the inner part of the chamber (8) for the suspension to be treated, in that outlets (27) for the treated suspension are disposed in an outer part (25) (the acceptance space) of the injection chamber (8), in that an extraction chamber (29) is disposed outside the wall members (9) of the injection chamber (8), in that openings (22) for a filtrate are disposed between the injection chamber (8) and the extraction chamber (29) within at least one annular zone of the radial extent of the wall members (9), and in that outlets (30) for a filtrate are arranged from the extraction chambers (29).

5,461,889
PLASTIC SPACER RING HAVING AN ANNULAR GROOVE FOR SEALING PLASTIC DYE TUBES

Samuel F. Adams, and Hans-Peter Bolz, both of Greenville, S.C., assignors to Sonoco Products Company, Hartsville, S.C.

Filed Sep. 2, 1993, Ser. No. 116,053
Int. Cl.^{6} D06B *23/04*

U.S. Cl. 68—189 **19 Claims**



1. A plastic spacer ring adapted for use with a plastic dye tube body of predetermined wall thickness and diameter defining opposed annular end faces and being structurally and chemically stable to dye at elevated temperatures comprising:

an annular body formed of a plastic material that is both structurally and chemically stable to dye at elevated temperatures having opposed upper and lower surfaces, each of said surfaces having an annular groove therein for receiving said end face of said plastic dye tube body, each of said grooves having a centerline of substantially the same diameter as the diameter from center to center of the wall of said plastic dye tube body and being defined in transverse cross-section by opposed side walls defining an open top and a closed bottom, wherein the width at the top of said groove is substantially greater than the wall thickness of said dye tube body and the width at the bottom of said groove is substantially less than the wall thickness of said dye tube body such that an annular void is defined between the bottom of said groove and the end face of the plastic dye tube, whereby the annular groove of the plastic spacer ring provides improved sealing with an end face of the plastic dye tube body due to separate tangential contact along both an interior surface and an exterior surface of the end face of the plastic dye tube body substantially continuously about the circumference of the plastic dye tube body.

5,461,890
HANDCUFF LEVERAGE DEVICE

Richard LeFavor, 7692 Kingsview La., Maple Grove, Minn. 55311

Filed Feb. 14, 1994, Ser. No. 195,525
Int. Cl.^{6} E05B *75/00*

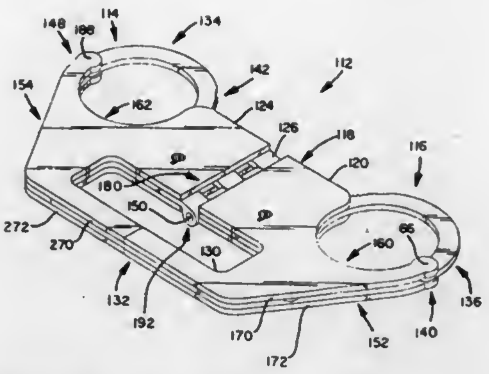
U.S. Cl. 70—16 **3 Claims**

1. Handcuff assembly for selectively locking a detainee's wrists together, said handcuff assembly comprising:

a first wrist encircling means for selectively encircling one wrist;

a second wrist encircling means for selectively encircling a second wrist;

connecting means for connecting said first wrist encircling means to said second wrist encircling means, said connecting means including a first elongated body having a first end for attaching to said first wrist encircling means and having a second end, said connecting means including a second elongated body means having a first end for attaching to said second wrist encircling means and having a second end, said second ends of said connecting means provided with cooperating hinge rings, a pin disposed between said hinge rings to pivotally couple said second ends of said first and second



elongated body means together and to selectively allow pivoting of said elongated body means; and

a first handle portion rigidly connected to the first wrist encircling means and a second handle portion rigidly connected to the second wrist encircling means, the first and second handle portions extending to abut each other and thereby defining a handle generally parallel to and spaced apart from the connecting means and defining therebetween an aperture suitable to receive a hand of an officer grasping the handle to allow said handcuff assembly to act as a leverage device to subdue an unruly detainee.

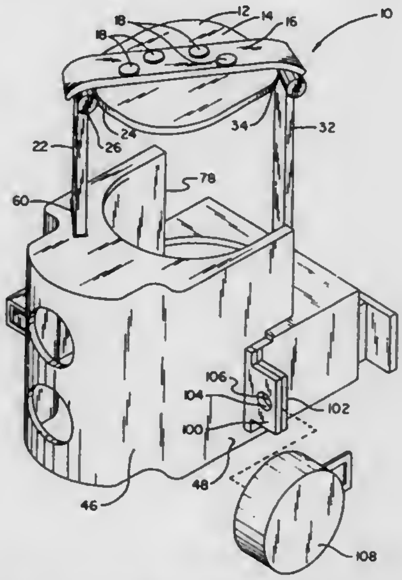
5,461,891

APPARATUS FOR SECURE POSITIONING OVER AND AROUND A STEERING WHEEL AND STEERING COLUMN TO PREVENT THEFT

Jean L. Noel, 168 Clinton Ave., Apt. #13, Jersey City, N.J. 07304

Filed May 9, 1994, Ser. No. 239,463
Int. Cl.^{6} E05B *73/00*

U.S. Cl. 70—18 **5 Claims**



1. A new and improved apparatus for secure positioning over and around a steering wheel and steering column to prevent theft comprising, in combination:

a plate positionable over the top of a central part of a steering wheel of the type having a steering column with laterally extending rods for turn signals, the plate having a short post extending downwardly from one edge thereof with an upper end pivotally secured about an axis with respect to the plate and with the lower end having an inwardly projecting leg, and having a long post extending downwardly from a second edge of the plate diametrically opposite from the first edge with an upper end pivotally secured about an axis with respect to the plate about an axis parallel with the first axis and with a lower end having an outwardly projecting leg;

a first housing half positionable around a first half of a steering column beneath a steering wheel, the first housing half having an inner wall and an outer wall and a curved intermediate wall therebetween and with parallel upper and lower faces, the upper face having an aperture for the removable receipt of the inwardly projecting leg;

a second housing half positionable around a second half of a steering column beneath a steering wheel, the second housing half having an inner wall and an outer wall and a planar linear wall therebetween with parallel upper and lower faces, the upper face having a recess for the removable receipt of the outwardly projecting leg, the upper face of the first housing half being closer to the plate than the upper face of the second housing half to define a lateral opening;

a hinge rotatable about an axis perpendicular to the axes of the posts, one end of the hinge being coupled to one edge of the second housing half and a pivot plate coupled to the other end of the hinge, the pivot plate having a slot and, a projection extending outwardly from the first housing half adjacent to the edge proximate the hinge whereby the first housing half may be coupled to the pivot plate for pivotal motion with respect to the second housing half;

a pair of radially extending tabs each with a hole therethrough, each tab secured to an associated housing half at edges thereof remote from the hinge; and

a pad lock positionable through the holes of the tabs to couple together the first housing half and second housing half and plate to preclude operation of the steering wheel and column enclosed thereby for preventing theft.

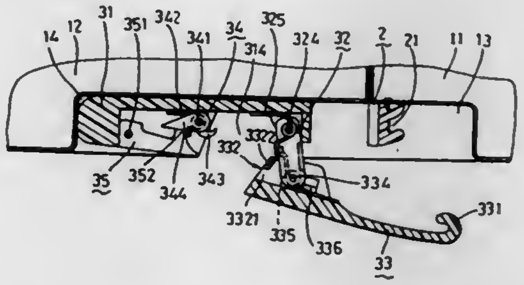
5,461,892

FASTENER FOR A SUITCASE

Dick M. Hsieh, No. 18, Lane 777, Chung-Shan Rd., Kuei-Jen Hsiang, Tainan Hsien, Taiwan, Prov. of China

Filed Jul. 14, 1994, Ser. No. 274,917
Int. Cl.^{6} E05B *65/52*

U.S. Cl. 70—73 **1 Claim**



1. A fastener for a suitcase, said suitcase having a cover and a case which is formed with a peripheral wall, said fastener comprising a retaining member which is adapted to be mounted securely on said cover, and a fastening assembly which is adapted to be mounted on said peripheral wall of said case to engage said retaining member for holding said case and said cover together, said fastening assembly including:

a base block fixed on said peripheral wall of said case, said base block having a first end portion adjacent to said retaining member, a second end portion opposite to said first end portion, and a receiving space defined between said first and second end portions;

a first swing member having a first end portion mounted pivotally on said first end portion of said base block, and a second end portion opposite to said first end portion of said first swing member;

first biasing means for biasing said first swing member to move said second end portion of said first swing member away from said receiving space of said base block;

a clasp member having a hook element formed on one end portion thereof, and an engagement element formed on the other end portion thereof, said clasp member being mounted pivotally on said second end portion of said first swing member adjacent to said engagement element;

second biasing means for biasing said clasp member to an unfolded position relative to said first swing member when said second end portion of said first swing member is biased away from said receiving space of said base block;

said first swing member and said clasp member being operable to be moved against said first and second biasing means to a folded position of said first swing member and said clasp member in which said hook element of said clasp member is depressed to engage said retaining member, and in which said second end portion of said first swing member and said engagement element of said clasp member are depressed into said receiving space of said base block;

a second swing member fulcrumed at a location inside said receiving space of said base block between said first and second end portions of said base block, said second swing member having a beak portion extending toward said first end portion of said base block, and a tail portion extending toward said second end portion of said base block, said second swing member being turnable between a first position, in which said beak portion engages said engagement element of said clasp member when said engagement element is moved inward of said receiving space, and a second position in which said tail portion is depressed to release said beak portion from said engagement element, thereby permitting said first swing member to be biased away from said receiving space and thereby disengaging said hook element from said retaining member;

third biasing means for biasing said second swing member to said first position; and

a press plate mounted pivotally on said second end portion of said base block and operable to depress said tail portion.

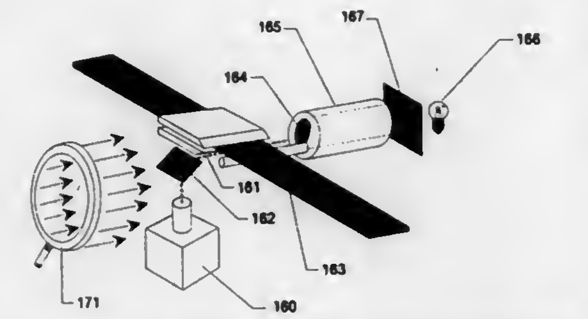
5,461,893
METHOD AND APPARATUS FOR BENDING STEEL RULE

Arthur W. Tyler, Newbury, N.H., assignor to CNC Corporation, Lowell, Mass.

Filed May 28, 1993, Ser. No. 69,614

Int. Cl.⁶ B21D *7/022;7/12*

U.S. Cl. 72—7 **34 Claims**



1. A method of forming steel rule into a predetermined shape through a series of bending operations, comprising the steps of:

(a) feeding steel rule in a longitudinal direction under control of control means to a gripping device so that a desired point of said steel rule is located at an exit end of the gripping device and a portion of said steel rule protrudes from the exit of the gripping device;

(b) gripping said steel rule in said gripping device;

(c) performing a current bending operation by deflecting the protruding portion using deflecting means under control of said control means by a calculated amount to form a bend in the steel rule at the desired point;

(d) optically analyzing a profile of said steel rule at the protruding portion to determine using said control means an actual shape of the protruding portion at completion of said current bending operation;

(e) comparing said actual shape of the protruding portion to a desired shape for said current bending operation and determining a deviation from the desired shape;

(f) determining a calculated amount for a next bending operation at least on the basis of springback in the steel rule and a desired amount for the next bending operation and the deviation determined in step (e);

(g) feeding the steel rule so that a next desired point of said steel rule is located at the exit end of the gripping device and a portion of said steel rule protrudes from the exit end of the gripping device;

(h) gripping said steel rule in said gripping device;

(i) performing a current bending operation by deflecting the protruding portion using deflecting means under control of said control means by the calculated amount determined in step (f) to form a bend in the steel rule at the desired point; and,

(j) returning to step (j) and continuing until the predetermined shape is achieved.

5,461,894
CONTROL SYSTEM FOR A HOT AND/OR COLD ROLLING PROCESS

Günter Sörgel, Nürnberg, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

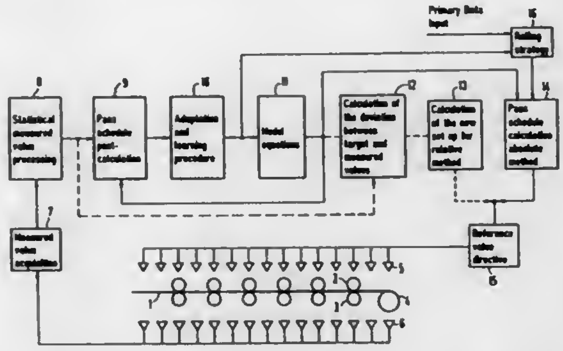
PCT No. PCT/DE92/00104, § 371 Date Aug. 20, 1993, § 102(e) Date Aug. 20, 1993, PCT Pub. No. WO92/14563, PCT Pub. Date Sep. 3, 1992

PCT Filed Feb. 14, 1992, Ser. No. 107,725

Claims priority, application Germany, Feb. 20, 1991, 41 05 321.4

Int. Cl.⁶ B21B *37/00;* **G05B** *13/04*

U.S. Cl. 72—8 **5 Claims**


Primary Data Input
15
Rolling strategy
8
Statistical measured value processing
9
Pass schedule post-calculation
10
Adaptation and learning procedure
11
Model equations
12
Calculation of the deviation between target and measured values
13
Calculation of the new set up for relative method
14
Pass schedule calculation absolute method
7
Measured value acquisition
Reference value directive
6
5
1
2
4

1. A feedback control of a rolling process that includes control units for controlling individual roll stands of a rolling mill, said control units having setpoint values determined using model equations whose model-equation parameters are varied in dependence on measured values of process variables to adapt the model equations to an actual course of the rolling process, wherein, in the event of changes in requirements of the rolling process, deviations between said measured values of said process variables and values coming from a preceding rolling process are calculated, set values are calculated based on said deviations with the aid of the model equations and said setpoint values for said control units are supplemented by said calculated set values.

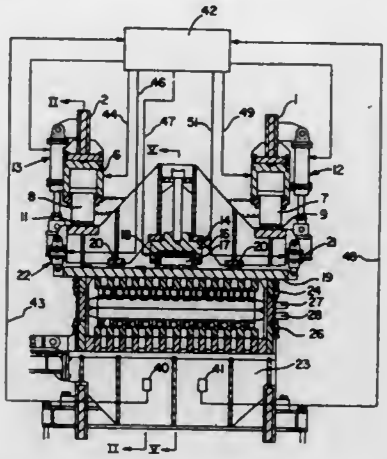
5,461,895
HIGH CAPACITY HYDRAULIC LEVELLER

Herbert Lemper, McMurray; Robert H. Ellis, Oakmont, and Richard A. Fabian, Allison Park, all of Pa., assignors to Danieli United, Inc., Pittsburgh, Pa.

Filed Dec. 9, 1993, Ser. No. 164,384

Int. Cl.^{6} B21D *1/02*

U.S. Cl. 72—21 **9 Claims**



1. An improved leveller for heavy metal plate, comprising:
a leveller housing;
a near rigid top beam mounted on the housing;
bottom beam mounted on the housing:
a single flexible beam disposed between the near rigid top beam and the bottom beam;
an upper back-up roll assembly mounted on the flexible beam;
a lower back-up roll assembly mounted on the bottom beam;
a set of four secondary bending piston/cylinder assemblies each of which is connected at one end to the top beam and connected at the other end to an end of the flexible beam;
a primary bending piston/cylinder assembly mounted on the top beam and having a lower end of the piston component thereof bearing against a convex upper surface of the flexible beam at a position intermediate the ends of the flexible beam;
the top beam having a pair of convex surfaces bearing on the flexible beam on either side of the primary bending piston/cylinder assembly;
a set of driven upper work rolls disposed below the upper back-up roll assembly and above and vertically movable with respect to a set of driven lower work rolls disposed above the lower back-up roll assembly and off-set from the upper work rolls so as to exert a levelling action on plate passed through the work rolls, and
means continuously to measure the deflection of the bottom beam and to actuate the primary and secondary bending piston/cylinder assemblies to deflect the flexible beam to an extent to compensate for the deflection of the bottom beam, thereby continuously maintaining the upper and lower work roll assemblies parallel to each other under load.

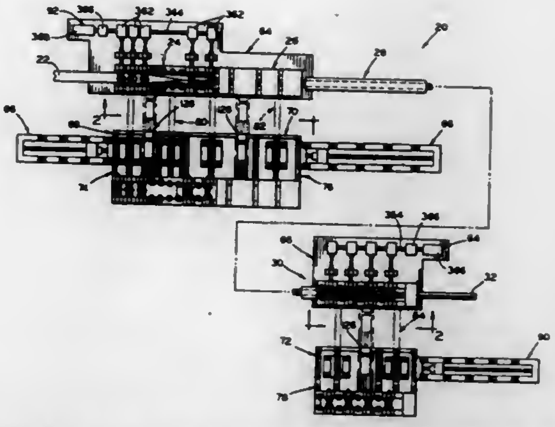
5,461,896
AUTOMATED CHANGEOVER TUBE MILL

Nelson D. Abbey, III, Monclova; Richard L. Dreier, Northwood, and Susan J. Taber, Gibsonburg, all of Ohio, assignors to Abbey Etna Machine Company, Perrysburg, Ohio

Filed Feb. 18, 1994, Ser. No. 198,479

Int. Cl.^{6} B21B *31/10*

U.S. Cl. 72—181 **13 Claims**



1. A continuous tube mill apparatus adapted for quick changeover from production of a first product to production of a second product of a different size or shape, the tube mill comprising a mill base upon which a series of forming units is operably carried for progressively forming a skelp into the finished product, a first sub-base unit upon which forming units for forming the first product are mounted, the sub-base unit being rollingly supported to enable the same to be removably mounted upon the mill base, a changeover module positioned beside and spaced from the mill base, a second duplicate sub-base unit having forming units thereon for forming the second product movably positioned upon the changeover module, bridging means selectively extendable from the changeover module to the mill base, said bridging means comprising a spaced pair of arms having rollers thereon for rollingly supporting the sub-base units for movement between the mill base and the changeover module, and means for removing the first sub-base unit from the mill base across the bridging means to the changeover module and the second sub-base unit from the changeover module across the bridging means into operative position on the mill base.

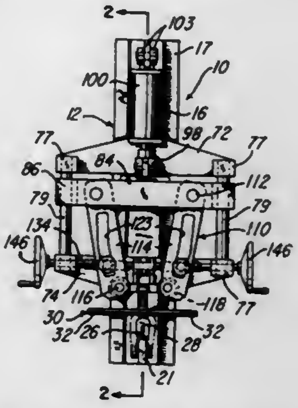
5,461,897
U-BOLT BENDING APPARATUS

John C. Gray, Dayton, Ohio, and Duane E. Shultz, Pulaski, Wis., assignors to L & H Threaded Rods Corp., Dayton, Ohio

Filed Sep. 30, 1993, Ser. No. 129,672

Int. Cl.^{6} B21K *1/74*; B21D *7/06*

U.S. Cl. 72—213 **15 Claims**



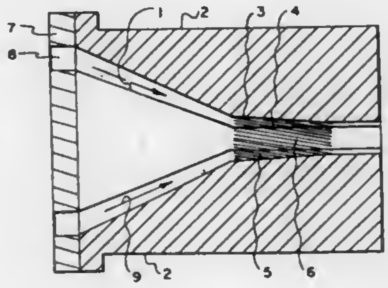
1. Apparatus for bending a straight metal rod having a center portion integrally connecting opposite threaded end portions into a U-bolt having parallel legs formed from the end portions, said apparatus comprising a frame, a forming die adapted to receive the center portion of the rod, means for clamping the rod to said forming die, a pair of arms each supporting a bending roller positioned to engage the rod, a support member pivotally supporting said arms, means secured to said frame and supporting said forming die and said support member for relative linear movement between a retracted position and an extended position, power operated means for producing said relative movement, a set of guide members positioned for moving and directing said arms and said bending rollers inwardly towards each other during said

relative movement between said forming die and said support member for overbending the rod around said forming die, an adjustment screw supported for rotation and threadably connected to said guide members, said arms and said bending rollers being movable transversely relative to said screw and said guide members during said relative movement between said forming die and said support member, and means for rotating said screw for precisely adjusting the spacing between said guide members for conveniently bending rods of different diameters into U-bolts having parallel legs.

5,461,898

METHOD AND APPARATUS FOR EXTRUSION OF TUBING SHEETING AND PROFILE SHAPES

Martin Lessen, 12 Country Club Dr., Rochester, N.Y. 14618
Continuation-in-part of Ser. No. 23,365, Feb. 26, 1993, abandoned. This application Dec. 9, 1993, Ser. No. 164,385
Int. Cl.^{6} B21C *25/02*
U.S. Cl. 72—256 **23 Claims**



1. A method for extruding material of a predetermined, walled cross-section comprising the steps of:

providing material to be extruded;

applying extruding forces to said extrudable material to produce extruded material having a predetermined, walled cross-section having opposite surfaces; and

applying a large shearing deformation to the greater part of said material being extruded with material displacement in a direction tangential to the surfaces of the material and generally perpendicular to the direction of extrusion, said displacement having a displacement gradient in a direction perpendicular to said surfaces while said extruding forces are being applied and the cross-section of the material is being reduced to produce extruded material with increased strength transverse to the direction of extrusion with a minimum of unsheared material,

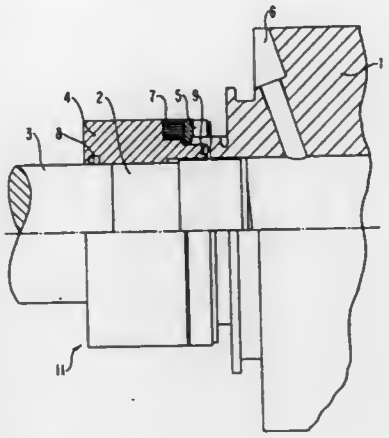
wherein said applying steps are effected by first and second dies spaced from one another; and

two sets of shearing grooves with opposing lands on said first and second dies, respectively, wherein the total extrusion flow cross-sectional area of said grooves is much smaller than the remainder of the extrusion flow cross-sectional area at any particular cross-section of said dies, and wherein the shearing deformation is applied from land-to-land through the thickness of said material.

5,461,899

SEALING DEVICE FOR AN EXTRUDER

Ole Johan Sørhelm, Torjulvågen; Kai Magne Vik, Nesbru, and Lars Auran, Sunndalsøra, all of, Norway, assignors to Norsk Hydro a.s., Oslo, Norway
PCT No. PCT/NO92/00191, § 371 Date Aug. 26, 1994, § 102(e) Date Aug. 26, 1994, PCT Pub. No. WO93/11887, PCT Pub. Date Jun. 24, 1993
PCT Filed Dec. 7, 1992, Ser. No. 98,395
Claims priority, application Norway, Dec. 10, 1991, 914844
Int. Cl.^{6} B21C *27/04*
U.S. Cl. 72—272 **17 Claims**



1. An extruder for the extrusion of metal such as aluminum, said extruder comprising:

a cylinder having an inlet end opposite an outlet end to be provided with a die;

a piston supported by a piston rod and movable thereby between a withdrawn position, whereat said piston is outwardly of the interior of said cylinder, and an extruding position, whereat said piston is within said interior of said cylinder;

a sealing device mounted to, when said piston is in said interior of said cylinder, provide a seal between said piston and said cylinder, said sealing device being movable with said piston when said piston is moved to said withdrawn position; and

a bore leading through said cylinder from an inward end at said interior to an outward end at a position on said cylinder exterior of sealing cooperation between said sealing device and said cylinder.

5,461,900

VEHICLE BODY REPAIR TOOL

Marty R. Gutierrez, Sacramento, Calif., assignor to Shamus, Sacramento, Calif.
Continuation-in-part of Ser. No. 27,840, Mar. 8, 1993, abandoned. This application Dec. 27, 1994, Ser. No. 363,991
Int. Cl.^{6} B21D *1/12*
U.S. Cl. 72—479 **18 Claims**

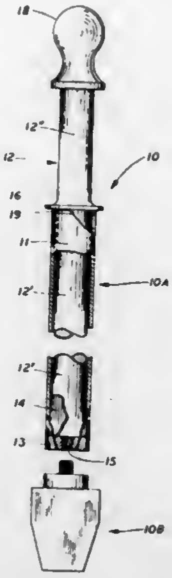
1. A device for use in confined environments for the repair of vehicles deformed from impact accidents, which device includes a main body portion and a series of tool heads, which device comprises:

a. said main body portion, comprising:

i. an elongated shaft nestable first section having distal and proximal ends with a handle being mounted at its proximal end, and a circumscribing sleeve spaced down from said handle disposed on said shaft, said sleeve defining with the distal end of said shaft a planar surface of an impact applying segment at the distal end thereof;

ii. a tubular receiving second section, adapted to receive the nestable first section therein,

said second section being constrictedly open at its proximal end and closed off by an internally disposed plug at its distal end,



said plug having a finite diameter and being threaded to threadedly engage any one of,

b. said series of interchangeable tool heads being of varying configurations each of which comprises a metal working section and a mount section attached thereto, which mount section comprises a cylindrical solid member of a finite diameter, said member having a threaded mounting shaft emanating upwardly therefrom, which shaft is engageable with the second section of said main body portion, wherein the diameter of the plug closing off the second section of the main body portion is substantially the same as the diameter of the mount portion of the tool's cylindrical solid section, and said plug and said mount portion each having a planar surface in an abutting relationship,

whereby upon utilization of said device, energy is transferred from said plug to said tool head through said cylindrical solid member.

5,461,901
TESTING APPARATUS FOR PRESSURE GAUGES IMPLEMENTING PNEUMATIC FEEDBACK TO CONTROL STEPLESS REGULATING VALVE

Nils T. Ottestad, Tonsberg, Norway, assignor to Ottestad Breathing Systems AS, Husöysund, Norway

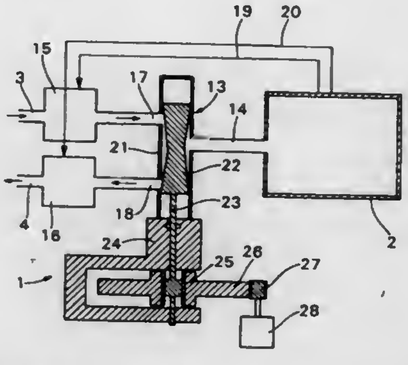
PCT No. PCT/NO92/00171, § 371 Date May 5, 1994, § 102(e) Date May 5, 1994, PCT Pub. No. WO93/08454, PCT Pub. Date Apr. 29, 1993

PCT Filed Oct. 13, 1992, Ser. No. 211,586

Claims priority, application Norway, Jan. 14, 1991, 914018

Int. Cl.^{6} G01L *27/00*

U.S. Cl. 73—4 R **5 Claims**



1. A testing apparatus for in situ calibration of pressure gauges, comprising:

a reference chamber for connection of a pressure gauge to be tested,

a calibrated pressure sensor connected to the reference chamber for generating a pressure sensor output signal,

a gas supply unit; and

a regulating means connected to the gas supply unit for regulating the pressure in the reference chamber, wherein the regulating means comprises:

a gas flow balancing means connected to the reference chamber for creating a balance between supply of gas to and delivery of gas from the reference chamber,

a first pressure regulator connected to an inlet and a second pressure regulator connected to an outlet respectively, of the flow balancing means, each of the first and second regulators being controlled by a pneumatic feedback signal from the reference chamber so that the first regulator maintains the pressure at the inlet of said flow balancing means higher than the pressure of the reference chamber, and the second regulator maintains the pressure at the outlet lower than the pressure of the reference chamber,

an electronic control circuit for generating an output signal for adjusting the flow balancing means, the electronic control circuit having a first input and a second input, the first input being the calibrated pressure sensor output signal, and the second input being a reference signal (V_{ref}).

5,461,902
APPARATUS FOR THERMALLY CONTROLLING AN OXYGEN SENSOR OF INTERNAL COMBUSTION ENGINE

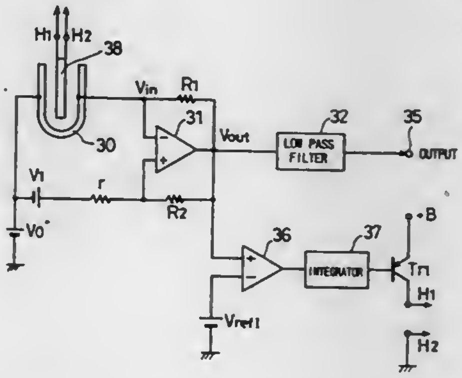
Yoichi Iwata, Susono, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Oct. 5, 1994, Ser. No. 318,103

Claims priority, application Japan, Jan. 12, 1993, 5-254516

Int. Cl.^{6} G01N *27/16;27/407*

U.S. Cl. 73—23.32 **8 Claims**



1. An apparatus for thermally controlling an oxygen sensor of an internal combustion engine, comprising:

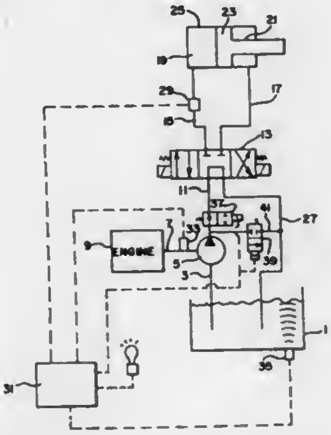
a current-limiting type solid electrolyte oxygen sensor whose electrical characteristic varies with a change in an oxygen concentration of exhaust gases from an internal combustion engine, and whose alternating current resistance varies with a change in an operating temperature of said sensor, said sensor having two electrodes;

a voltage source connected with one of said electrodes of the sensor through a first resistor to supply a given voltage to the sensor;

a differential amplifier having a first input connected with the other electrode of the sensor and a second input connected with the voltage source through the first resistor, said differential amplifier producing at its output an output signal derived from the difference between said given voltage from the voltage source and an output voltage from the sensor, and said output signal being representative of the oxygen concentration of the exhaust gases;

- a first closed loop circuit having a first feedback resistor which connects the output of the differential amplifier with the first input of the differential amplifier so as to control a current flow through the sensor;
- a second closed loop circuit having a second feedback resistor which connects the output of the differential amplifier with the second input of the differential amplifier;
- heating means for heating the sensor in accordance with an applied current;
- oscillation detecting means for detecting whether or not an oscillation at the output of the differential amplifier has occurred, and for outputting a pulse when the occurrence of the oscillation is detected; and
- current control means for applying current to said heating means to heat the sensor when said oscillation has not occurred, and for stopping the application of current to said heating means in response to the pulse from said oscillation detecting means, so as to maintain an operating temperature of the sensor at an essentially constant temperature level.

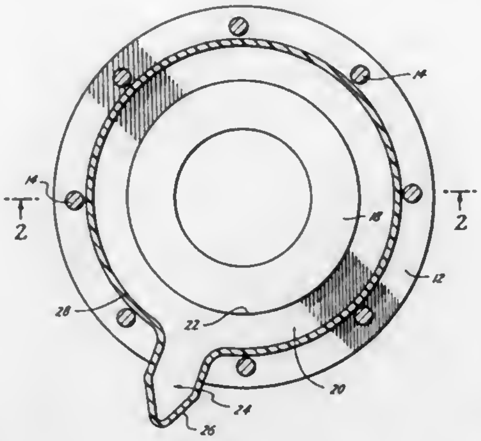
5,461,903
APPARATUS AND METHOD FOR DETECTING LEAK IN HYDRAULIC SYSTEM
Louis C. Harms, Evanston, Ill., assignor to Fluid Power Industries, Inc., Wheeling, Ill.
Filed Mar. 3, 1994, Ser. No. 206,054
Int. Cl.^{6} G01M *19/00*
U.S. Cl. 73—40 **16 Claims**



1. An apparatus for detecting a leak in a hydraulic system said leak detecting apparatus comprising:
   - (a) means for determining the actual rate of change of level in a hydraulic fluid reservoir,
   - (b) means for determining a predicted rate of change of level in the hydraulic fluid reservoir based on the capacity of the hydraulic system, and
   - (c) means for comparing the actual rate of change of level in a hydraulic fluid reservoir to the predicted rate of change of level in the hydraulic fluid reservoir wherein an excess of actual rate of change of level over predicted rate of change of level indicates a leak in the hydraulic system.

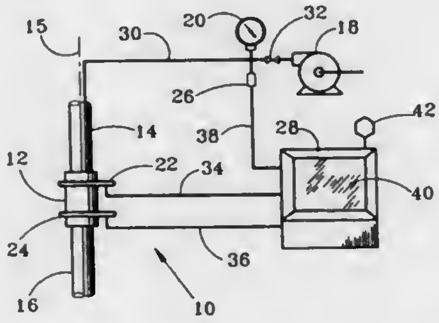
5,461,904
LEAK DETECTION MEANS AND METHOD
Peter Baker, Wales, Great Britain, assignor to Texaco Limited, London, England
Filed Sep. 13, 1993, Ser. No. 120,626
Int. Cl.^{6} G01M *3/28*
U.S. Cl. 73—46 **4 Claims**

1. A leak detector which detects leaks in a flanged joint sealed by a gasket comprising:



- a flat annular ring surrounding a gasket having a detector comprising
- a projection means adapted to extend radially outward from the flanges to the exterior in a manner so that fluid leaking beyond such gasket is identifiable at said projection means, said projection means extending in the same plane as the flat annular ring; and
- a barrier means of a molded plastic bead substantially surrounding an outer peripheral edge of the flat annular ring, said bead being so configured as to direct any leak fluid along a flow path onto the radially extending projection means.

5,461,905
METHOD AND APPARATUS FOR TESTING OILFIELD TUBULAR THREADED CONNECTIONS
Dennis J. Penisson, Raceland, La., assignor to Bilco Tools, Inc., Houma, La.
Filed Apr. 19, 1994, Ser. No. 229,573
Int. Cl.^{6} G01M *3/28*
U.S. Cl. 73—46 **19 Claims**



1. Apparatus for determining the integrity of one or more seals of an oilfield tubular threaded connection made up at a well site, comprising:
- pressurizing means for internally pressurizing the threaded connection while at the well site;
- at least one sensor for detecting radially outward deformation of the exterior surface of the threaded connection at a selected axial location along the threaded connection; and
- a computer for receiving signals from each of the at least one sensor and for determining the integrity of the threaded connection in response thereto.

5,461,906

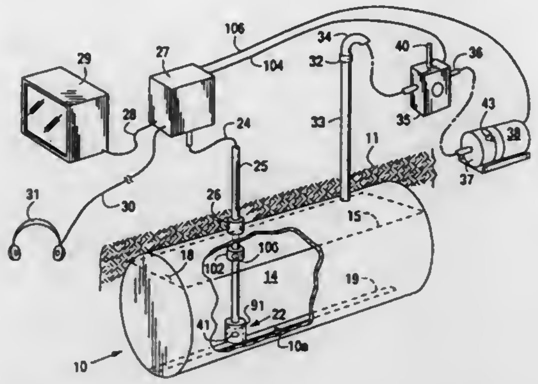
APPARATUS FOR CONFIRMING THE PRESENCE OF A LEAK IN A LIQUID STORAGE TANK

Tom G. Bogle; John E. Tuma, both of Houston, and Barry N. Williams, Rosharan, all of Tex., assignors to Tanknology Corporation International, Houston, Tex.

Division of Ser. No. 65,077, May 20, 1993, which is a continuation of Ser. No. 773,354, Oct. 7, 1991, abandoned. This application Feb. 4, 1994, Ser. No. 191,463

Int. Cl.^{6} G01M *3/24;3/32*

U.S. Cl. 73—49.2 **10 Claims**



1. Apparatus for testing a liquid storage tank for leaks comprising:

means for closing all entry and exit passages to the liquid storage tank to be tested;

a vacuum pump connected to the tank to be tested through said passage closing means for drawing a vacuum therein;

a pressure sensor within the tank to be tested; and

a control unit operably connected to said vacuum pump and said pressure sensor, said control unit being provided with software for monitoring the output signal from said pressure sensor,

turning said vacuum pump off when the output signal from said pressure sensor indicates that a first predetermined vacuum pressure level within the tank has been reached,

turning said vacuum pump on when the output signal from said pressure sensor indicates that a second predetermined vacuum pressure level within the tank has been reached, said second pressure level being higher than said first pressure level, and

measuring the time periods of pump cycling between on and off states, and comparing the duration of the time periods, with the monitoring of off cycles of relatively unchanging duration serving to confirm the presence of a leak in the tank and the occurence of off cycles of increasingly longer duration confirming the absence of a leak.

5,461,907

IMAGING, CUTTING, AND COLLECTING INSTRUMENT AND METHOD

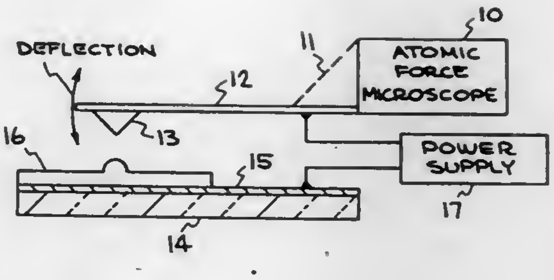
Robert J. Tench, Tracy; Wigbert J. Siekhaus, Berkeley; Mehdi Balooch, Berkeley; Rodney L. Balhorn, Livermore, and Michael J. Allen, Davis, all of Calif., assignors to Regents of the University of California, Oakland, Calif.

Filed Mar. 23, 1993, Ser. No. 35,741

Int. Cl.^{6} H01J *3/14*

U.S. Cl. 73—105 **24 Claims**

1. In an atomic force microscope, the improvement comprising: means for imaging, cutting, and collecting small objects including human chromosomes, said means including a cantilever arrangement having at least one cantilever with a knife-edge configured cutting tip thereon.



5,461,908

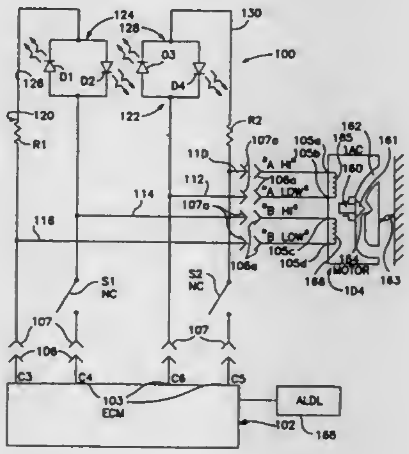
AUTOMATIVE DIAGNOSTIC TESTING APPARATUS

Richard W. Armstrong, O'Fallon, Ill., assignor to ABE Electronics, Inc., St. Louis, Mo.

Division of Ser. No. 139,558, Oct. 20, 1993, Pat. No. 5,369,991, which is a continuation of Ser. No. 859,091, Mar. 27, 1992, abandoned. This application Jul. 1, 1994, Ser. No. 269,828

Int. Cl.^{6} G01M *19/00*

U.S. Cl. 73—118.1 **10 Claims**



1. A diagnostic testing apparatus for testing the operation of an automotive idle air control (IAC) motor having a pair of operating circuits with positive and negative input signal ports and plural stepper positions for regulating engine idle speed, said operating circuits normally being directly connected to an electronic control module (ECM) of the automotive electrical system and being power controlled only by the ECM, comprising:

first means including coupling means for removably coupling said testing apparatus between the ECM and the operating circuits of IAC motor to be tested, and further including first circuit means constructed and arranged for re-establishing normal series power control connection of the ECM with each of the IAC motor operating circuits; and

second means comprising a plurality of testing circuits, each of which connects across one of the power control connections of the first circuit means in parallel with the associated operating circuit of the IAC motor, each testing circuit being responsive to the ECM power control to the associated operating circuit and including at least one indicator device for indicating an operating condition of the associated operating circuit.

5,461,909

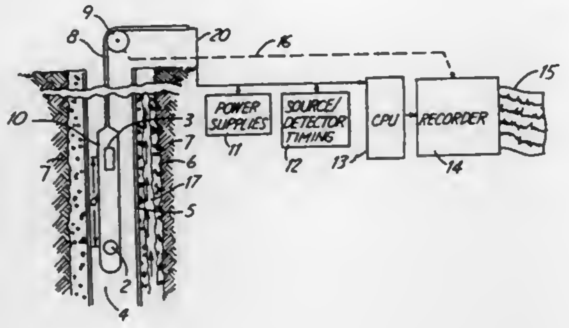
OXYGEN ACTIVATION METHOD FOR QUANTITATIVE WATER FLOW MEASUREMENTS WITHIN AND BEHIND WELL BORE CASING

Dan M. Arnold, Katy, Tex., assignor to Halliburton Logging Services, Inc., Houston, Tex.

Continuation of Ser. No. 64,249, May 21, 1993, abandoned. This application Sep. 23, 1994, Ser. No. 311,517

Int. Cl.^{6} E21B *47/00;* G01F *13/00;* G01N *23/00;* G01V *5/00*

U.S. Cl. 73—155 **14 Claims**



8. A method for measuring linear flow velocity, radial position, direction of flow, and volume flow rate of water flowing in the vicinity of a well borehole, comprising the steps of:

(a) providing a well logging tool having a source of 14 MeV neutrons and a first and second gamma ray detectors;

(b) positioning said first detector longitudinally above said neutron source within said well logging tool;

(c) positioning said second detector longitudinally below said neutron source within said well logging tool;

(d) positioning said well logging tool within the well borehole at a depth at which water flow measurements are desired;

(e) irradiating the well borehole environs, including any water present, with said 14 MeV neutrons from said neutron source, thereby inducing radioactive nitrogen-16 within the water by neutron irradiation of the oxygen component of the water through O-16(n,p)N-16 reaction;

(f) after terminating neutron irradiation with said neutron source, operating said first and said second gamma ray detectors to generate signals representative of the decay of N-16 isotope as a function of time following termination of irradiation with said neutron source;

(g) determining the linear flow velocity of the water from N-16 activity as a function of time following termination of said irradiation using a predetermined relationship;

(h) determining radial distance to the center of the water flow by a measure of the rate of build-up and decay of N-16 activity as a function of time following termination of said irradiation using a predetermined relationship;

(i) determining the total measured N-16 activity following termination of said irradiation using a predetermined relationship;

(j) combining said linear flow velocity, said radial distance, and total N-16 activity measurements to determine volume flow rate using a predetermined relationship; and

(k) comparing the response of said upper gamma ray detector with said lower gamma ray detector to determine the direction of the flow of the water.

5,461,910

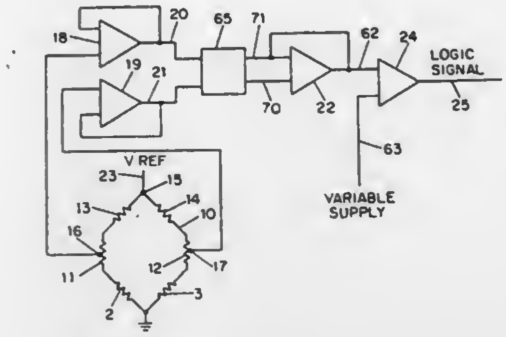
FLUID FLOW DIRECTION AND VELOCITY MONITOR

Price R. Hodson, Glen Ellyn; Federico Chu, Glenview; Arnold Buchanan, Deerfield, and Robert E. Montividas, Hanover Park, all of Ill., assignors to Alnor Instrument Company, Skokie, Ill.

Filed Jun. 16, 1994, Ser. No. 261,285

Int. Cl.^{6} G01F *1/68*

U.S. Cl. 73—170.12 **6 Claims**



1. A fluid flow direction monitor having a fluid flow channel with a first opening and a second opening for detecting a presence of fluid flow in a specified fluid flow direction, said fluid flow direction and threshold velocity monitor comprising:

a first thermal sensor disposed within said fluid flow channel, said first thermal sensor having an electrical resistance that is a function of its temperature;

a second thermal sensor disposed within said fluid flow channel, said second thermal sensor distal to said first opening relative to said first thermal sensor, said second thermal sensor having an electrical resistance that is a function of its temperature;

a heated element disposed between said first and second thermal sensors in said fluid flow channel;

a bridge circuit having a first bridge arm comprising said first thermal sensor and a second bridge arm comprising said second thermal sensor;

a first voltage detection means electrically coupled to said first bridge arm for detecting voltage across said first thermal sensor and outputting a first output voltage proportional to the electrical resistance of the first thermal sensor;

a second voltage detection means electrically coupled to said second bridge arm for detecting voltage across said second thermal sensor and outputting a second output voltage proportional to the electrical resistance of said second thermal sensor;

a selection switch electrically coupled to said first voltage detection means and said second voltage detection means for selecting the specified fluid flow direction, said selection switch outputting a selected voltage and a nonselected voltage;

a differential amplifier means electrically coupled to said selection switch for amplifying the difference between said selected voltage and said nonselected voltage, said differential amplifier means outputting a first voltage;

an adjustable reference voltage source for supplying a stable reference voltage; and

a comparison amplifier electrically coupled to the output of said differential amplifier means and said adjustable reference voltage source for outputting a first logic signal indicating whether said differential amplifier means output voltage is greater than said reference voltage,

whereby said first logic signal indicates a presence of fluid flow in the specified fluid flow direction through the fluid flow channel.

5,461,911

FLOW TRANSDUCER MUFF

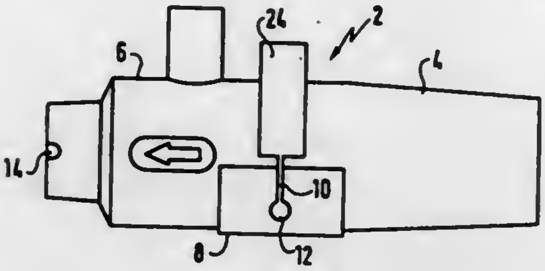
Sture Eriksson, Vallentuna, and Rolf Edstroem, Bromma, both of, Sweden, assignors to Siemens Elema AB, Solna, Sweden

Filed Mar. 21, 1994, Ser. No. 210,466

Claims priority, application Sweden, Apr. 22, 1993, 9301345

Int. Cl.^{6} G01F *15/14*

U.S. Cl. 73—201 **6 Claims**



1. A flow transducer muff for positioning a substantially right-angled parallelpiped-shaped flow transducer in an expiration channel of a ventilator, said flow transducer muff comprising:
   - first and second muff halves each having a gas tight channel therein and
   - respectively shaped to receive a parallelpiped-shaped flow transducer therebetween and comprising means for connecting said channels to opposite sides of said parallelpiped-shaped flow transducer; and
   - an elastic connecting link attaching said first muff half to said second muff half and comprising means for permitting said first and second muff halves to be bent around said connecting link for inserting said parallelpiped-shaped flow transducer between said muff halves and for holding said muff halves against said parallelpiped-shaped flow transducer to produce a substantially gas tight connection between said channels.

5,461,912

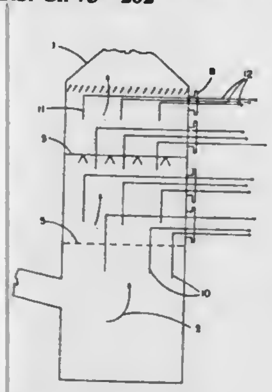
ACCURATE METHOD OF MEASURE TRAY PRESSURE DROP TO DETERMINE LIQUID FLOW IN FLUE GAS DESULFURIZATION SYSTEMS

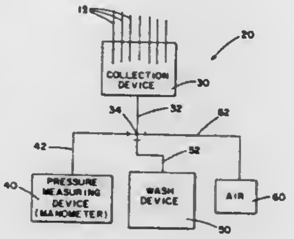
Wadie F. Gohara, Barberton, Ohio, assignor to The Babcock & Wilcox Company, New Orleans, La.

Filed Jun. 1, 1994, Ser. No. 252,024

Int. Cl.^{6} G01F *5/00*

U.S. Cl. 73—202 **15 Claims**





1. An arrangement for measuring a pressure caused by a flow at a component contained within a flue gas desulfurization vessel, the arrangement comprising:
   - tube means near the component for receiving a portion of the flow and channeling the portion of the flow from the vessel;
   - collection means for receiving the portion of the flow channeled from the vessel;
   - means for measuring the pressure at the component based on the portion of the flow received by the tube means, the measuring means being operatively connected to the collection means;
   - means for cleaning the tube means, the cleaning means being operatively connected to the collection means;
   - means for drying the tube means, the drying means being operatively connected to the collection means; and
   - valve means for regulating the operation of the means for measuring pressure, the cleaning means and the drying means.

5,461,913

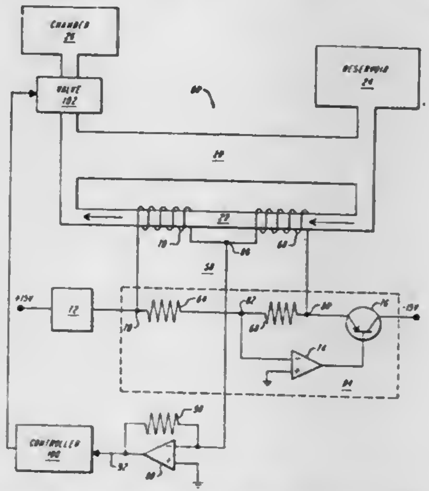
DIFFERENTIAL CURRENT THERMAL MASS FLOW TRANSDUCER

Luke D. Hinkle, Townsend, Mass., and James Provost, Derry, N.H., assignors to MKS Instruments, Inc., Andover, Mass.

Filed Jun. 23, 1994, Ser. No. 264,706

Int. Cl.^{6} G01F *1/68*

U.S. Cl. 73—204.25 **41 Claims**



14. A mass flow control system including (a) a control valve for controlling the rate of fluid flow through a conduit, (b) a transducer for sensing the rate of fluid flow through said conduit as a function of the difference in temperature between first and second regions of said conduit and for generating a control signal as a function or said rate of fluid flow, and (c) a mass flow controller for controlling the operation of said valve as a function of said control signal; said transducer comprising:
- A) a bridge including
  - (i) first, second, third and fourth nodes;
  - (ii) means for defining a fast resistance between the first and second nodes;
  - (iii) means for defining a second resistance between the second and third nodes;
  - (iv) first thermal element means, disposed in said first region, for defining a third resistance between the first and fourth nodes, having a resistance value as a function of the temperature in said first region; and
  - (v) second thermal element means, disposed in said second region, for defining a fourth resistance between the fourth and third nodes, having a resistance value as a function of the temperature in said second region;
- B) first control means for controlling a voltage across said first and second resistances so that a voltage at said second node is maintained at a predetermined reference level; and

C) second control means for maintaining a voltage at said fourth node at said predetermined reference level and for generating an output signal as a function of the difference between the resistance values of said third resistance and of said forth resistance and representative of the rate of flow of fluid through said conduit.

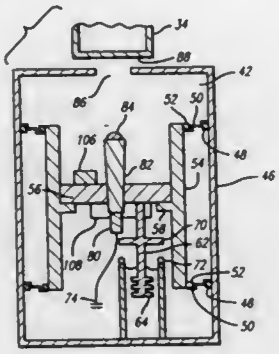
5,461,914
OPTICAL FIBER GRAVITY METER

Mark A. Zumberge, San Diego; Eric L. Canuteson, La Jolla, and Paul R. Parker, San Diego, all of Calif., assignors to The Regents of the University of California, Oakland, Calif.

Filed Mar. 14, 1994, Ser. No. 212,731

Int. Cl.⁶ G01M *1/12*

U.S. Cl. 73—382 R **22 Claims**



1. A gravity meter, comprising:

a laser for generating a light beam;

an optical fiber having a first end in light communication with the laser and a second end, wherein the second end of the fiber establishes a fixed reflector for reflecting a first portion of the light beam back through the optical fiber and for permitting a second portion of the light beam to propagate through the fixed reflector;

a seismometer mass for holding the fixed reflector to attenuate the propagation of vibrations to the fixed reflector;

a droppable reflector in light communication with the second end of the fiber for reflecting the second portion of the first beam back through the optical fiber;

a detector in light communication with the first and second portions of the light beam for detecting interference fringes generated by the interaction between the first and second portions of the light beam; and

an elevator for holding the droppable reflector, wherein the elevator can be distanced from the droppable reflector to cause the droppable reflector to fall, and wherein the elevator gradually decelerates to gently contact the droppable reflector.

wherein the interference fringes are representative of the displacement of the droppable reflector relative to the fixed reflector.

5,461,915
MOUNTING HOUSING MADE OF PLASTIC FOR POINTER-TYPE MEASURING UNITS

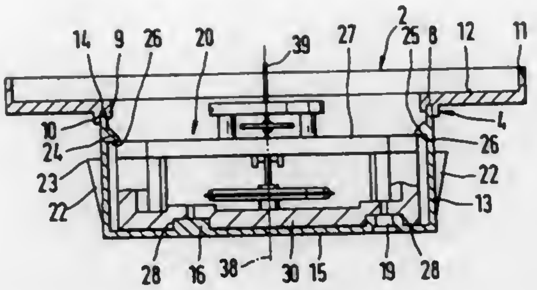
Adolf Heyler, Weigheim, Germany, assignor to Orka Optik GmbH, Weigheim, Germany

Filed Oct. 21, 1994, Ser. No. 327,093

Claims priority, application Germany, Jan. 23, 1993, 9316219 U

Int. Cl.⁶ G01L *7/08*

U.S. Cl. 73—431 **10 Claims**



1. A mounting housing formed of plastic for a pointer-type measuring unit which has a central pointer shaft with a pointer movable over a ring dial, comprising: an essentially cylindrical housing box including a housing bottom formed in one piece with a box wall and with a housing box open wall edge, said housing box being provided with elastically deformable snap-in elements on an interior for automatically holding an inserted measuring unit, said housing box having ratchet tooth-like fastening elements on an exterior for fastening said housing box in a recess of a measuring instrument holder, said box wall of said housing box being elastically deformable; a ring flange, said ring flange being fitted to said housing box into a dimensionally stable assembly unit via detachable positive-locking connections, said ring flange having a rear side with a double walled centering ring forming an annular groove, said housing box open wall edge being fittingly accommodated in said annular groove.

5,461,916
MECHANICAL FORCE SENSING SEMICONDUCTOR DEVICE

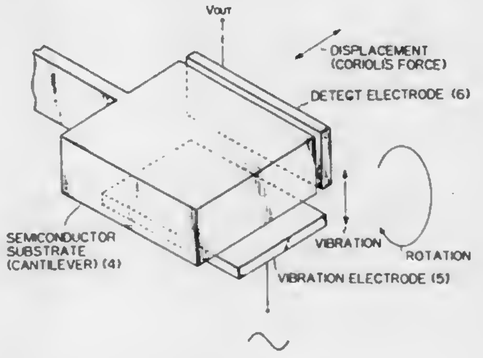
Tetsuo Fujii, Toyohashi, and Masahito Imai, Chita, both of, Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Aug. 20, 1993, Ser. No. 109,504

Claims priority, application Japan, Aug. 21, 1992, 4-223072; Jan. 12, 1992, 4-273202; Apr. 2, 1993, 5-077151

Int. Cl.⁶ G01P *15/125*

U.S. Cl. 73—514.32 **8 Claims**


Vout
DISPLACEMENT (CORIOLIS FORCE)
DETECT ELECTRODE (6)
SEMICONDUCTOR SUBSTRATE (CANTILEVER) (4)
VIBRATION
ROTATION
VIBRATION ELECTRODE (5)

1. A semiconductor mechanical sensor comprising:

a semiconductor substrate;

a beam structure extending in spaced relation over said semiconductor substrate,

a weight formed at an end of said beam structure and including first and second surface areas, said weight being movable along a predetermined axial direction;

a first electrode formed on a surface of said semiconductor substrate and facing said first surface area on said weight;

a second electrode formed on another surface of said semiconductor substrate, said second electrode facing said second surface area formed on said weight and in a direction generally perpendicular to the direction in which said first electrode faces and perpendicular to said predetermined axial direction;

said first electrode and said first surface area adapted to have a continuous change in potential difference applied therebetween so that the weight oscillates in said predetermined axial direction, and wherein movement of said weight produces a change in capacitance between said second surface area and said second electrode to enable said sensor to detect mechanical forces acting thereon.

5,461,917
ACCELERATION SENSOR

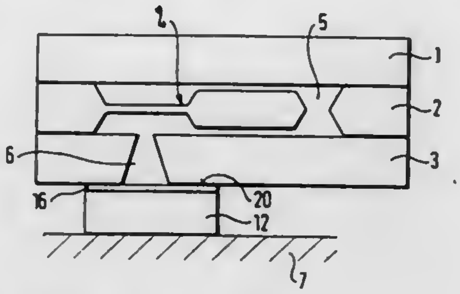
Jiri Marek; Dietrich Schubert, both of Reutlingen; Helmut Baumann, Gomaringen; Horst Muenzel, Reutlingen; Michael Offenberg, Tuebingen, and Martin Willmann, Reutlingen, all of, Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Oct. 5, 1993, Ser. No. 131,821

Claims priority, application Germany, Jan. 10, 1992, 42 34 238.4

Int. Cl.^{6} G01P *15/125*

U.S. Cl. 73—514.16 **12 Claims**



1. An acceleration sensor, comprising:
a first outer silicon plate;
a second outer silicon plate, at least one of the first outer silicon plate and the second outer silicon plate having a hole therethrough;
a middle silicon plate located between the first outer silicon plate and the second outer silicon plate, the first outer silicon plate, the middle plate and the second outer silicon plate defining a hollow space, the hollow space being aligned with the hole, the middle plate having an acceleration-sensitive moveable element disposed within the hollow space; and
an additional plate connected to one of the first outer silicon plate and the second outer silicon plate for closing the hole in an air-tight manner.

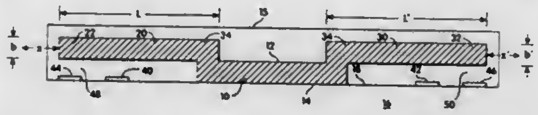
5,461,918
VIBRATING BEAM ACCELEROMETER

George Mozurkewich, Plymouth, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Apr. 26, 1993, Ser. No. 1,690

Int. Cl.^{6} G01P *15/08*

U.S. Cl. 73—514.26 **15 Claims**



1. An accelerometer comprising a substrate, a base mounted on the substrate, one or more pairs of cantilevered beams joined to the base, drive means operatively associated with each beam for driving said beams in vibration at a resonant frequency, and sensing means operatively associated with each beam for detecting changes in the resonant frequency of each beam; wherein
each of said cantilevered beams has a fixed end and a free end, and the beams within each pair of cantilevered beams are aligned along a common major axis or along parallel major axes such that the major axes of the two said cantilevered beams within a pair extend in opposite directions away from their respective fixed ends.

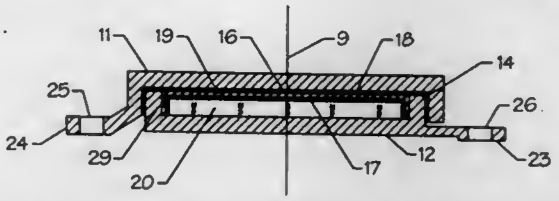
5,461,919
LOW-PROFILE MAGNETOHYDRODYNAMIC MOTION SENSOR FOR AN ELECTRONIC SYSTEM

Darren R. Laughlin, Albuquerque, N.M., assignor to Maxtor Corporation, San Jose, Calif.

Filed Oct. 22, 1993, Ser. No. 141,869

Int. Cl.^{6} G01P *15/08*

U.S. Cl. 73—514.03 **33 Claims**



1. A low-profile motion sensor supported on a printed circuit board (PCB), the sensor comprising:
a magnet covered by an insulating layer;
a lower case member having an opening bounded by a lower case sidewall, the opening having a dimension sufficient to surround the magnet, and the magnet establishing a magnetic field oriented aligned with a central axis of the lower case member;
an upper case member having an insulative surface, the upper case member having a width which is larger than the dimension of the opening such that when the upper and lower case members are conformably engaged, a space is formed bounded by the insulative surface of the upper case member, the lower case member sidewall, and the insulating layer covering the magnet;
a conductive liquid disposed within the space, the lower case sidewall providing a first electrode and the upper case member providing a second electrode through a hole in the insulative surface, both the first and second electrodes contacting the conductive liquid; and
wherein a relative angular movement of the upper and lower case members with respect to the conductive liquid in the presence of the magnetic field causes a voltage to be generated between the first and second electrodes.

5,461,920
WHOLE-BODY TEST SYSTEM WITH A TEST PROBE MOUNT DESIGNED ESPECIALLY AS A ROTOR WHICH IS MOUNTED ON A VERTICALLY ADJUSTABLE SUPPORT PLATFORM AND HAS A TEST-PIECE MANIPULATOR

Reinhard Prause, St. Augustin; Ottokar Patzke, Erfstadt-Lieblar; Reinhard Pawelletz, Dusseldorf, and Bernhard Harbach, Erftstadt-Friesheim, all of, Germany, assignors to Krautkramer GmbH & Co., Germany

PCT No. PCT/DE91/00989, § 371 Date Feb. 2, 1993, § 102(e) Date Feb. 2, 1993, PCT Pub. No. WO92/11533, PCT Pub. Date Jul. 9, 1992

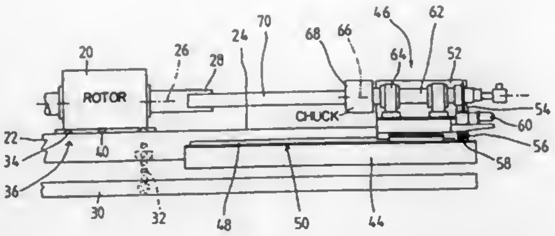
PCT Filed Dec. 18, 1991, Ser. No. 75,553

Claims priority, application Germany, Dec. 20, 1990, 40 40 870.1

Int. Cl.^{6} G01N *29/22*

U.S. Cl. 73—622 **9 Claims**

1. Ultrasonic whole-body test system comprising;
a rotor being operable to mount a test probe and to receive an object to be tested, the rotor having a rotor axis and being coupled to a vertically adjustable support platform;
a manipulator operable to receive a calibration-piece, the manipulator having a manipulator axis and being coupled to the vertically adjustable support platform;



a longitudinal guide, which runs transversely to the rotor axis and the manipulator axis, the longitudinal guide being coupled between the support platform and at least one of the rotor and the manipulator such that the manipulator can move relative to the rotor between a rest position in which the rotor axis and the manipulator axis coincide and a service position in which the object to be rested can be received by the rotor.

5,461,921

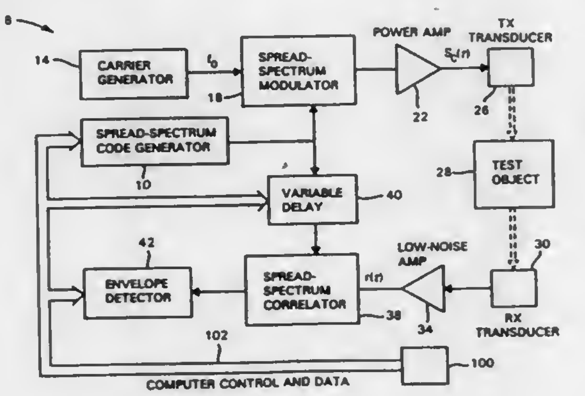
DIRECT-SEQUENCE SPREAD-SPECTRUM ULTRASONIC TESTING DEVICE

Emmanuel P. Papadakis; Steve F. Russell, and Samuel J. Wormley, all of Ames, Iowa, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Jul. 13, 1993, Ser. No. 91,179

Int. Cl.⁶ G01N *29/10*

U.S. Cl. 73—628 **58 Claims**



1. An ultrasonic testing device comprising:

means for phase-modulating a carrier signal with a pseudo-random coded signal to generate a continuous wave wide-band electrical input signal, the coded signal having a code length which is sufficiently high to produce spectral components in the electrical input signal which are in substantial continuum;

transmitting means responsive to the electrical input signal and acoustically coupled to a test object for transmitting an ultrasonic interrogation signal having the spectral components of the electrical input signal into the test object;

receiving means acoustically coupled to the test object for receiving an ultrasonic signal returned from the test object in response to the ultrasonic interrogation signal and for converting the received signal into an electrical output signal; and

means for cross-correlating the electrical output signal with a segment of a time-delayed replica of the pseudo-random coded signal to demodulate the electrical output signal and obtain a signal response from the test object.

5,461,922

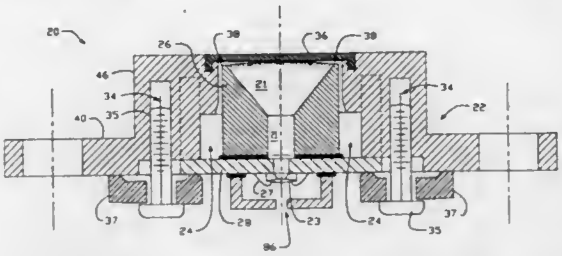
PRESSURE SENSOR ISOLATED WITHIN HOUSING HAVING INTEGRAL DIAPHRAGM AND METHOD OF MAKING SAME

Edward F. Koen, Danville, Calif., assignor to Lucas-Novasensor, Fremont, Calif.

Filed Jul. 27, 1993, Ser. No. 98,182

Int. Cl.⁶ G01L *9/00*

U.S. Cl. 73—756 **23 Claims**



1. A pressure transducer for measuring pressure within a measurand environment comprising:

a header which includes a substantially nondeformable molded housing formed from first material having a thermoplastic base material defining a cavity; said cavity having a first opening formed therein; a resilient diaphragm formed from a second material having the same thermoplastic base material as said first material; said diaphragm molded to the said housing and spanning the first opening; and

a pressure sensing device secured in place within the housing; and

a pressure transfer medium disposed within the cavity so as to couple the diaphragm to said pressure sensing device.

5,461,923

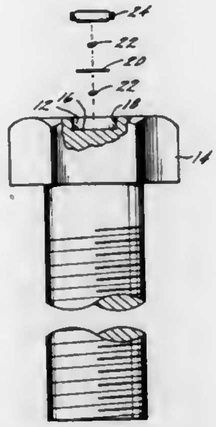
ACOUSTIC TRANSDUCER, TRANSDUCERIZED FASTENER AND METHOD OF MANUFACTURE

Jesse R. Meisterling, East Hampton, Conn., assignor to Raymond Engineering Inc., Middletown, Conn.

Filed May 16, 1994, Ser. No. 243,629

Int. Cl.⁶ F16B *31/02*

U.S. Cl. 73—761 **17 Claims**



1. A fastener adapted for load measurement including:

a fastener having first and second ends;

a piezoelectric element permanently mounted on one end of said fastener; and contact means permanently attached to said piezoelectric element, said contact means including:

a layer of insulating material having first and second opposed sides;

a first electrode on said first side of said insulating material, a second electrode on said second side of said insulating material;

one of said first and second electrodes being bonded to said piezoelectric element; and

connecting means to establish electrical contact between said first and second electrodes.

5,461,924
SENSOR ARRANGEMENT FOR INSTALLATION IN CARRIAGEWAYS AND RUNWAYS

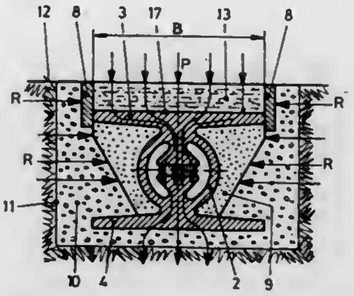
Reto Calderara, Winterberg; Lothar Jahreiss, Zürich; Hans C. Sonderegger, Neftenbach, and Markus Caprez, Zürich, all of, Switzerland, assignors to K.K. Holding AG, Switzerland

Filed Jul. 7, 1994, Ser. No. 271,661

Claims priority, application Switzerland, Nov. 23, 1993, 03482/93

Int. Cl.^{6} G01M *5/00*

U.S. Cl. 73—786 **20 Claims**



1. Sensor arrangement for installation in roadways' or runways' surfaces, for detecting one or more of the weights and dynamic reactions of vehicle wheels comprising:

a hollow section sensor with a measuring arrangement inside it and press-fitted against the wall of a tubular part; and

a force introduction flange joined tangentially to the tubular part to concentrate and amplify the forces, acting perpendicular to and along said surface, onto the measuring arrangement.

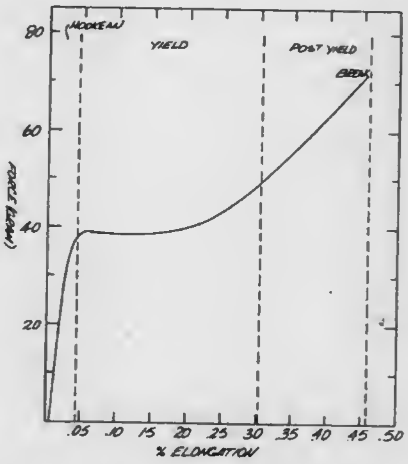
5,461,925
ASSESSMENT OF DAMAGE IN KERATIN FIBERS

Nghi V. Nguyen, Simi Valley; David W. Cannell, Los Angeles, and Roger A. Mathews, Newbury Park, all of Calif., assignors to Redken Laboratories, Inc., New York, N.Y.

Filed Mar. 28, 1994, Ser. No. 218,565

Int. Cl.^{6} G01D *7/02*

U.S. Cl. 73—789 **44 Claims**



1. A method for analyzing keratin fiber comprising the steps of:

measuring a first force required to obtain a first value of elongation of a keratin fiber, wherein the first force is less than the force required to reach the break point elongation region of the force-elongation curve;

measuring a second force required to obtain a second, relatively higher, value of elongation of a keratin fiber wherein the second force is less than the force required to reach the break point elongation region of the force-elongation curve;

determining a force ratio of the second force and the first force;

determining a representation of fiber elongation that occurs as measured from substantially no elongation to a break point of the fiber; and

determining at least one analysis factor that is directly proportional to a nonlinear mathematical function of the force ratio and the representation of fiber elongation.

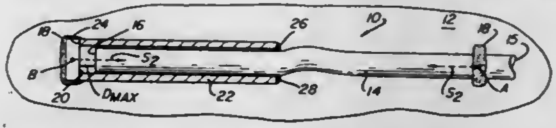
5,461,926
SINGLE-ENDED OPTICAL FIBER STRAIN SENSOR FOR MEASURING MAXIMUM STRAIN

Lloyd C. Bobb, Horsham, and Howard D. Krumboltz, Chalfont, both of Pa., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 30, 1994, Ser. No. 269,473

Int. Cl.^{6} G02B *6/02;* **H01D** *5/16*

U.S. Cl. 73—800 **6 Claims**



1. Apparatus for sensing and retaining for later measurement the maximum displacement in a given direction which has occurred between a first location and a second location, comprising:

an optical waveguide capable of transmitting light therethrough and having a flat end, attachable on a portion of the outer surface thereof to the first location;

a reflective surface attachable to the second location and positioned so that the flat end of said optical waveguide is in contact with said reflective surface;

a tube having two ends, attached at one end thereof to said reflective surface for slidably enclosing the flat end of said optical waveguide therein; and

means for providing a frictional force between said optical waveguide and said tube, the frictional force being of a magnitude that allows said optical waveguide to slide with respect to said tube when the displacement increases the distance between the first and second locations, but does not allow said waveguide to slide with respect to said tube when the displacement decreases the distance between said first and second locations.

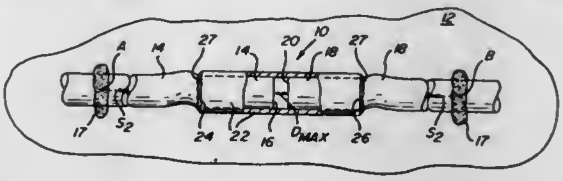
5,461,927
OPTICAL FIBER STRAIN SENSOR FOR MEASURING MAXIMUM STRAIN

Lloyd C. Bobb, Horsham, and Howard D. Krumboltz, Chalfont, both of Pa., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 30, 1994, Ser. No. 272,915

Int. Cl.^{6} H01J *5/16;* **G02B** *6/02*

U.S. Cl. 73—800 **6 Claims**



1. Apparatus for sensing and retaining for later measurement the maximum displacement in a given direction which has occurred between a first location and a second location, comprising:
- a first optical waveguide capable of transmitting light therethrough and having a flat end, attachable on a portion of the outer surface thereof to the first location;
- a second optical waveguide capable of transmitting light therethrough and having a flat end, attachable on a portion of the outer surface thereof to the second location and positioned so that the flat ends of said first and second waveguides are in contact with each other across their entire surfaces;
- a tube for slidably enclosing the flat ends of said first and second optical waveguides therein; and
- means for providing a frictional force between said first and second optical waveguides and said tube, the frictional force being of a magnitude that allows said first and second optical waveguides to slide with respect to said tube when the displacement increases the distance between the first and second locations, but does not allow said waveguides to slide with respect to said tube when the displacement decreases the distance between said first and second locations.

5,461,928
DEVICE FOR COMPRESSING A SPECIMEN AT HIGH TEMPERATURE, IN PARTICULAR FOR ADVANCED TENSILE MATERIALS

Raymond Azzolini, St. Germain les Arpajon, and Pierre Rochard, Orphin, both of, France, assignors to Commissariat a l'Energie Atomique, Paris, France

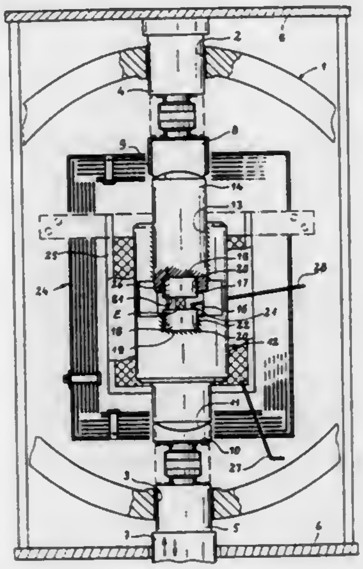
PCT No. PCT/FR92/00968, § 371 Date Jun. 14, 1994, § 102(e) Date Jun. 14, 1994, PCT Pub. No. WO93/08456, PCT Pub. Date Apr. 29, 1993

PCT Filed Oct. 14, 1992, Ser. No. 211,539

Claims priority, application France, Jan. 15, 1991, 91 12686

Int. Cl.⁶ A01J *21/00*

U.S. Cl. 73—818 **6 Claims**



1. A device for compressing a specimen (E), which comprises:
- a fixed support assembly (4,14,17) supporting the specimen and a mobile piston assembly (7,12,18) compressing the specimen, the support assembly and piston assemblies respectively having first and second planar faces (21,21) in contact with and supporting the specimen, the specimen being compressed between the first and second planar faces (21,21) wherein the support and piston assemblies each comprise a swivel joint (9,11), and wherein a part of the mobile piston assembly having the first planar face (21) slidably engages a part of the fixed support assembly having the second planar face (21).

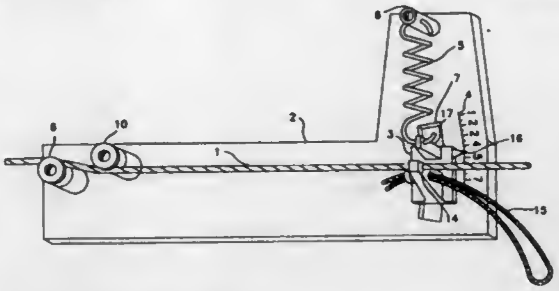
5,461,929
TENSIOMETER

Donald J. Jordan, 113 Evergreen La., Glastonbury, Conn. 06033

Filed Sep. 7, 1994, Ser. No. 302,105

Int. Cl.⁶ G01N *3/08*

U.S. Cl. 73—831 **16 Claims**



1. A tensiometer comprising:
- frame means, said frame means including an elongated guide slot, said guide slot being defined by a pair of oppositely disposed parallel walls;
- a first support member affixed to and extending from said frame means, said first support member being in part sized and shaped to engage an elongated member the tension of which is to be measured;
- carriage means movably mounted on said frame means, said carriage means including a projection sized and shaped to engage said elongated member, the movement of said carriage means being generally transverse to the axis of an elongated member engaged by and extending between said projection and said first support member, said carriage means further including a shaft which moves in said guide slot, said shaft having an axis which defines an axis of rotation of said carriage means, said shaft having a shape characterized by a cross-sectional dimension which exceeds the width of said slot whereby a predetermined amount of rotation of said shaft will establish contact between said shaft and said oppositely disposed walls of said guide slot;
- a second support member affixed to and extending from said frame means, said second support member being in part sized and shaped to engage said elongated member, said second support member being located intermediate said first support member and said carriage means;
- means applying a known force in a first direction to said carriage means;
- means for selectively applying a force to said carriage means in opposition to said known force whereby said carriage means projection may be moved to a position where it may engage said elongated member, release of said selectively applied force subsequent to said engagement of said elongated member by said carriage means projection causing said elongated member to be deflected about said second support member as a function of said known force; and
- means providing an indication of the magnitude of the deflection of said elongated member in response to the application of said known force thereto.

5,461,930
APPARATUS AND METHOD FOR MEASURING TWO-OR THREE-PHASE FLUID FLOW UTILIZING ONE OR MORE MOMENTUM FLOW METERS AND A VOLUMETRIC FLOW METER

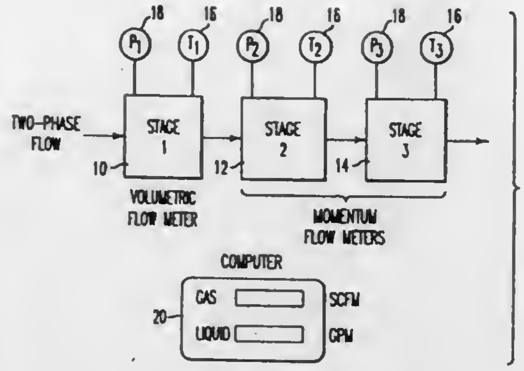
David Farchi, Houston, Tex., and Joram Agar, Grand Cayman, Cayman Islands, assignors to Agar Corporation Inc., Houston, Tex.

Filed Mar. 17, 1992, Ser. No. 852,554

Int. Cl.⁶ G01F *1/44*

U.S. Cl. 73—861.04 **25 Claims**

1. An apparatus for measuring flow rates of gas and liquid components in a fluid flowing in a flow path, comprising:



volumetric flow meter means for measuring a total flow rate for said fluid and outputting a corresponding total flow rate signal;
first and second momentum flow meter means coupled in series in said flow path with said volumetric flow meter means for measuring the momentum flux of said fluid and outputting respective first and second momentum signals;
processor means coupled to said volumetric flow meter means and said first and second momentum flow meter means for determining the flow rate of said gas component and the flow rate of said liquid component by solving predetermined equations for total flow and momentum or energy utilizing said total flow rate signal and said first and second momentum signals; and
indicator means for displaying the determined flow rates of said liquid and gas components.

5,461,931
MEASUREMENT SYSTEM

Michael J. Gill, Milford on Sea, Great Britain, assignor to British Gas PLC, London, Great Britain

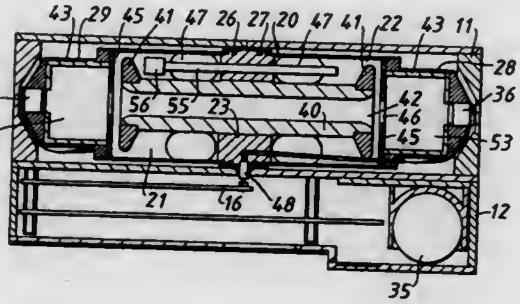
PCT No. PCT/GB92/01728, § 371 Date Nov. 8, 1993, § 102(e) Date Nov. 8, 1993, PCT Pub. No. WO93/06440, PCT Pub. Date Apr. 1, 1993

PCT Filed Sep. 16, 1992, Ser. No. 87,791

Claims priority, application United Kingdom, Sep. 16, 1991, 9119742

Int. Cl.^{6} G01F *1/66*

U.S. Cl. 73—861.28 **22 Claims**



15. A method for measuring the flow of fluid through a duct, said method comprising:
transmitting a signal from a first transducer through the flow path of the fluid for receipt by a second transducer;
switching the transducers to allow transmission to be effected by the second transducer for receipt by the first transducer;
determining the speed of flow of the fluid from the transducer signal transmission times; and
performing a correction measurement for removing transducer delay errors to ensure the accuracy of the fluid speed measurement,
wherein the correction step is performed by measuring the time for a signal transmitted by a third transducer to pass down two paths of known lengths separate to those from the first and second transducers.

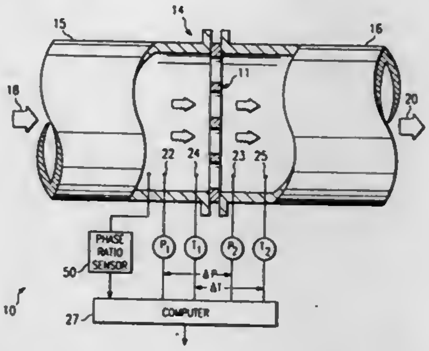
5,461,932
SLOTTED ORIFICE FLOWMETER

Kenneth R. Hall; Gerald L. Morrison, both of College Station, and James C. Holste, Bryan, all of Tex., assignors to Texas A & M University System, College Station, Tex.

Continuation-in-part of Ser. No. 729,934, Jul. 15, 1991, Pat. No. 5,295,397. This application Jan. 26, 1994, Ser. No. 188,050

Int. Cl.^{6} G01F *1/42;* **F15D** *1/02*

U.S. Cl. 73—861.61 **7 Claims**



1. A flow impedance device for conditioning a flow of a multiphase fluid through a flowmeter for determining the rate of the flow in a conduit having a circular cross-section, the flow impedance device comprising:
a circular plate defining a plurality of substantially parallel slots each having an area, a depth and a width;
wherein said area substantially equals four times said width squared; and
wherein said plate is installed in the conduit such that the fluid flows through said slots.

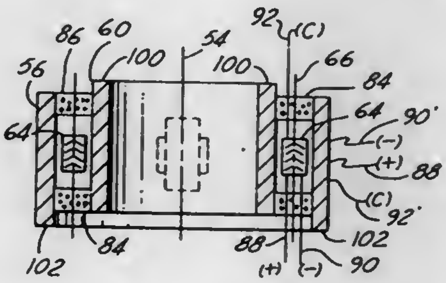
5,461,933
SHEAR WEB LOAD CELL HAVING THERMAL COMPENSATION

Kenneth D. Ives, Lebanon, and John T. McClellan, Farmdale, both of Ohio, assignors to Acutus Industries, Inc., Pontiac, Mich.

Filed Feb. 4, 1994, Ser. No. 192,090

Int. Cl.^{6} G01L *2/04*

U.S. Cl. 73—862.623 **17 Claims**



1. A system for detecting a force applied by a force application means to a wall of a casting mold, comprising:
a sensing element mounted intermediate said wall and said force application means for converting said force into a deformation;
transduction means mounted on said sensing element so as to leave a portion of said transduction means exposed for con-

verting said deformation into a signal indicative of said deformation, said exposed portion of said transduction means being coated by a relatively low durometer polymer for providing a barrier to corrosive vapors.

5,461,934

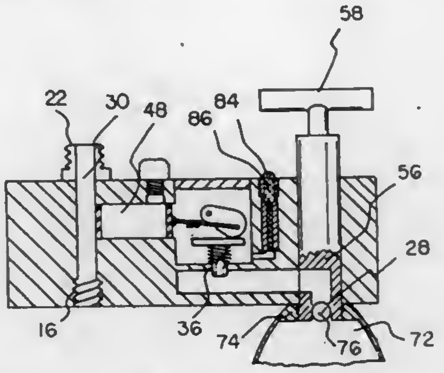
AMBIENT AIR COLLECTION DEVICE FOR USE WITH A SELF-CONTAINED BREATHING APPARATUS

Alexander G. Budd, 9 Carman Blvd., Brookhaven, N.Y. 11719

Filed Dec. 20, 1994, Ser. No. 359,440

Int. Cl.^{6} G01N ***1/14;*** **A62B** ***9/02***

U.S. Cl. 73—864.52 **5 Claims**



2. An ambient air collection device comprising:

a primary induction valve having a body, an air inlet, an air outlet, an ambient air output port, a channel formed within the body and extended between the air inlet and air outlet for transferring breathable air therebetween, an actuation chamber formed within the body and having an input port coupled to the channel and an output port coupled to the ambient air output port, an ambient air intake valve coupled to the actuation chamber for delivering ambient air thereto, switch means positioned within the input port and output port of the actuation chamber with the switch means having a biased orientation for allowing transfer of ambient air within the actuation chamber to the ambient air output port based upon detection of a flow of breathable air through the channel and an unbiased orientation for preventing such transfer when no flow is detected; and

a removable hollow vacuum pressurized vacuum test cylinder coupled to the ambient air output port for collecting ambient air therefrom.

5,461,935

SLIP CLUTCH LINEAR ACTUATOR

Jason J. Hill, Manchester, Mo., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Jan. 18, 1994, Ser. No. 167,696

Int. Cl.^{6} F16H ***57/10***

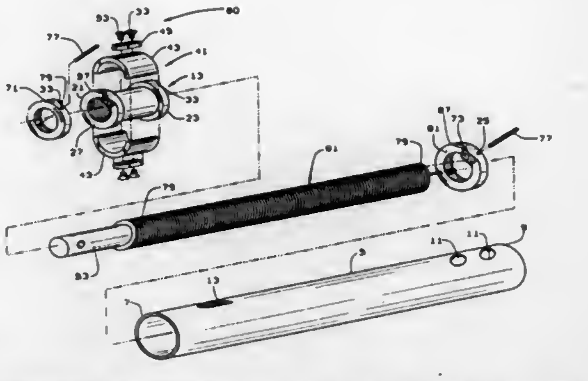
U.S. Cl. 74—424.8 R **21 Claims**

1. A linear actuator comprising

a hollow drive tube;

a two-piece shoe, each piece of said shoe being semicylindrical and having a substantially uninterrupted inner surface, said two-piece shoe being positionally fixed within said hollow drive tube;

a slip clutch received in said two-piece shoe for rotation about an longitudinal axis, said two-piece shoe positionally fixing said slip clutch axially with respect to said robe, said slip clutch being internally threaded and having a first outboard face and a second outboard face, each said outboard face having a camming surface, said slip clutch having a substantially uninterrupted outer surface frictionally engaged with said inner surface of said two-piece shoe;



a threaded shaft threadably received in said slip clutch, such that said drive tube will be moved axially relative to said shaft as said shaft is rotated; and

first and second stop nuts, each said stop nut having a camming surface and being fixed to said shaft to rotate therewith, said first stop nut being fixed to one end of said shaft on a first side of said slip clutch and said second stop nut being fixed to an end of said shaft opposite of said first stop nut on a second side of said slip clutch, said stop nuts being mounted to said shaft such that their respective camming surfaces face the camming surfaces of said slip clutch, the distance between said stop nuts defining the length of a path of travel of said shaft in said tube;

said slip clutch being made of a material such that it can freely rotate in said two-piece shoe when said slip clutch is engaged with a respective one of said stop nuts and frictionally engage said two-piece shoe when said slip clutch is between said stop nuts such that said slip clutch will remain rotationally fixed with respect to said two-piece shoe so that said tube is moved linearly along said path when said threaded shaft is rotated.

5,461,936

MOTORCYCLE CONTROL LEVER CONNECTOR

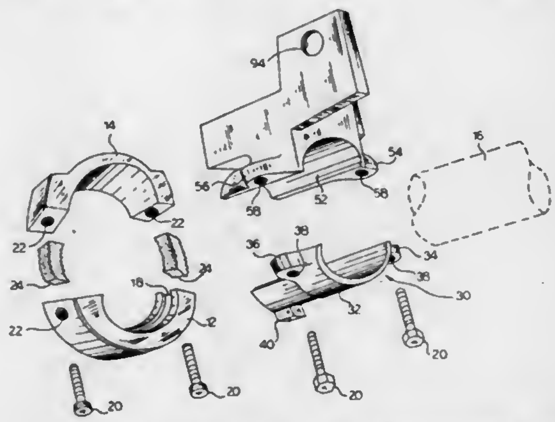
Guy V. O. Bulkeley, Box 67007 Bryanston, Johannesburg, South Africa

Continuation of Ser. No. 999,116, Apr. 1, 1993, abandoned.

This application Oct. 21, 1994, Ser. No. 327,442

Int. Cl.^{6} G05G ***11/00***

U.S. Cl. 74—489 **8 Claims**



1. A combination of a connector and a motorcycle having a hand control lever and a handlebar, wherein the connector comprises:

a. a split mounting bracket having a tubular portion surrounding said handlebar, said control lever attached to the bracket;

b. a pair of complementary circumferential clamping members clamped around said handlebar, at least one of the clamping members having an arcuate internal semi-circular groove;

c. a lug extending radially from one end of said bracket; and

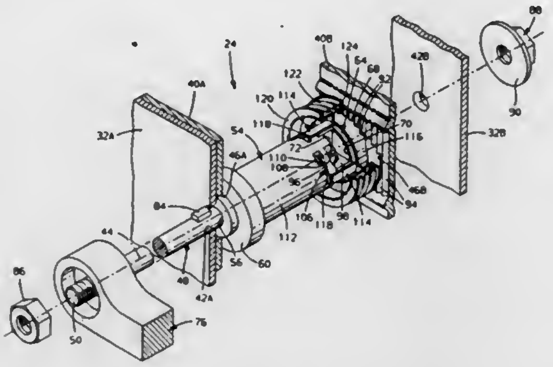
d. at least one spring member placed within said groove between said lug and one end of said groove, where the at least one spring member is compressed when said control lever is rotated about said handlebar under a rotational force, and can return said mounting bracket to its initial position when said control lever is no longer subject to said rotational force.

5,461,937
POSITION CONTROL APPARATUS FOR STEERING COLUMN

William D. Cymbal, Freeland, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 31, 1994, Ser. No. 331,409
Int. Cl.^{6} B62D ***1/18***

U.S. Cl. 74—493 **5 Claims**



1. A position control apparatus for a motor vehicle steering column having a mast jacket movable in the direction of a longitudinal centerline of said steering column through a range of adjusted positions comprising:

a stationary bracket having a stationary leg in a vertical plane adjacent said mast jacket,

a movable bracket attached to said mast jacket having a movable leg in a vertical plane juxtaposed said stationary leg and movable with said mast jacket relative to said stationary leg,

a clamp means on said stationary bracket operative to prevent movement of said mast jacket through said range of adjusted positions when said clamp means is closed and to permit movement of said mast jacket through said range of adjusted positions when said clamp means is open including a first jaw element on a first side of said movable leg and a second jaw element on an opposite second side of said juxtaposed stationary leg,

a control lever pivotable through an angular stroke in an opening direction between an up position and a down position and in an opposite closing direction between said down position and said up position,

a primary cam means connecting said control lever and said first jaw element operative to close said clamp means by moving said first jaw element through an axial stroke toward said second jaw element concurrently and uniformly with pivotal movement of said control lever through said angular stroke thereof in said closing direction, and

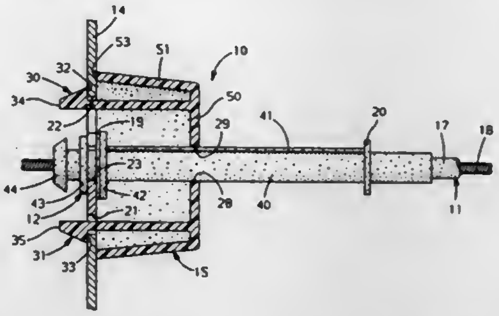
a secondary cam means connecting said control lever and said first jaw element operative to open said clamp means by moving said first jaw element through said axial stroke away from said second jaw element in snap-action fashion at a terminal end said pivotal movement of said control lever through said angular stroke thereof in said opening direction so that said clamp means is not open and said mast jacket is not movable relative to said stationary bracket until said terminal end of said pivotal movement of said control lever in said opening direction.

5,461,938
CONTROL CABLE END CONNECTOR

Thomas H. Froling, Royal Oak; Thomas A. Nistor, Sterling Heights, and Stephen Sigety, Jr., Mt. Clemens, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 8, 1994, Ser. No. 287,546
Int. Cl.^{6} F16C ***1/14;*** **F16G** ***11/00***

U.S. Cl. 74—502.4 **4 Claims**



4. An end connector assembled to a control cable and attachable to a substantially flat portion of a wall that has a keyhole opening and a slot opening comprising:

a connector element including a cylindrical body with first and second ends having first and second annular flanges disposed adjacent to the first end of the cylindrical body, the second annular flange disposed further from the first end of the cylindrical body than the first annular flange and being larger in diameter, the cylindrical body between the first and the second annular flanges being engagable with the keyhole opening so that the wall adjacent to the keyhole opening is captured between the first and the second annular flanges;

a gasket positioned adjacent the second annular flange for engagement with the wall;

a slidable cable extending through the connector element;

a stop disposed near the second end of the cylindrical body;

a radially extending key disposed on the cylindrical body between the second annular flange and the stop; and

an acoustic cup slidably coaxially disposed on the cylindrical body between the second annular flange and the stop having a key way cooperating with the radially extending key to prevent relative rotational movement between the connector element and the acoustic cup, the acoustic cup including two cantilevered legs with hooks for engaging the keyhole opening and the slot opening to releasably attach the acoustic cup to the wall and including an annular edge biased against the wall.

5,461,939
ADJUSTABLE PEDAL EXTENSION

Winfred R. Upton, Los Angeles, Calif., assignor to Jesuit Community at Loyola University, Los Angeles, Calif.

Filed Mar. 29, 1993, Ser. No. 38,536
Int. Cl.^{6} G05G ***1/16;1/14***

U.S. Cl. 74—562.5 **7 Claims**

1. A pedal extension device operable with existing pedals in a vehicle, comprising:

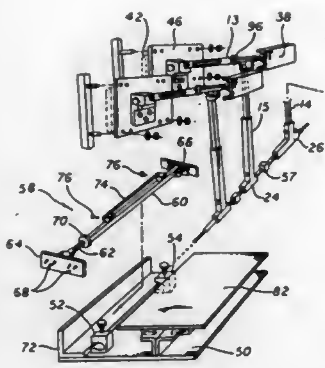
a connector member;

at least one support linkage pivotally coupled to the connector member;

an extension linkage associated with each support linkage and each existing pedal, the extension linkage being pivotally coupled between an associated support linkage and an existing pedal, wherein the extension and support linkages are adjustable in length;

an extension pedal associated with each extension linkage, the extension pedal extending from each extension linkage opposite each associated existing pedal;

a platform assembly including a platform base coupled to the connector member, and



securing means for rigidly fixing the platform base to the floor of the vehicle, wherein the securing means comprises suction means disposed on the bottom of the platform base.

5,461,940
OUTBOARD MOTOR ENGINE

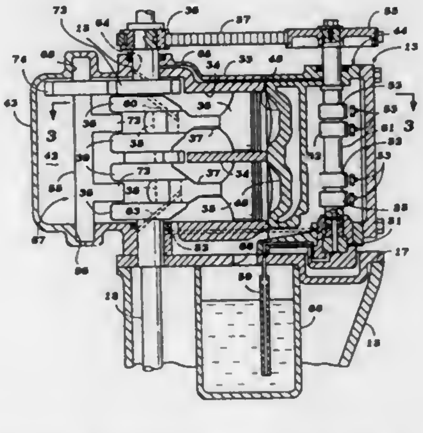
Toshimasa Morita, Hamamatsu, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Filed Oct. 29, 1993, Ser. No. 145,479

Claims priority, application Japan, Jan. 29, 1992, 4-312667

Int. Cl.⁶ F16C *3/04;11/00;* **F02B** *75/06*

U.S. Cl. 74—603 **21 Claims**



1. A balancing arrangement for a reciprocating machine comprised of a cylinder block having at least one cylinder bore in which a piston reciprocates, a crankcase member affixed to said cylinder block and defining with said cylinder block a crankcase chamber in which a crankshaft rotates about a crankshaft axis, a connecting rod connecting said piston to a throw of said crankshaft for transmitting motion therebetween, a balancer shaft journaled for rotation in said crankcase chamber about a balancer shaft axis parallel to and offset from said crankshaft axis and having a balancer mass affixed thereto and disposed axially in alignment with said crankshaft throw, said balancer shaft axis being disposed on the opposite side of a plane containing the crankshaft axis and extending perpendicular to the cylinder bore from the cylinder bore, and means for driving said balancer shaft from said crankshaft.

5,461,941
SELF-LOCKING DIFFERENTIAL GEAR

Alastair J. Young, Kenilworth, United Kingdom, assignor to Automotive Products, plc, Leamington Spa, England

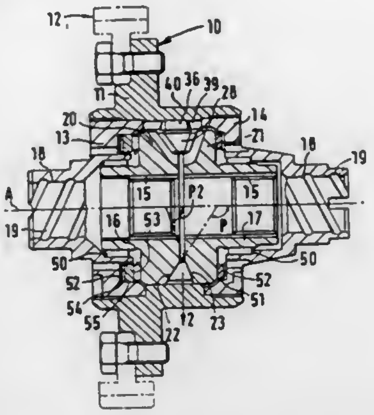
PCT No. PCT/GB93/00555, § 371 Date Dec. 6, 1993, § 102(e) Date Dec. 6, 1993, PCT Pub. No. WO93/21462, PCT Pub. Date Oct. 28, 1993

PCT Filed Mar. 18, 1993, Ser. No. 157,131

Claims priority, application United Kingdom, Apr. 15, 1992, 9208346

Int. Cl.⁶ F16H *35/04*

U.S. Cl. 74—650 **8 Claims**



1. A differential mechanism comprising: two output cam members rotatable about an axis each said member having a single annular cam surface thereon of undulating form comprising pairs of mutually inclined surfaces, one of said cam members having a different number of said pairs of inclined surfaces thereon than the other of said cam members, the cam surfaces on the cam members being frusto conical and converging towards each other, and a plurality of cam followers having end surfaces engaging the cam surfaces of the output cam members, the arrangement being such that relative contra rotation of said output cam members causes the cam followers to slide axially, and an input element engaging the followers which are slidably supported by the input element and moving the followers circumferentially relative to the output cam members, the input element engaging with a radially outer portion of each cam follower to move the follower circumferentially relative to the cam output members, and supporting the two cam output members against axially outward movement during drive of the cam output members through the followers, wherein the output cam member having the higher number of pairs of inclined surfaces thereon frictionally engages the input element with a higher frictional force than the other output cam member in order to reduce the difference between the torque cutout ratio of the output cam members when making a right-hand turn compared with the torque output ratio when making a left-hand turn.

8. A method of altering the torque output ratio of a differential of the type comprising two output cam members rotatable about an axis, each said member having a single annular cam surface thereon of undulating form comprising pairs of mutually inclined surfaces, one of said cam members having a different number of said pairs of inclined surfaces thereon than the other of said cam members, the cam surfaces on the cam members being frusto conical and converging towards each other, and a plurality of cam followers having end surfaces engaging the cam surfaces of the output cam members, the arrangement being such that relative contra rotation of said output cam members causes the cam followers to slide axially, and an input element engaging the followers which are slidably supported by the input element and moving the followers circumferentially relative to the output cam members, the input element engaging with a radially outer portion of each cam follower to move the follower circumferentially relative to the cam output members, and supporting the two cam output members against axially outward movement during drive of the cam output members through the followers, wherein the output cam member having the higher number of pairs of inclined surfaces thereon frictionally engages the input element with a higher frictional force

than the other output cam member in order to reduce the difference between the torque output ratio of the output cam members when making a right-hand turn compared with the torque output ratio when making a left-hand turn, said method comprising: causing the output cam member having the higher number of pairs of inclined surfaces thereon, to frictionally engage the input element with a higher frictional force than the other output cam member in order to reduce the difference between the torque output ratio of the output cam members when making a right hand turn.

5,461,942

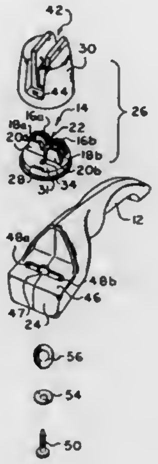
KNIFE SHARPENER

Andrew T. Kelley, Buffalo, N.Y., assignor to Cutco Cutlery Corporation, Olean, N.Y.

Filed Oct. 28, 1994, Ser. No. 330,546

Int. Cl.^{6} B21K *5/12*

U.S. Cl. 73—87 **9 Claims**



1. A knife sharpener comprising:
an elongated handle; and
a blade sharpening unit including abrasive blade sharpening means, said abrasive blade sharpening means defining a generally transversely extending blade draw channel having only one predetermined blade draw direction;
said sharpening unit being mounted at a distal end of said handle for rotation relative to said handle between first and second secured positions to change the orientation of said blade draw direction relative to said handle;
whereby said blade draw direction may be selectively oriented to accommodate a right-handed or a left-handed user of said knife sharpener.

5,461,943

CABINET SCRAPER BLADE FILING AND BURNISHING TOOL

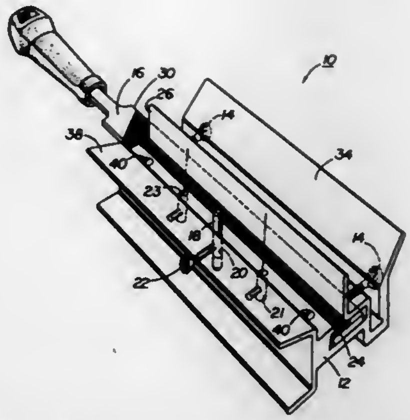
Kenneth J. Munkel, Des Moines, Iowa, assignor to Woodsmith Corporation, Des Moines, Iowa

Filed Oct. 8, 1993, Ser. No. 134,205

Int. Cl.^{6} B24D *15/06*

U.S. Cl. 76—89.2 **17 Claims**

1. A cabinet scraper blade edge preparation tool comprising:
(a) means for abrading the edge of the scraper blade;
(b) means for burnishing the blade edge of the scraper blade, wherein the burnishing means comprises a burnishing rod;
(c) first means for supporting the blade edge of the scraper blade at a fixed and acute burnishing angle relative to the burnishing means, wherein the first means comprises means for alternatively holding the burnishing rod in a variety of relationships to a burnishing fence that supports the scraper blade; and



(d) second means for supporting the edge of the scraper blade at a fixed abrading angle relative to the abrading means.

5,461,944

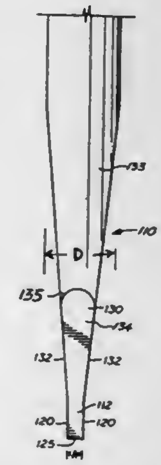
METHOD OF MAKING A SCREWDRIVER

Massimo Clumaga, P.O. Box 57028, Oklahoma, Okla. 73107

Continuation-in-part of Ser. No. 54,405, Apr. 28, 1993, abandoned, which is a continuation-in-part of Ser. No. 905,163, Jun. 25, 1992, abandoned, which is a continuation of Ser. No. 392,822, Aug. 11, 1989, which is a continuation-in-part of Ser. No. 944,470, Dec. 8, 1986, Pat. No. 4,873,900. This application Jun. 17, 1994, Ser. No. 261,415

Int. Cl.^{6} B25B *13/48*

U.S. Cl. 76—119 **10 Claims**



1. A method of making a screwdriver, the screwdriver comprising:
(a) a shank having a longitudinal axis;
(b) a bit of rectangular cross section formed at an end of the shank,
  (i) the bit having first and second pairs of opposing surfaces and first and second ends,
  (ii) the first pair of opposing surfaces of the bit being parallel to each other, parallel to the longitudinal axis of the shank and, when the bit is inserted into a screw slot, parallel to the longitudinal axis of the screw slot;
(c) a handle for applying torque to the shank; and
(d) a blade of rectangular cross section formed onto the end of the shank, upon which the bit is formed, wherein:
  (i) two opposing surfaces of the blade taper inwardly to the bit,
  (ii) the cross-sectional area of the bit at the point at which the blade meets the bit is substantially equal to the cross-sectional area of the blade at that point,
  (iii) the blade has first and second ends, the second end of the blade being connected to the first end of the bit,

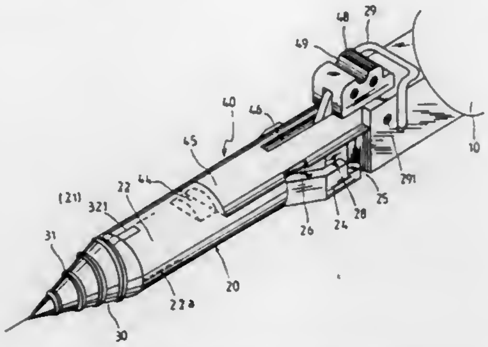
- (iv) the cross-sectional area of the second end of the blade is substantially equal to the cross-sectional area of the first end of the bit,

the method comprising the steps of:

- (1) forming a piece of metal into the shank, the blade, and the bit;
- (2) attaching the handle to the shank after the piece of metal is formed into the shank, the blade, and the bit.

5,461,945
TIRE PUNCTURE REPAIR DEVICE

Meng-Chang Lee, Suite 1, 11F. No. 95-8 Chang Ping Rd. Sec. 1, Taichung, Taiwan, Prov. of China
Filed May 5, 1994, Ser. No. 238,328
Int. Cl.^{6} B29C *73/08*
U.S. Cl. 81—15.7 **5 Claims**

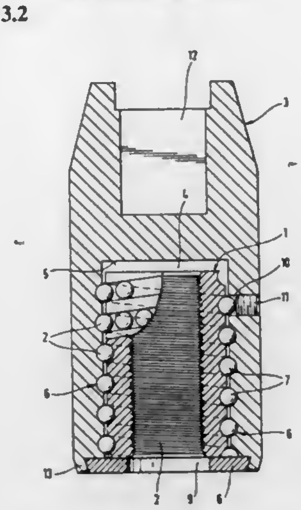


1. A tire puncture repair device for inserting a resilient elongate obturating member of predetermined length through a puncture in a tire, said tire puncture repair device comprising:

- a handle member;
- an elongate shank member fixed on a rear end thereof to said handle member, said shank member having a central bore in a cylindrical fore end portion thereof, and at least one axially aligned first coupling surface extending from the fore end thereof;
- a generally conical penetrater member having a helical thread formed therearound for boring through a tire puncture, said penetrater member having an eyelet below a base thereof and at least one axially aligned second coupling surface for engagement with corresponding at least one axially aligned first coupling surface on said shank member, wherein said obturating member is inserted through the eyelet and folded thereabout, after which the folded said obturating member is inserted into the bore of said shank member until said penetrater member is brought into abutment with the fore end of said shank member with the second coupling surface thereon slidingly engaging the first coupling surface of said shank member to rotatingly couple said penetrater member therewith,
- a securing means for releasably securing a portion of either end of the folded said obturating member to medial positions between the fore end of said shank member and said handle member after insertion of said obturating member into the bore of said shank member, whereat said obturating member is under tension and biases said penetrater member against the fore end of said shank member; and
- a bolt member engageable with said penetrater member through the bore of said shank member for urging said penetrater member away from the fore end of said shank member so as to have a predetermined separation therefrom after penetration of a wall of a tire, whereat the displaced said penetrater member carries a bight of said obturating member out from the bore of said shank member with a sufficient length of the folded said obturating member remaining in the bore, subsequent extraction of said shank member from the tire puncture after first disengaging said securing means concomitantly effects the extrusion of said obturating member from the bore of said shank member so as to obturate the tire puncture.

5,461,946
SETTING TOOL FOR THREADED RODS

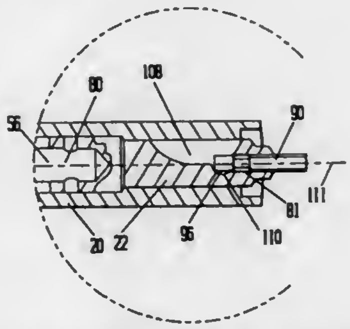
Hubert Nutt, Mauren, Liechtenstein, assignor to Hilti Aktiengesellschaft, Fürstentum, Liechtenstein
Filed Nov. 2, 1994, Ser. No. 333,383
Claims priority, application Germany, Nov. 2, 1993, 43 37 328.3
Int. Cl.^{6} B25B *13/50*
U.S. Cl. 81—53.2 **6 Claims**



1. Setting tool for screwing threaded rods into a base material comprising a receiving member (1) with a threaded bore (2) extending axially therethrough and arranged to receive one of the threaded rods, an entrainment member (3) for transmitting a rotary motion to the receiving member (1), said receiving member (1) is located at least partially in a blind bore (4) in said entrainment member (3), and a stop located within said blind bore (4) for limiting the depth of penetration of the threaded rods into the blind bore (4), wherein the improvement comprises a ball thread spindle (6) having least one thread turn provided between said entrainment member (3) and said receiving member (1) where said ball thread spindle (6) and the thread of the threaded bore (2) have the same rotational direction.

5,461,947
TOOL HOLDER WITH EJECTION SLOT

Ronald W. Batten, 5618 White Ct., Torrance, Calif. 90501
Continuation-in-part of Ser. No. 4,286, Jan. 14, 1993, abandoned. This application Jul. 22, 1994, Ser. No. 279,183
Int. Cl.^{6} B25B *17/00*
U.S. Cl. 81—56 **15 Claims**



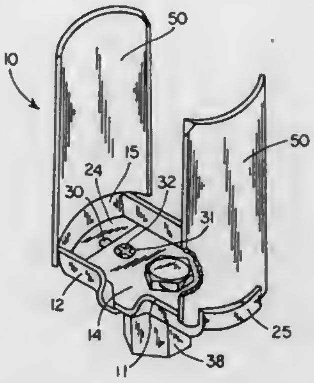
1. In a holder for a tool element which has a tool receptacle extending from one end thereof and an interior end within said

holder for the removable reception of a tool within said receptacle, the improvement which comprises an elongated blind slot extending axially along the length of said holder with a depth to about the centerline of said holder and an arcuate bottom, and intersecting said receptacle adjacent its interior end, to expose the received end of said tool, whereby an element can be inserted into said slot into contact with said received end of said tool and moved axially along said holder for forced ejection of said tool from said receptacle.

5,461,948

SOCKET TYPE TOOL FOR REMOVING OIL FILTER CARTRIDGE

Thomas Perrero, Jr., 6375 Glenoaks St., Murray, Utah 84107
Continuation of Ser. No. 935,902, Aug. 27, 1992, abandoned.
This application Oct. 6, 1993, Ser. No. 132,573
Int. Cl.^{6} B25B *13/18*
U.S. Cl. 81—128 **8 Claims**



1. An improvement in a tool for removing an oil filter cartridge from its mounting on an internal combustion engine, said tool being of the type having

- an upper base member of generally rectangular configuration and including a flat base portion having inner and outer ends;
- a lower base member of generally rectangular configuration and including a flat base portion having inner and outer ends;
- means for interconnecting said upper and lower base members for limited linear relative sliding movement over one another, with the outer ends of said upper and lower base members being positioned at opposite outer ends of the interconnected upper and lower base members;
- a circular opening in said lower member;
- a slot in said upper member, said slot being elongated in a direction transverse of the upper member and overlying said circular opening in said lower member;
- a nut having a cylindrical peripheral portion rotatably disposed in said circular opening in said lower member; and
- a cam member eccentrically located on said nut and extending into the transverse slot in said upper base member for moving said upper base member outwardly and inwardly relative to said lower base member upon rotation of said nut,

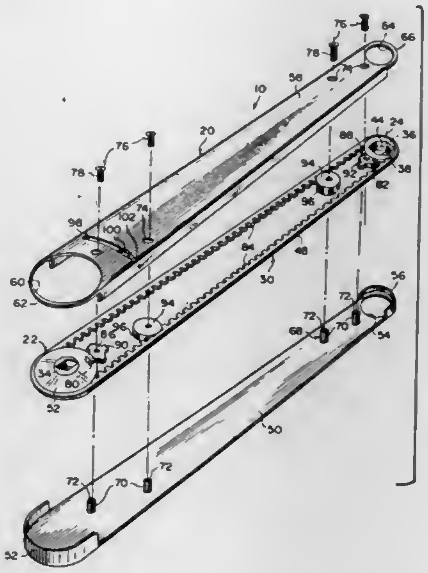
said improvement comprising

- a pair of elongate sidewalls, with each of said elongate sidewalls having a curved inner surface that matches the cylindrical surface of an oil filter cartridge, and further with each of said elongate sidewalls extending upwardly from an outer end of a respective upper and lower base member, wherein said elongate sidewalls have a length sufficient that when the tool is received over a distal end of an oil filter cartridge, the distal ends of the sidewalls extend to a position adjacent to a base of the oil filter cartridge; and
- said elongate sidewalls slant toward each other so that the internal surfaces of the sidewalls make an included angle with the flat base portions of the respective upper and lower base members of between about 84 and 87 degrees, so that when the tool is received over an oil filter cartridge and the nut is rotated to move the upper base member inwardly relative to said lower base member and thereby draw the sidewalls toward each other, the distal ends of the sidewalls make initial, primary engagement with the base of the oil filter cartridge and then the inside surfaces of the elongate sidewalls make secondary engagement with the sidewall of the oil filter cartridge.

5,461,949

RATCHET TRANSFER DEVICE

Paul J. Carver, P.O. Box 22101, Lincoln, Nebr. 68542-2101
Filed Mar. 28, 1994, Ser. No. 218,429
Int. Cl.^{6} B25B *17/00*
U.S. Cl. 81—57.3 **3 Claims**



1. A ratchet transfer device for a reversible ratchet handle of a socket wrench set, the handle having a drive end with a ratchet reverse lever and a square peg, said device comprising:

- a) an elongated generally flat narrow casing;
- b) means at a first end of said casing, for rotatively coupling the square peg of the reversible ratchet handle, said rotatively coupling means being a drive pulley turret having a square receptacle therein to receive the square peg of the reversible ratchet handle;
- c) means at a second end of said casing for rotatively engaging a hard to get at hidden hex nut/hex bolt head in a work piece, said rotatively engaging means including a driven pulley box head having a hex opening therethrough, a hex shaped socket adaptor to fit into said hex opening of said driven pulley box head, said hex shaped socket adaptor having a hex bore to receive the hex nut/hex bolt head in the work piece, and a spring-loaded bearing in said hex opening of said driven pulley box head, to lock into a depression on one side of said socket adaptor in a releasable manner, whereby a plurality of said socket adaptors with different sized said hex bores can be interchangeable with said driven pulley box head to fit onto different sized hex nuts/hex bolt heads;
- d) means within said casing for transmitting down its length the action of the square peg of the reversible ratchet handle in said rotatively coupling means to said rotatively engaging means to turn the hex nut/hex bolt head in the work piece, said transmitting means being a continuous belt within said casing between said drive pulley turret and said driven pulley box head, said casing including a lower portion having a first closed end and an aperture at a second end to expose said driven pulley box head therein, an upper portion having a first aperture at a first end to expose said drive pulley turret therein and a second aperture at a second end to expose said driven

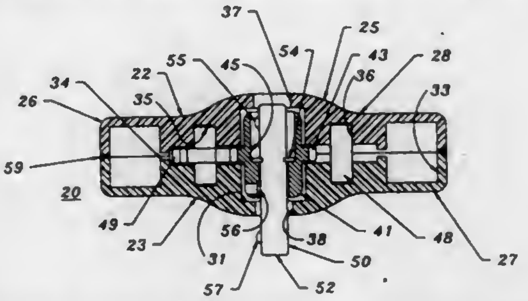
pulley box head, and means for securing said lower portion to said upper portion together, said securing means including said lower portion having a plurality of upstanding spaced apart spindle shanks, with each said spindle shank having a longitudinal threaded bore therein, said upper portion having a plurality of spaced apart holes, with each said hole being in alignment with one said spindle shank, and a plurality of fasteners, with each said fastener to extend through one said hole and screw into said threaded bore in one said spindle shank, so as to secure said upper portion to said lower portion of said casing, each said fastener being a screw, said drive pulley turret having a plurality of cavities radially positioned about the circumference, said driven pulley box head having a plurality of cavities radially positioned about the circumference, and said continuous belt having a plurality of teeth to fit into said cavities of said drive pulley turret and said cavities of said driven pulley box head;

e) a pair of gears having a plurality of teeth and rotatable on two said spindle shanks, in which said teeth of said first gear engages with said cavities of said drive pulley turret, while said teeth of said second gear engages with said cavities of said driven pulley box head independently of said teeth on said continuous belt for stabilizing said drive pulley turret and said driven pulley box head within said casing.

5,461,950
T-SHAPED REVERSIBLE RATCHET TOOL

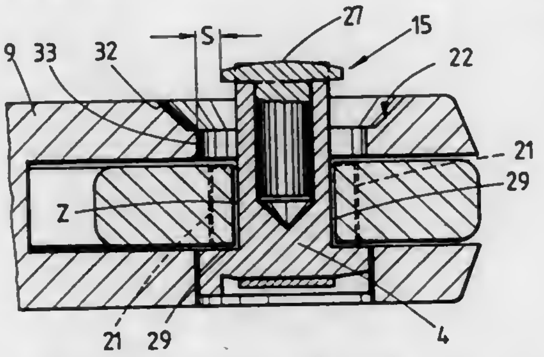
Dean J. Iwinski, Muskego, Wis., assignor to Snap-on Incorporated, Kenosha, Wis.
Filed Apr. 25, 1994, Ser. No. 232,607
Int. Cl.^{6} B25B *13/46*
U.S. Cl. 81—61 **4 Claims**

1. A ratchet tool comprising: an oblong handle housing, a ratchet mechanism disposed in said housing for rotation relative to said housing in only one direction about an axis, said ratchet mechanism having an axial passage polygonal in transverse cross section extending therethrough between opposite ends thereof, said housing having openings therein coaxial with said passage respectively at said opposite ends, ratchet detent structure formed on said ratchet mechanism, a shaft matingly engaged in said passage for rotation with said ratchet mechanism and for axial movement relative to said housing between first and second use conditions, first and second and third shaft detent structures formed on said shaft at longitudinally spaced-apart locations, and retaining means carried by said shaft and engageable with said ratchet mechanism and said handle housing respectively in the first and second use conditions of said shaft for limiting axial movement of said shaft and preventing removal thereof from said passage, said shaft in its first use condition projecting from one of said openings with said first shaft detent structure disposed outwardly of said housing for engagement with an associated driven member and with said second shaft detent structure disposed in engagement with said ratchet detent structure for holding said shaft in its first use condition, said shaft in its second use condition projecting from the other of said openings with said third shaft detent structure disposed outwardly of said housing for engagement with an associated driven member and with said first shaft detent structure disposed in engagement with said ratchet detent structure for holding said shaft in its second use condition.



5,461,951
PLIERS WITH TWO PLIER ARMS

Ralf Putsch, Wuppertal, Germany, assignor to KNIPEX-Werk C. Gustav Putsch, Wuppertal, Germany
Continuation of Ser. No. 922,045, Jul. 29, 1992, abandoned. This application Jan. 7, 1994, Ser. No. 178,585
Claims priority, application Germany, Aug. 8, 1991, 9109830 U; Nov. 7, 1991, 9113870 U
Int. Cl.^{6} B25B *7/04*
U.S. Cl. 81—412 **21 Claims**



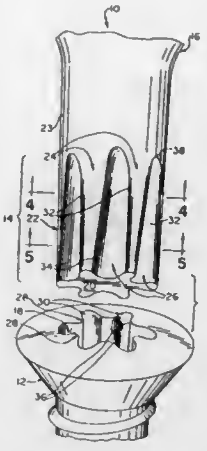
1. In a pliers having a pivot pin, and first and second plier arms which intersect in a region of intersection and are connected to each other by means of the pivot pin in the region of intersection, the arms having plier jaws respectively above the region of intersection and having grip sections below the region of intersection, wherein said first plier arm is displaceable stepwise relative to said second plier arm in said region of intersection in order to change the spacing of the plier jaws with respect to each other, the first plier arm passing through a free space in said second plier arm, said pivot pin is guided in fitted manner in a hole in said second plier arm and is displaceable transverse to a longitudinal plane of the pliers, said longitudinal plane extending through both said plier arms, said first plier arm in said region of intersection is formed with a longitudinal slot with profiled flanks, said pivot pin has two adjacent cross-sectional regions in axial direction of the pivot pin, a first of said cross-sectional regions being in form-locked engagement with said profiled flanks of said slot in a coupled condition of said first and second plier arms, and a second of said cross-sectional regions is a thinner cross-sectional region and is freely displaceable in the slot in a releasable uncoupled condition of said first and second plier arms, the improvement comprising

means comprising a detent part which acts substantially perpendicular to its direction of displacement for adjustably locking the pivot pin.

5,461,952
BACK-SIDE TAPER WEDGING DRIVE SYSTEM

David Goss, Rockford, Ill., assignor to Textron Inc., Providence, R.I.
Continuation of Ser. No. 883,133, May 14, 1992, Pat. No. 5,291,811. This application Oct. 1, 1993, Ser. No. 130,371
Int. Cl.^{6} B25B *15/00*
U.S. Cl. 81—460 **5 Claims**

1. A drive system for driving fasteners into a workpiece comprising: a multilobular driving portion for engagement with a complementary multilobular driven portion; the driving portion



and the driven portion each including alternating flutes and lobes and a central axis extending longitudinally therethrough; each lobe having a drive wall and a trailing wall; each of said lobes abutting a flute; each of said drive walls having a planar face portion disposed generally parallel to said central axis for facilitating torque transfer from the driving portion to the driven portion and said trailing walls; and at least one of said trailing walls being tapered relative to the corresponding driving wall contacting an abutting lobe in wedging engagement when the driving portion is engaged with the driven portion.

5,461,953

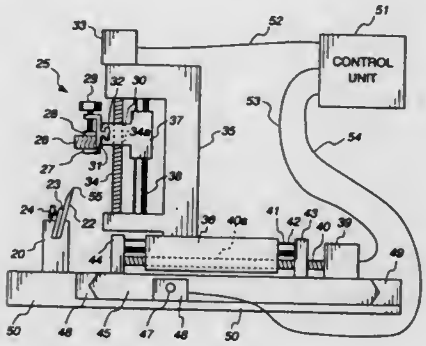
MULTI-DIMENSION MICROTOME SECTIONING DEVICE

James B. McCormick, 6755 Longmeadow Dr., Lincolnwood, Ill. 60646

Filed Mar. 25, 1994, Ser. No. 217,957

Int. Cl.^{6} G01N *1/06*

U.S. Cl. 83—36 **26 Claims**



1. A method for generating parallel tissue ribbons from an organic tissue specimen comprising:

(a) providing a base;

(b) providing a cutting blade mounted on the base for cutting sections from the tissue specimen;

(c) providing a tissue specimen holder mounted on the base for holding a tissue specimen;

(d) shifting the tissue holder relative to the cutting blade in a first direction to cause the cutting of a first tissue section from the tissue specimen at a first cutting location;

(e) shifting the specimen holder relative to the cutting blade in a second direction perpendicular to the first direction to present a second section of the tissue specimen for cutting at a second cutting location spaced in the second direction from the first cutting location to cut a second tissue section; and

(f) shifting the tissue specimen in a third direction to bring the tissue specimen over the cutting blade to cut an additional tissue section joined to the first tissue section to form a first tissue ribbon with multiple tissue ribbon sections and to bring the tissue specimen to cut an additional tissue section joined to the second tissue section to form a second tissue ribbon.

5,461,954

METHOD AND DEVICE FOR FEEDING PORTIONS OF WRAPPING MATERIAL TO A PACKING LINE

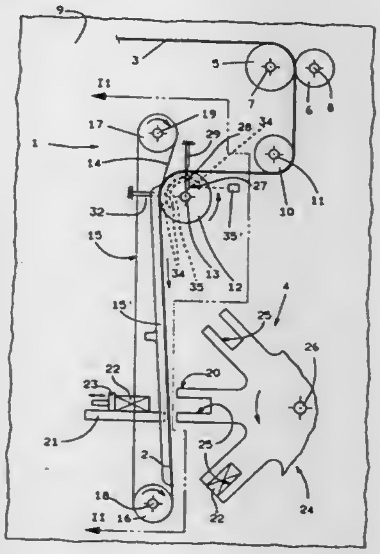
Silvano Boriani, and Alessandro Minarelli, both of Bologna, Italy, assignors to G.D Societa' Per Azioni, Bologna, Italy

Filed Jun. 6, 1994, Ser. No. 254,130

Claims priority, application Italy, Jun. 18, 1993, BO93A0276

Int. Cl.^{6} B65B *41/00;11/00;* **B26D** *3/08;3/12*

U.S. Cl. 83—49 **7 Claims**



1. A method for feeding portions (2) of wrapping material to a packing line wherein said portions (2) are cut successively off a continuous strip (3) of wrapping material, said method, for each said portion (2), comprising the steps of:

providing said strip (3) to a strip conveying means (12), said strip conveying means (12) supporting a movable cutting means (28);

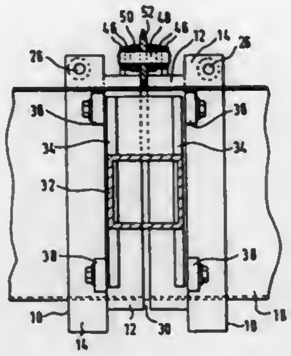
making at least one first partial transverse cut (31) in said strip (3) by means of a first fixed cutting means (29) cooperating with said movable cutting means (28), said at least one first partial transverse cut (31) initiating detachment of said portion (2);

making at least one second partial transverse cut (33) in said strip (3) by means of a second fixed cutting means (32) cooperating with said movable cutting means (28), said at least one second partial transverse cut (33) being aligned longitudinally with said at least one first partial transverse cut (31), said at least one second partial transverse cut (33) completing detachment of said portion (2); and

drawing said strip (3) from said strip conveying means (12), in the course of making said at least one second partial transverse cut (33), by feed means (15) not involving the strip portion in which said at least one second partial transverse cut (33) is to be made.

5,461,955
DEVICE FOR CUTTING PIPE

Erhard Weisshaar, Erlenweg 2, D - 7712 Blumberg 3, Germany
Filed Nov. 16, 1992, Ser. No. 976,202
Claims priority, application Germany, Nov. 16, 1991, 41 37 808.3
Int. Cl.^{6} B26D *3/16;* **B23D** *21/06*
U.S. Cl. 83—54 **10 Claims**

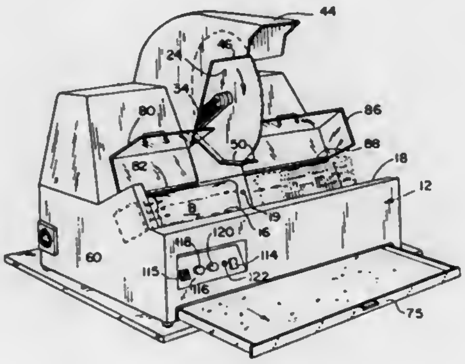


1. A method for cutting cylindrical pipe, said method comprising
(a) placing securely about said pipe a device for cutting pipe, said device comprising:
  a cutting tool, said cutting tool being a chain-type pipe cutter including a link chain and cutting disks rotatably secured to said link chain, and means to tensionably couple said link chain to the pipe to be cut;
  a first sleeve having a radially interior surface tensionably fastenable about the pipe at a position adjacent to a circumferential line on the pipe to be cut; and
  a second sleeve having a radially interior surface tensionably fastenable about the pipe at a position adjacent to a circumferential line on the pipe to be cut to thereby enclose the pipe in a manner leaving exposed the circumferential line with an axial separation between said first sleeve and said second sleeve, said first and second sleeves having radially exterior surfaces for positioning the cutting tool and guiding its movement during the cutting of the pipe
wherein said first and said second sleeves are each comprised of (i) an axially interior pipe reinforcing cuff part of lesser wall thickness and (ii) an axially exterior flange part of greater radial wall thickness,
and further including guide rollers rotatably secured to the chain links of the pipe cutter coaxially with the cutting disks, said guide rollers having a smaller diameter than the cutting disks and adapted to rest upon the exterior surface of the pipe reinforcing cuff part during cutting of the pipe to serve as spacers to delimit the cutting depth;
(b) tensioning said tensioning means to tensionably secure said link chain and cutting disks to the pipe to be cut; and
(c) rotating said cutting tool to cause said cutting disks to cut said cylindrical pipe.

2. A device for cutting cylindrical pipe, said device comprising:
a cutting tool, said cutting tool being a chain-type pipe cutter including a link chain and cutting disks rotatably secured to said link chain, and means to tensionably couple said link chain to the pipe to be cut;
a first sleeve having a radially interior surface tensionably fastenable about the cylindrical pipe at a position adjacent to a circumferential line on the pipe to be cut; and
a second sleeve having a radially interior surface tensionably fastenable about the cylindrical pipe at a position adjacent to a circumferential line on the pipe to be cut to thereby enclose the pipe in a manner leaving exposed the circumferential line with an axial separation between said first sleeve and said second sleeve, said first and second sleeves having radially exterior surfaces for positioning the cutting tool and guiding its movement during the cutting of the pipe
wherein said first and said second sleeves are each comprised of (a) an axially interior pipe reinforcing cuff part of lesser wall thickness and (b) an axially exterior flange part of greater radial wall thickness,
and further including guide rollers rotatably secured to the chain links of the pipe cutter coaxially with the cutting disks, said guide rollers having a smaller diameter than the cutting disks and adapted to rest upon the exterior surface of the pipe reinforcing cuff part during cutting of the pipe to serve as spacers to delimit the cutting depth.

5,461,956
VARIABLE THICKNESS BREAD SLICER

Bernard L. Petersen, Marne; Alan M. Ledford, Coopersville, and Gary L. Kruse, Spring Lake, all of Mich., assignors to Oliver Products Company, Grand Rapids, Mich.
Filed Jan. 27, 1993, Ser. No. 9,865
Int. Cl.^{6} B26D *1/16;5/20*
U.S. Cl. 83—221 **11 Claims**



1. A variable thickness bread slicing machine that is capable of slicing both crusty and soft breads comprising:
a support surface for a loaf of bread, including an infeed table and an outfeed table;
a circular rotational bread slicing knife;
a support arm rotationally supporting said slicing knife and shiftable to advance said knife from a non-slicing retracted position to a slicing position between, and transverse to, said infeed and outfeed tables, and to return said knife to said retracted position away from said tables and any bread thereon:
arm shifting motor means operably connected to said support arm for shifting said support arm and thereby said knife between said slicing position and said retracted position;
a drive motor that rotationally drives said knife through multiple revolutions during said shifting:
a step-by-step bread pusher shiftable along said infeed table in intermittent increments toward said slicing knife, to advance the bread in intermittent incremental steps of preselected dimension:
a user bread thickness selection device and a control responsive to said selection device to vary the dimension of said increments according to a selected thickness value; and
control means for said pusher adjacent said knife and positioned to be actuated when said pusher approaches said knife, and operably connected to said arm shifting motor means to restrain said knife in said retracted position while said pusher travels momentarily past said knife to said outfeed table to push the fully sliced bread loaf completely onto said outfeed table, and subsequently return to said infeed table.

5,461,957

COLD MEAT SLICER

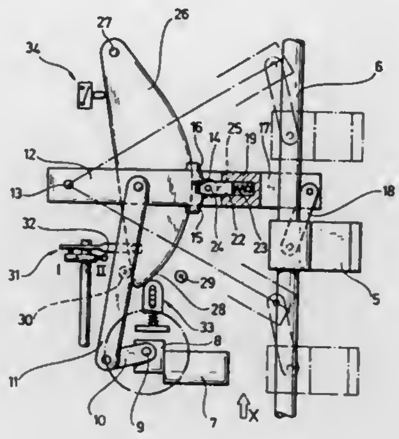
Klaus Koch, Geislingen; Michael Fuchs, Esslingen, and Viktor Fecker, Hechingen, all of, Germany, assignors to Bizerba-Werke Wilhelm Kraut GmbH & Co. KG, Balingen, Germany

Filed Oct. 19, 1993, Ser. No. 122,584

Claims priority, application Germany, Apr. 10, 1991, 41 11 498.8

Int. Cl.⁶ B26D ***7/06***

U.S. Cl. 83—713 **7 Claims**



1. A cold meat slicer including in combination a machine housing (2, 4), a rotating cutter blade (K), a carriage (3) for the product to be cut, means mounting said carriage on said housing for reciprocating movement relative to said cutter blade, said carriage adapted to be driven alternatively manually or by a motor, a motor (7) for driving said carriage and adjusting means for selectively switching between manual and motor-driven operation modes of said carriage, said selecting means comprising a drive rocker arm (12) and a driven rocker arm (17) parallel to said drive rocker arm (12), means mounting said rocker arms for pivotal movement around a common swivel axis (13), said rocker arms executing their movements exclusively in planes parallel to each other, said carriage having a guide member (5), a first coupler (18) for connecting said driven arm (17) to said guide member (5), a crank (10) and a second coupler (11) connecting said drive arm (12) to said motor (7), and a coupling means operable by said adjusting means (31) for coupling and uncoupling said rocker arms to switch over between motor-driven and manual operation of said carriage, said coupling means comprising a recess (14) in and end face of the drive arm (12) remote from said swivel axis (13), a locking element (22) displaceable relative to said recess and engageable therein with surface contact and without relative movement in the engaged position thereof, a guide (19) on said driven arm (17) receiving said locking element for displacement radially of said swivel axis (13) and in the planes of movement of the rocker arms between limits (20, 21), said adjusting means comprising a cam segment (26), said coupling means further comprising a roller (25) attached to said locking element (22) and running along said cam segment, a spring (23) for urging said locking element (22) in the direction toward said swivel axis (13) against one of said limits (21), said locking element (22) and said recess (14) being conical at their flanks so that the force of said spring (23) acting on said locking element is sufficient to prevent accidental release, and at least one electrical switch position indicator associated with said adjusting means to provide an indication of the mode of operation of the carriage.

5,461,958

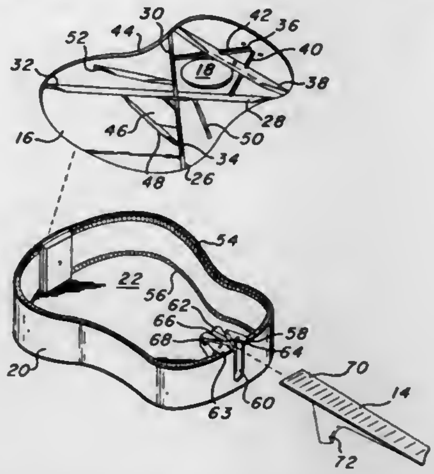
ACOUSTIC GUITAR ASSEMBLY

Michael M. Dresdner, Easton, and Robert K. Headman, Coopersburg, both of Pa., assignors to C. F. Martin & Company, Inc., Pa.

Continuation of Ser. No. 166,231, Dec. 10, 1993, abandoned. This application Jan. 6, 1995, Ser. No. 369,504

Int. Cl.⁶ G10D ***1/08***

U.S. Cl. 84—267 **13 Claims**



1. In an acoustic guitar having a body with a soundboard having a soundhole, a backboard spaced from said soundboard, a sidewall extending around and connecting the soundboard and backboard, and a neck extending from the body sidewall; the improvement comprising: means for bracing the soundboard adjacent to the soundhole for resisting undesirable flexure of the soundboard when the guitar is strung, said bracing means including a pair of bracing strips mounted along their entire lengths on the underside of the soundboard and extending along opposite sides of the soundhole and converging toward the guitar neck having a headblock with a buttress extending into the guitar body below the neck, said buttress having a top surface adjacent said soundboard, said top surface having a pair of converging channels open upwardly toward said soundboard for receiving said pair of bracing strips, whereby the soundboard is stiffened in cantilever fashion in a manner which resists failure in the region of the soundhole without effecting adversely the tonal qualities of the guitar.

5,461,959

MEMBRANOPHONE AND DAMPING MEMBER FOR A MEMBRANOPHONE

Werner Sassmannshausen, Bad Berleburg-Wingeshausen; Karl-Heinz Menzel, Bad Berleburg-Aue; Werner Sassmannshausen, Bad Berleburg-Berghausen; Stefan Schreiber, Köln; Anke Kleindienst, Bad Berleburg, and Hubert Günther, Köln, all of, Germany, assignors to SONOR Johs. Link GmbH, Bad Berleburg, Germany

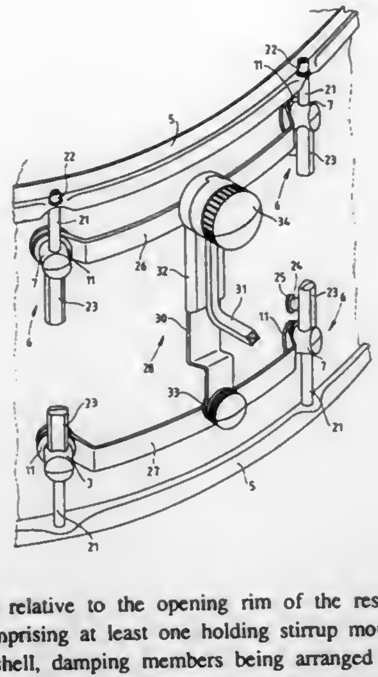
Filed Jan. 24, 1994, Ser. No. 185,659

Claims priority, application Germany, Jan. 27, 1993, 43 02 134.4

Int. Cl.⁶ G10D ***13/02***

U.S. Cl. 84—421 **14 Claims**

1. A membranophone comprising a resonator shell having an outer circumference and opening rims, a principal skin and a secondary skin at the opening rims, a skin tightening and tuning device, the skin tightening and tuning device including rod-shaped tightening elements at least for the principal skin, the tightening elements being arranged uniformly distributed over the outer circumference of the resonator shell, further comprising support members fastened to the resonator shell for supporting the tightening elements, threaded members being engaged with said tightening elements and being mounted between the tightening elements and at least the principal skin, so that the skin is adjustably



tightenable relative to the opening rim of the resonator shell, further comprising at least one holding stirrup mounted on the resonator shell, damping members being arranged between the support members and the resonator shell, the holding stirrup being mounted on the damping members.

5,461,960

DISPENSER

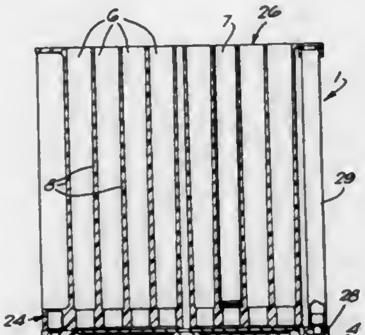
John W. G. Marks, Haslemere, and Simon J. Yates, Portsmouth, both of, United Kingdom, assignors to Chemring Limited, Portsmouth, United Kingdom

Filed Jan. 21, 1994, Ser. No. 184,688

Claims priority, application United Kingdom, Jan. 23, 1993, 9301321

Int. Cl.⁶ F41F *3/065;7/00*

U.S. Cl. 89—1.51 **17 Claims**



1. A dispenser for dispensing payloads and for connection to an aircraft including sequencer means having a plurality of firing contacts and being designed to fire the payloads in a predetermined sequence, the dispenser comprising a main body subdivided into a plurality of cells for receiving said payloads, the improvement comprising the dispenser further including an interface member for interposition between the sequencer means on an aircraft and the main body whereby firing contacts of the sequencer means may be matched to the plurality of the payloads of the dispenser, and wherein, in use, the payloads are received directly by the main body whereby the main body may be disposable.

5,461,961

COMBAT VEHICLE AND SYSTEM FOR TRANSPORTING IT FOR LOADING ONTO AIRCRAFT

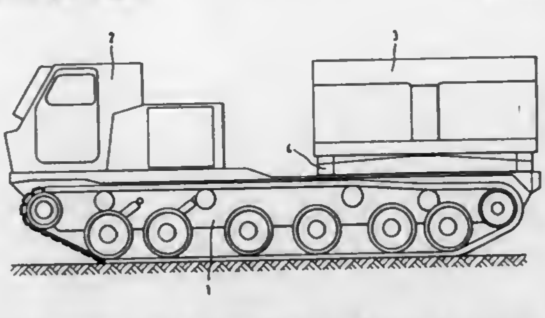
Rüdiger Baus, Vellmar, and Reiner Linge, Kassel, both of, Germany, assignors to Firma Wegmann & Co. GmbH, Kassel, Germany

Filed Dec. 21, 1994, Ser. No. 361,267

Claims priority, application Germany, Jan. 20, 1994, 44 01 587.9

Int. Cl.⁶ F41F *3/04;* **F41A** *23/34*

U.S. Cl. 89—1.815 **8 Claims**



1. A combat vehicle comprising: a chassis; a driver's cab mounted on the chassis; a weapon incorporating a rocket launcher; means mounting the rocket launcher on the chassis comprising a carriage on which the rocket launcher rests, electrically powered mechanisms between the rocket launcher and the carriage for elevating and leveling the rocket launcher and an intermediate structure that rotates on a collar on the chassis and on which the carriage is mounted for pivotal movement in azimuth, wherein the weapon is an independent assembly incorporating the rocket launcher, the carriage, the intermediate structure, and the collar and wherein the weapon is attached to the chassis only by a mount, and optionally by electrical connections accessible from outside the vehicle.

5,461,962

GUN SILENCER ARRANGEMENT

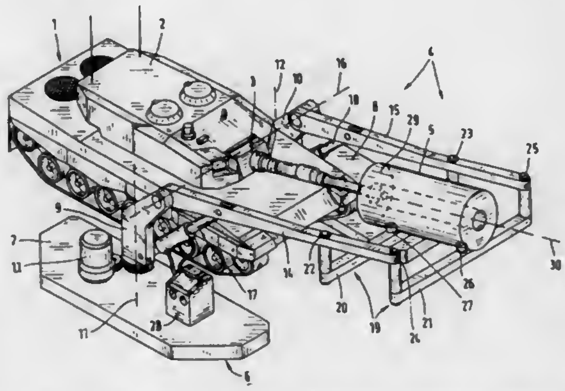
Herbert Krumm, Kaarst, and Karl Wiemers, Bochum, both of, Germany, assignors to Rheinmetall GmbH, Ratigen, Germany

Filed May 27, 1994, Ser. No. 250,844

Claims priority, application Germany, May 27, 1993, 43 17 673.9

Int. Cl.⁶ F41A *21/30*

U.S. Cl. 89—14.4 **9 Claims**



1. A silencer arrangement for a gun including at least one silencer for enclosing a muzzle end of a gun barrel, and a silencer gun carriage which is mechanically decoupled from the gun, with said silencer gun carriage comprising:

two mounting columns which are arranged vertically parallel to one another, and whose distance from one another is greater than the width of the gun mount which is to be arranged between said columns and whose gun is to be provided with said silencer, said mounting columns being mounted for pivotal movement about their respective vertical longitudinal axes;

a respective extension arm mounted, at a predetermined height, on each mounting column for rotation about a common horizontal axis of rotation;

at least one controllable drive member for rotating said two extension arms about said horizontal axis of rotation;

a transverse member connected between respective ends of said two extension arms facing away from said mounting columns via hinge joints; and

further hinge joints for connecting said at least one silencer to said transverse member between said two extension arms.

5,461,963

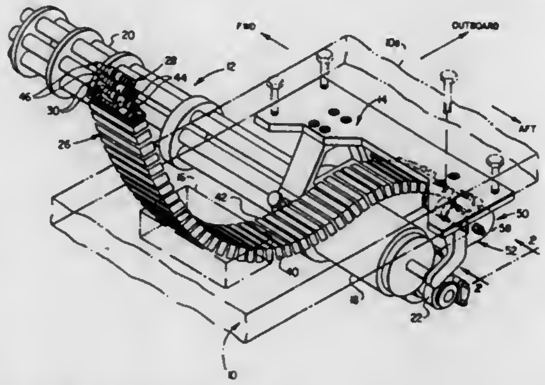
FEED CHUTE-TO-GUN AMMUNITION BELT GUIDE ADAPTER FOR MACHINE GUNS

Paul H. Sanderson, 2019 Cripple Creek, Lewisville, Tex. 75067

Division of Ser. No. 218,229, Mar. 25, 1994. This application Jan. 10, 1995, Ser. No. 374,879

Int. Cl.^{6} F41A *23/02*

U.S. Cl. 89—37.22 **13 Claims**



1. Aircraft armament apparatus comprising:

a support plank having a top side, a bottom side, an outer end portion, and a slot extending through said outer end portion from said top side to said bottom side;

a machine gun secured to said bottom side of said outer end portion of said support plank in a downwardly spaced relationship therewith longitudinally outwardly of said slot, said machine gun having an outboard side with a gun feeder mechanism thereon, said gun feeder mechanism having an inlet;

a flexible feed chute extending downwardly through said slot, passing over said machine gun, and having an outlet end adjacent said gun feeder mechanism inlet;

a feed adapter interconnected between said gun feeder mechanism inlet and said outlet end of said feed chute, said feed adapter including:

a housing through which an ammunition belt may be longitudinally supplied to said gun feeder mechanism, said housing having an outlet end connected to said gun feeder mechanism inlet, an inlet end connected to said outlet end of said feed chute, and a relatively sharply bent intermediate portion disposed between the housing inlet and outlet ends, and

a roller member rotationally supported in said intermediate portion of said housing and having an external side surface with an annular tapered shoulder portion thereon; and

an ammunition belt formed from a series of interlinked ammunition rounds having casing portions with tapered annular shoulders thereon, said ammunition belt longitudinally extending through said feed chute, passing around said roller member, and having an outer end operatively connected to said gun feeder mechanism inlet, said annular tapered shoulder portion of said roller member having a configuration complementary to the configurations of said ammunition round casing shoulders and positioned to act as an abutment therefor within said intermediate housing portion in a manner inhibiting side edge-to-side edge movement, relative to said housing, of the portion of said ammunition belt within said housing.

5,461,964

POWER-ASSISTED STEERING WITH AUTOMATIC COMPENSATION FOR CLEARANCE

Esteve Cortes Guasch, Barcelone, and Raimon Soler Bruguera, Granollers, both of, Spain, assignors to Bendix Espana S.A., Barcelone, Spain

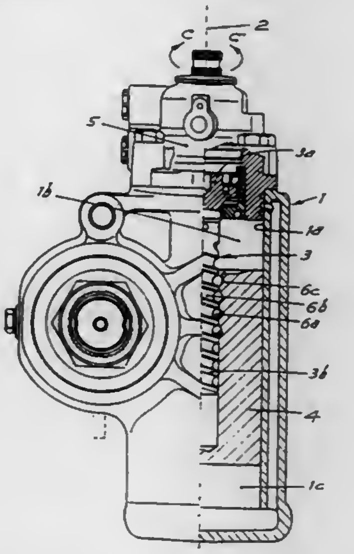
PCT No. PCT/EP93/02473, § 371 Date Oct. 12, 1993, § 102(e) Date Oct. 12, 1993, PCT Pub. No. WO94/08835, PCT Pub. Date Apr. 28, 1994

PCT Filed Sep. 13, 1993, Ser. No. 133,073

Claims priority, application Spain, Jan. 15, 1992, 9202047

Int. Cl.^{6} F15B *9/10;* B62D *5/06*

U.S. Cl. 91—375 R **6 Claims**



1. A roller-contact bearing device for use in a power-assisted steering system comprising:

a casing having a sealed internal volume which at least partially defines a cylinder with an axis of revolution;

a shaft housed in said internal volume and translationally fixed along the axis of revolution, said shaft having a first end connected to receive rotational input torque from a source external to said casing and a second end;

a piston for separating said internal volume into first and second sealed pressure chambers, said first and second sealed chambers being subjected to varying pressures as a function of said input torque applied to said first end of said shaft, said varying pressures exerting a transulational force on said piston for the development of an output torque;

a movement converter located between said piston and said second end of said shaft for changing rotational movement of said shaft into transulational movement of said piston, said shaft being subjected to axial forces of variable intensity and direction as a function of said input torque;

a first roller-contact bearing located adjacent said first end of said shaft and said casing to transmit axial forces applied to said second end of said shaft into said casing;

a second roller-contact bearing located adjacent said first end of said shaft and said casing, said second roller-contact bearing automatically compensating for axial clearance between said shaft and casing; and

elastic means bearing on said casing for exerting an axial force on said second end of said shaft through said second roller-contact bearing, said second axial force being of greater intensity than and opposing an axial force applied to said first end of said shaft.

5,461,965

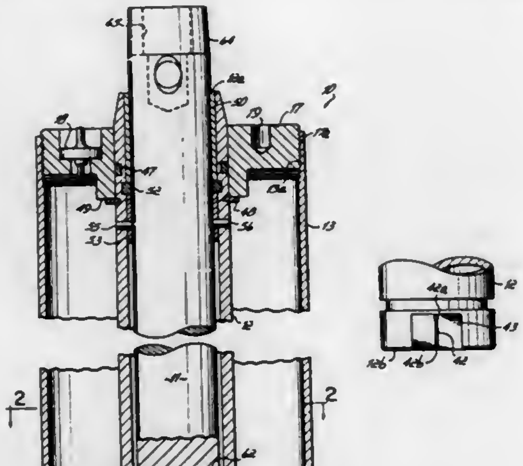
CUSHIONED HYDRAULIC LIFT MECHANISM WITH SLOT IN CYLINDER WALL

Gary G. Schwaegerle, Cincinnati, Ohio, assignor to Reliance Medical Products, Inc., Mason, Ohio

Filed Jun. 24, 1993, Ser. No. 81,965

Int. Cl.^{6} F15B ***15/22;*** **A47C** ***1/02;*** **A61G** ***15/00***

U.S. Cl. 91—408 **18 Claims**



1. In a chair including a hydraulically operated piston apparatus for adjusting the height of said chair, said hydraulic lift mechanism including an outer cylinder having outlet port means extending through a wall of the cylinder for allowing hydraulic fluid to exit the cylinder and an inner telescoping piston rod received by said cylinder and having an upper end extending from an open end of said cylinder and being rigidly secured to said chair, the improvement comprising:

- said outlet port means comprising an elongated slot adapted to be gradually blocked by said piston as said piston moves axially toward one end of said cylinder.

8. A method of operating a chair which is movable by a hydraulic piston apparatus, wherein said hydraulic piston apparatus includes a piston and piston rod connected for movement with said chair, said piston and piston rod being telescopically received in a cylinder and being extendable from and retractable into said cylinder by hydraulic fluid respectively filling said cylinder through an inlet port and draining from said cylinder through an outlet port extending through a wall of the cylinder and shaded as an elongate slot, the method comprising the step of:

- moving said chair by filling said cylinder with hydraulic fluid through said inlet port and moving said piston and piston rod with respect to said cylinder, and
- gradually moving said piston over said elongate slot thereby decreasing the size of said slot as said piston rod approaches the end of a stroke end bringing said chair to a cushioned stop.

5,461,966

MEASURING GAS PUMP

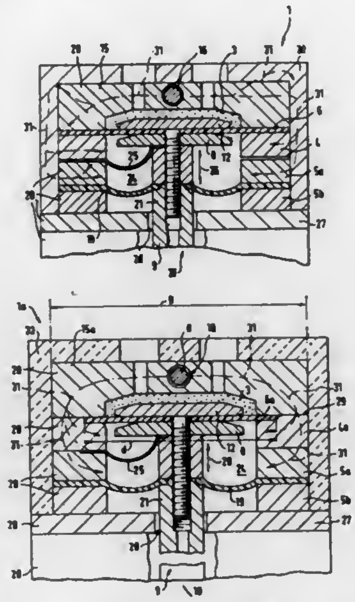
Erich Becker, Bad Krozingen, and Heinz Riedlinger, Freiburg, both of, Germany, assignors to KNF Neuberger GmbH, Freiburg-Munzingen, Germany

Filed Jun. 30, 1994, Ser. No. 269,871

Claims priority, application Germany, Jul. 5, 1993, 43 22 272.2

Int. Cl.^{6} F15B ***21/04***

U.S. Cl. 92—1 **15 Claims**



1. A measuring gas pump (1, 1*a*) comprising a pump case (20) having a pump chamber (3) closed by means of a working diaphragm (6), a connecting rod (9) for imparting a stroke from a crank mechanism (10) to the working diaphragm via a connecting rod head (8), a heat source (16) provided in an upper region of the pump case (20), and at least one heat barrier (19) which contacts the connecting rod (9) located between the connecting rod head (8) and the crank mechanism (20), said barrier impeding dissipation of heat from the heat source (16) and a measuring gas on the one hand and the crank mechanism (20) on the other hand.

5,461,967

SWASH PLATE COMPRESSOR WITH IMPROVED PISTON ALIGNMENT

Michael J. Burkett, Lockport, and Nikolaos A. Adonakis, Grand Island, both of N.Y., assignors to General Motors Corporation, Detroit, Mich.

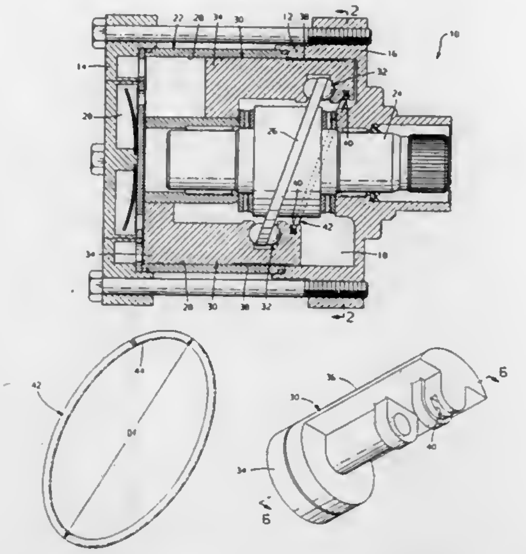
Filed Mar. 3, 1995, Ser. No. 398,335

Int. Cl.^{6} F01B ***3/00***

U.S. Cl. 92—71 **3 Claims**

1. In a compressor of the type having a series of generally cylindrical pistons arrayed within a compressor housing about a central drive shaft, each piston having a front end that reciprocates within a cylinder bore along an axis parallel to said drive shaft and a back end that is driven back and forth by a nutating swash plate on said drive shaft, an alignment means to prevent said pistons from tipping radially inwardly away from their cylinder bore axes, comprising,

- a substantially circular alignment ring surrounding said central axis generally parallel to said swash plate,
- a ring socket formed in each of said piston having a radially inwardly facing surface, said socket being adapted to receive a portion of said alignment ring with close axial and radial contact when said pistons are aligned with their respective cylinder bore axes,
- whereby, as said swash plate nutates, said alignment ring is carried along with said pistons, remaining parallel to said



swash plate, and resisting any tendency of said pistons to cock radially inwardly away from their respective cylinder bore axes.

2. In a compressor of the type having a series of generally cylindrical pistons arrayed within a compressor housing about a central drive shaft, each piston having a front end that reciprocates within a cylinder bore along an axis parallel to said drive shaft and a back end that is driven back and forth by a nutating swash plate on said drive shaft, an alignment means to prevent said pistons from tipping radially inwardly away from their cylinder bore axes, comprising,

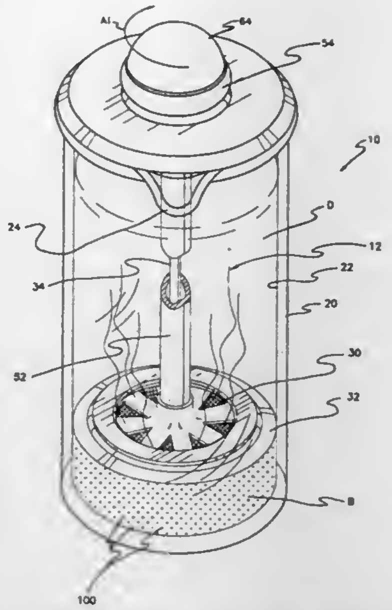
a substantially circular, resilient alignment ring surrounding said central axis generally parallel to said swash plate, said alignment ring being resiliently contractible from a predetermined free state diameter,

a ring socket formed in each of said pistons, said socket comprising a radially inwardly facing slot having a semicircular bottom surface lying on a circle slightly smaller than said ring free state diameter,

whereby, said alignment ring may be contracted and installed in said piston ring sockets, after which said ring expands partially back toward its free state diameter and against said socket bottom surfaces, thereby providing a continual radially outward force on said pistons as said swash plate nutates to prevent said pistons from cocking radially inwardly away from their respective cylinder bore axes.

5,461,968
BREWING POT

Jill Portman, 1783 Rosemary Rd., Highland Park, Ill. 60035
Filed Sep. 2, 1994, Ser. No. 300,437
Int. Cl.^{6} A47J *31/06*
U.S. Cl. 99—287 **5 Claims**



1. An improved pot for brewing comprising:

a brewing pot, including side walls, a bottom, and an opening, said pot having an interior defined by said walls, bottom, and opening;

a screen carrying member having an outer periphery, a screen, and a first screen overlay lying substantially parallel to and proximate said screen, said outer periphery dimensioned to fit snugly within said interior of said pot such that said screen carrying member defines and separates an upper interior portion and a lower interior portion of said pot interior when placed therein;

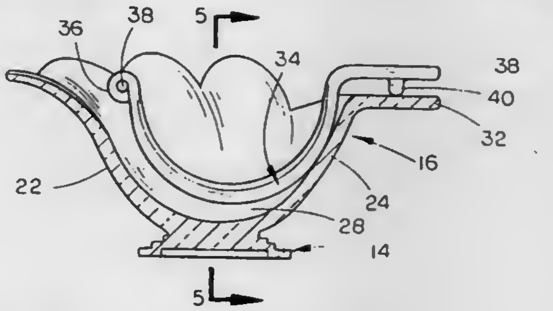
a second overlay rotatable in relation to said first overlay, said second overlay lying substantially parallel to and proximate said first overlay; and

a cover, including a screen carrying member attachment shaft connected to said screen carrying member fixing said screen carrying member substantially in relation to said cover, and an adjustment shaft attached to said second overlay, said adjustment shaft being attached to an adjustment handle;

wherein said first and said second overlays are positioned in a first position wherein fluid communication exists between said upper interior portion and said lower interior portion of said pot interior through said first and second overlays and, further, where said first and said second overlays are positioned in a second position no fluid communication exists between said upper interior portion and said lower interior portion of said pot interior.

5,461,969
LEMON SLICE SQUEEZER

Daniel D. Cretsinger, P.O. Box 244, Coon Rapids, Iowa 50058
Filed Nov. 16, 1994, Ser. No. 340,715
Int. Cl.^{6} A23N *1/00;* **A47J** *19/02;43/00*
U.S. Cl. 99—506 **6 Claims**



1. A lemon squeezer apparatus comprising:

a base portion adapted to be positioned on a horizontal supporting surface such as a table;

a body portion on said base portion and including a pair of horizontally spaced-apart and vertically disposed side walls, said side walls having forward and rearward ends, a front wall extending between the forward ends of said side walls; a back wall extending between the rearward ends of said side walls; said body portion having an open upper end; said side walls and said front and back walls defining an open upper-ended lemon slice receiving compartment having an arcuate lower end which has a configuration generally corresponding to the exterior shape of a semi-circular lemon slice; the upper forward ends of said side walls and said front defining a juice pouring lip;

an elongated and arcuate lemon squeezing handle having forward ends and rearward ends;

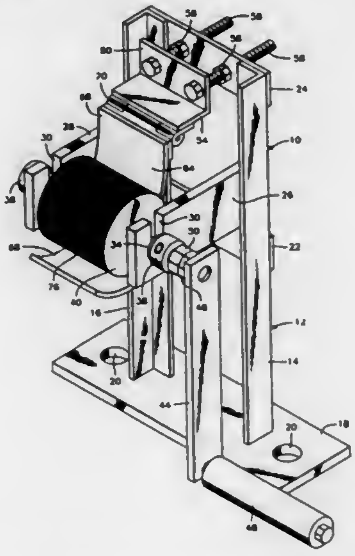
said handle having its forward end positioned between said side walls rearwardly of the forward ends thereof and being pivotally secured thereto;

said handle being selectively pivotally movable with respect to said body portion from a first position to a second position;

said handle, when in its said first position, being positioned to permit the lemon slice to be positioned in said slice receiving compartment;

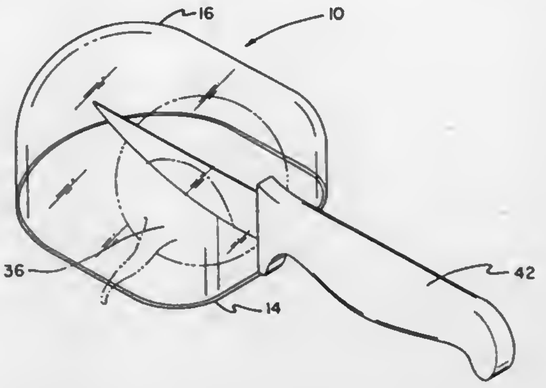
said handle, when moved from its said first position to its said second position, engaging and squeezing the lemon slice in said compartment to squeeze the juice therefrom which remains in the lower portion of said compartment until said body portion is tipped forwardly to permit the lemon juice to flow from said compartment over said juice pouring lip.

5,461,970
PECAN CRACKER
Charles L. Edwards, Jr., 50 Water St., Tarboro, N.C. 27886
Filed Dec. 28, 1994, Ser. No. 364,924
Int. Cl.⁶ A23N *5/00;* **A47J** *43/26*
U.S. Cl. 99—575 **10 Claims**



1. A nut cracker including a mount, a roller journaled from said mount for rotation about a first horizontal axis, a generally horizontally opening, vertically elongated and partial cylindrical abutment including upper and lower end portions projecting above and below the upper and lower peripheries of said roller, mounting means pivotally mounting the upper end portion of said abutment from said mount for angular displacement about a second axis generally paralleling and spaced above and to one side of the axis of rotation of said roller and with said abutment member opening toward said roller, the radius of curvature of said abutment member being generally equal to the spacing between said first and second axes, yieldable stop means operatively connected between said mount and lower end portion defining a yieldable stop against swinging movement of said lower end portion in a direction increasing the spacing between said lower end portion and said roller, means operative to impart rotary torque to said roller, said roller including a nut shell gripping outer peripheral surface.

5,461,971
UNION PEELING DEVICE
Cecil B. Brooks, 5118 Gainesville Dr., Tampa, Fla. 33617
Filed Feb. 23, 1995, Ser. No. 393,434
Int. Cl.⁶ A47J *17/00;* **A47G** *19/00;* **A23L** *1/00*
U.S. Cl. 99—645 **4 Claims**



1. An onion peeling device for enabling a user to effectively peel and slice an onion without disturbance to his/her eyes comprising, in combination:

a shield having a generally circular configuration, the shield having an open lower end and a rounded upper end, the open lower end having a first peripheral portion and a second peripheral portion, the first peripheral portion situated above the second peripheral portion, the first peripheral portion separated from the second peripheral portion by a vertical step portion, the vertical step portion having an upper end and a lower end, the upper end integral with the first peripheral portion, the lower end integral with the second peripheral portion, the shield having a slot formed therein extending upwardly from the vertical step portion, the slot having an upper portion and a lower portion, the upper portion having a width greater than the lower portion, the slot forming edges on opposing sides thereof, the shield adapted to receive an onion within the open lower end thereof, the shield serving to protect a user's eyes from juices produced when slicing the onion;

a rubber strip secured to the edges of the slot of the shield, the rubber strip adapted to secure a knife blade within the slot to be used on an onion within the shield;

a knife having a blade portion adapted to be received within the slot and the rubber strip of the shield, the knife functioning to slice the onion.

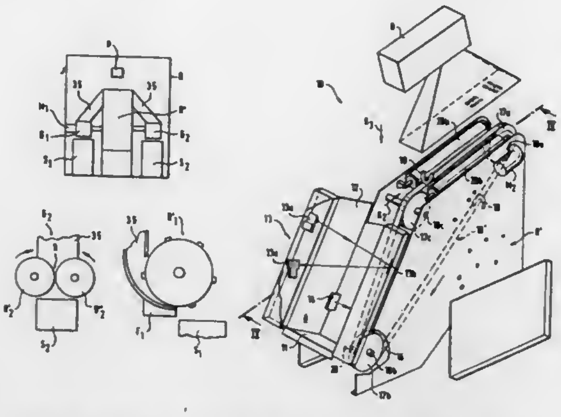
5,461,972
DEVICE FOR HANDLING RECYCLING PACKAGES, SUCH AS BOTTLES AND CANS
Pekka Tähkänen, Helnola, Finland, assignor to Halton System Oy, Helnola, Finland
Filed Feb. 18, 1994, Ser. No. 198,627
Claims priority, application Finland, Feb. 18, 1993, 930729
Int. Cl.⁶ B30B *9/32*
U.S. Cl. 100—45 **21 Claims**

1. A device for handling recycling packages placed in a receiving space of the device, comprising

transfer means for transferring a package from the receiving space to an identification position, said transfer means comprising a conveyor belt and lifting members coupled to said conveyor belt,

a pair of rollers, said conveyor belt being directed such that the package is lifted by said lifting members from the receiving Space onto said rollers,

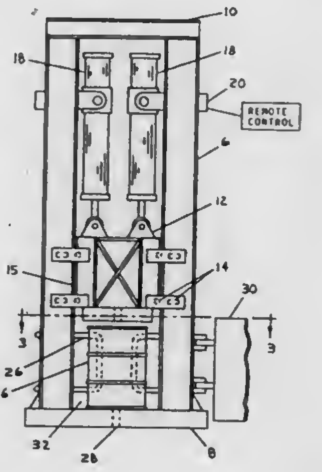
identification means for identifying the package when it is situated in said identification position, and



crushing means to which the package is directed based on its identification for crushing the package and passing the crushed package to a storage container.

5,461,973
DRUM CRUSHER

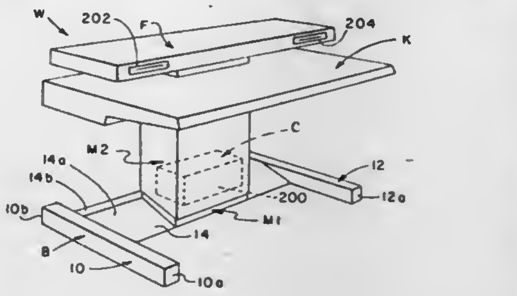
Lew B. Page, P.O. Box 38, Bloomingdale, Mich. 49026
Filed Dec. 17, 1993, Ser. No. 168,182
Int. Cl.^{6} B30B *9/32*
U.S. Cl. 100—53 **24 Claims**



16. A crushing apparatus for compacting a container comprising a frame including a frame bed at one end and a cross structure at another end, and a support attached to the cross structure, plural hydraulic cylinders attached to the support, a guide connected to the support, a ram press member provided within the guide and connected to the hydraulic cylinder, said ram press member being movable along the guide, plural rollers attached to the ram press member for assisting in guiding the ram press member, a remote control connected to the hydraulic cylinders for controlling the hydraulic cylinders for moving said ram press member between plural positions, and plural container locating bars for centering and locating the container in the crushing apparatus prior to crushing.

5,461,974
WORKSTATION WITH INTEGRATED COMPUTER

Raymond P. Reneau, 701 N. St. Mary's St., #27, San Antonio, Tex. 78205
Continuation-in-part of Ser. No. 746,908, Aug. 19, 1991, Pat. No. 5,271,320. This application Dec. 15, 1993, Ser. No. 167,784
The portion of the term of this patent subsequent to Dec. 21, 2010, has been disclaimed.
Int. Cl.^{6} A47B *9/00*
U.S. Cl. 108—147 **25 Claims**

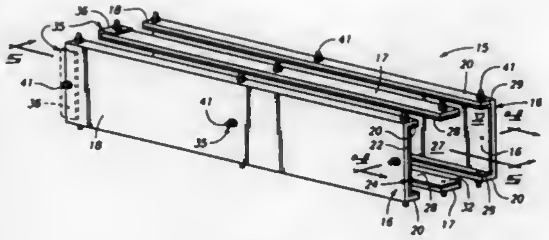


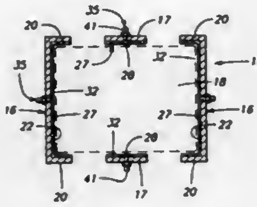
1. A workstation comprising:
a base member;
a first vertical mast formed having an exterior surface and having a first vertical longitudinal axis, said first vertical mast being mounted with said base member and extending upwardly therefrom to an upper end;
a second vertical mast formed having an interior perimeter surface and an outer perimeter surface, said interior perimeter surface being positioned about said exterior surface of said first vertical mast, said second vertical mast having a second vertical longitudinal axis, said second vertical mast being vertically movable with respect to said first vertical mast;
a monitor shelf carried by said second vertical mast for movement therewith;
a third vertical mast formed having an inner surface, said inner surface being positioned about said outer perimeter surface of said second vertical mast, said third vertical mast having a third vertical longitudinal axis, said third vertical mast being vertically movable with respect to said second vertical mast;
a work surface mounted with said third vertical mast for movement therewith, said work surface being selectively positioned below said upper end of said first vertical mast; and
computing means mounted within said first vertical mast for providing selective computing capabilities.

5,461,975
LOW FRICTION BALER LINER

Leland W. Driggs, 2547 Burma Rd., Eureka, Mont. 59917-9431
Filed Jun. 16, 1994, Ser. No. 260,780
Int. Cl.^{6} B30B *15/32;9/30*
U.S. Cl. 100—188 R **15 Claims**

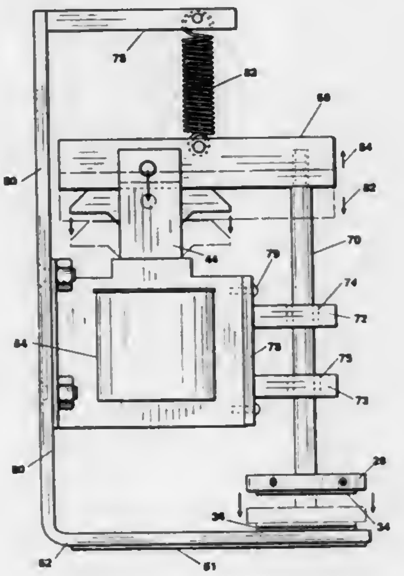
1. A low friction baler chute plate liner for an agricultural material baler having a bale compression chamber and a discharge chute comprised of chute plates leading from forward ends to rearward free ends, comprising:
a liner plate of low friction material for each baler chute plate;
wherein each of said liner plates includes a leading edge and a trailing edge, and a low friction wear surface between said forward and trailing edges;
a mount on the liner plate for securing the liner plate to the baler chute plate with the leading edge adjacent the forward chute plate end; and
wherein the mount is comprised of a bracket on the liner plate at the leading edge thereof for receiving the forward end of the baler chute plate.





5,461,976
POWER DRIVEN SEAL DEVICE

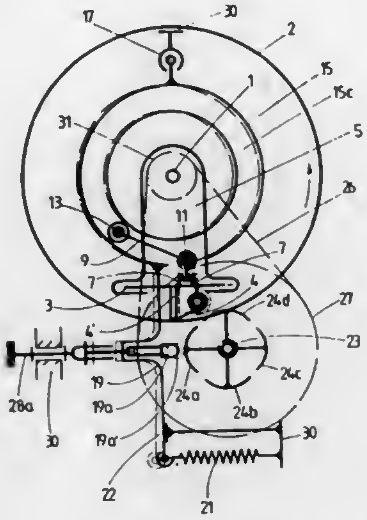
Michael E. Forehand, 2525 N. Norwood Pl., Tulsa, Okla. 74115
Filed Mar. 28, 1994, Ser. No. 218,579
Int. Cl.⁶ B31F *1/07*
U.S. Cl. 101—31.1 **6 Claims**



1. A power driven seal device which comprises:
- a solenoid having a body and a movable core;
- a frame having an upright member and a lateral member;
- a drive bar having a first end fixed to the movable core and extending laterally such that said bar moves up and down with movement of said movable core in a direction parallel to the movement of said core, said bar also having an outer end away from said first end;
- a die holder;
- a drive pin attached to and near the outer end of said drive bar and extending down to and supporting the die holder;
- a splash supported on said lateral member of said frame directly beneath said die holder, said die holder and said splash complementing each other such that when moved together they emboss a design on paper;
- and biasing means for driving said drive pin in a direction away from said lateral member frame.

5,461,977
DEVICE FOR TRANSFERRING SINGLE SHEETS TO THE IMPRESSION CYLINDER OF A SHEET FED ROTARY PRINTING MACHINE

Albrecht J. Germann, Würzburg, Germany, assignor to De La Rue Giori S.A., Lausanne, Switzerland
Filed Feb. 7, 1995, Ser. No. 384,857
Claims priority, application Switzerland, Feb. 17, 1994, 00476/94
Int. Cl.⁶ B41F *11/00*
U.S. Cl. 101—137 **6 Claims**

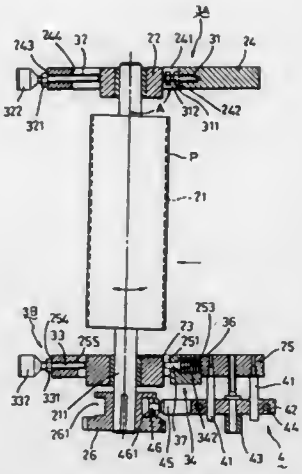


1. A device for transferring single sheets to the impression cylinder (D) of a sheet fed rotary printing machine which has a plate cylinder (P) provided with N printing plates, N being a whole number greater than 1, having a transfer cylinder (2) which interacts with the impression cylinder (D), whose diameter is 1/N of the diameter of the plate cylinder (P) and which completes N revolutions when the plate cylinder (P) does one revolution, having sheet grippers (4) which are installed on the transfer cylinder (2), have a front stop (4*a*) for the arriving sheets (B) and are adjustable by a controllable setting means (9, 10, 15, 16) during each revolution of the transfer cylinder (2) in such a way that, when passing through the transfer position in which a sheet is transferred to the impression cylinder (D), the front stop (4*a*) assumes a position by means of which the precise register of said sheet is adjusted relative to the position of the printing plate which prints it on the plate cylinder (P), wherein the sheet grippers (4) are mounted on a setting plate (3) mounted movably on the transfer cylinder (2), and wherein an individually controllable setting means (9, 11, 13, 15; 10, 12, 14, 16) engages at each end of said setting plate (3), which setting means displaces the relevant end of the setting plate (3) by a predeterminable amount relative to the transfer cylinder (2) in the circumferential direction thereof during each revolution of the transfer cylinder (2).

5,461,978
PRINTING PRESS

Ching-Ho Chou, No. 168, Pao-Chung-Erh St., Hou-Hu Li, Chia-Yi City, Taiwan, Prov. of China
Filed Sep. 27, 1994, Ser. No. 312,645
Int. Cl.⁶ B41F *13/24*
U.S. Cl. 101—248 **10 Claims**

1. A printing press comprising:
- two opposite mounting walls formed with aligned openings wherein a first one of said mounting walls has a distal vertical end face and a periphery which defines said opening and which includes two opposite vertical walls;
- two sliding seats mounted slidably and respectively in said openings wherein a first one of said sliding seats has a first



side opposite a first one of said vertical walls and a second side opposite a second one of said vertical walls;
- a printing roller having a longitudinal axis extending between said mounting walls and further having two opposite ends mounted rotatably and respectively to said sliding seats;
- a printing plate unit mounted to said printing roller;
- a first retaining assembly provided on said first one of said mounting walls for retaining releasably said first one of said sliding seats in a desired position in the respective said opening, said first retaining assembly including a first threaded rod which has a first end portion that extends threadably into said first one of said mounting walls at said first one of said vertical walls and a second end portion that extends into the respective said opening and that abuts against said first side of said first one of said sliding seats, and a second threaded rod which has a first end portion that extends threadably from said distal vertical end face through said second one of said vertical walls and into the respective said opening and that abuts against the second side of said first one of said sliding seats, said second threaded rod further having a second end portion that extends outside said first one of said mounting walls and that is provided with a knob; and
- a second retaining assembly provided on a second one of said mounting walls for retaining releasably a second one of said sliding seats in a desired position in the respective said opening;

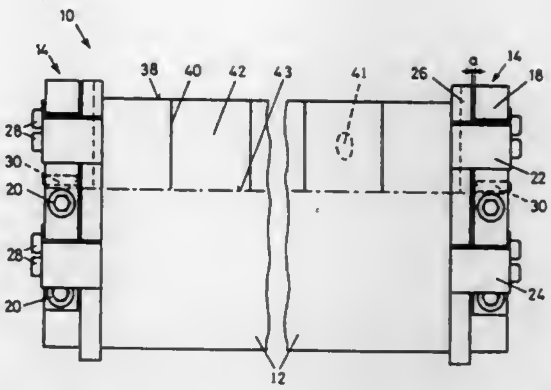
whereby, said first and second retaining assemblies are actuated simultaneously to cause longitudinal sliding movement of said sliding seats within said openings so as to result in movement of said longitudinal axis of said printing roller relative to said mounting walls in a direction parallel to said mounting walls, actuation of said second retaining assembly without actuating said first retaining assembly causing longitudinal sliding movement of said second one of said sliding seats within the respective said opening so as to vary an angle formed between said longitudinal axis of said printing roller and said one of said mounting walls.

5,461,979

MULTIPLE BLADE INK KNIFE

Hanspeter Bruni, Welsikon-Dinhard, Switzerland, assignor to Bruni AG Grafische Maschinen, Andelfingen, Switzerland
Filed Oct. 5, 1993, Ser. No. 132,060
Claims priority, application Switzerland, Jan. 19, 1992, 03236/92
Int. Cl.^{6} B41F *31/04;31/06*
U.S. Cl. 101—365 **14 Claims**

1. Multiple blade ink knife for the ink duct of an offset printing machine, which comprises:



- an ink ductor having a front;
- a knife divided into multiple blades and having a front and two sides, said knife being in the form of a flexible steel plate which can be bent differently in zones against said ink ductor by regulator elements arranged on each blade;
- two-part side jaws with one part on each side of the knife;
- a knife holder, with the knife and side jaws connected to the knife holder;

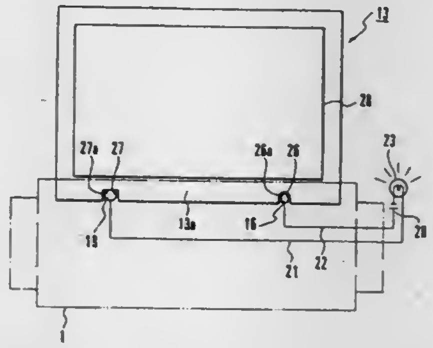
wherein the side jaws each have an outer metal jaw and an inner plastic jaw, with the inner plastic jaw in resilient pressing relationship against the front of the ink ductor and also against the front of the knife; and

wherein the multiple blade ink knife together with the side jaws is a complete unit for the ink duct of an offset printing machine.

5,461,980

PLATE MOUNTING APPARATUS FOR PRINTING PRESS

Kazuhiro Maejima, and Toshiharu Takemata, both of Ibaragi, Japan, assignors to Komori Corporation, Tokyo, Japan
Continuation of Ser. No. 96,924, Jul. 23, 1993, abandoned.
This application Apr. 21, 1994, Ser. No. 231,983
Claims priority, application Japan, Jul. 31, 1992, 4-059158 U
Int. Cl.^{6} B41F *1/28*
U.S. Cl. 101—415.1 **6 Claims**



1. An apparatus for mounting a plate on a plate cylinder, comprising:
- a plate lockup device provided in a gap formed in a circumferential surface of said plate cylinder;
- a reference pin supported by a gripper portion of said plate lockup device and engaged with a reference pin hole formed at an insertion end of a plate when said plate is inserted into said gripper portion of said plate lockup device;
- plate detecting means, arranged in the reference pin to oppose only a bottom portion of said reference pin hole, for electrically detecting that said bottom portion of said reference pin hole contacts said reference pin, and does not detect the plate insertion even when the side portion of the reference pin hole contacts said reference pin; and
- indicator means for confirming and indicating insertion of the plate on the basis of an output from said plate detecting means.

5,461,981

PRESS BLANKET CYLINDER WITH BLANKET END EJECTION DEVICE

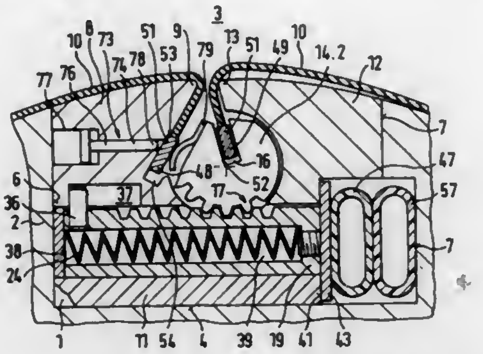
Georg Schneider, Würzburg, Germany, assignor to Koenig & Bauer Aktiengesellschaft, Wurzburg, Germany

Filed Aug. 3, 1994, Ser. No. 285,298

Claims priority, application Germany, Aug. 5, 1993, 43 26 251.1

Int. Cl.^{6} B41F *27/00*

U.S. Cl. 101—415.1 **6 Claims**



1. A blanket end ejection device usable to eject an edge strip of a press blanket from a clamping groove in a press blanket cylinder, said blanket end ejection device comprising:

- a press cylinder supported for rotation about an axis of rotation and having a press blanket clamping groove extending generally parallel to said axis of rotation;
- an insert strip positioned in said press blanket clamping groove;
- an edge strip receiving groove formed in said insert strip and being adapted to engageably receive and hold an edge strip of an end of a press blanket; and
- at least one ejection pin slidably supported in said insert strip and having a free end which is insertable into said clamping groove into engagement with said edge strip to unseat an edge strip from said edge strip receiving groove.

5,461,982

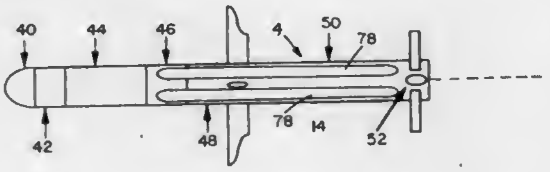
MISSILES HAVING MEANS FOR MARKING TARGETS DESTROYED BY SAID MISSILES TO PREVENT FURTHER EXPENDITURE OF MUNITIONS TO SAID TARGET

Lynn L. Boyer, III, 2202 Manassas Dr., SW., Huntsville, Ala. 35803

Filed Jul. 19, 1993, Ser. No. 93,485

Int. Cl.^{6} F42B *12/40*

U.S. Cl. 102—513 **16 Claims**



1. In a missile disposed for flight in a trajectory ending at a target, said missile comprising a warhead which substantially destroys said target and means for marking said destroyed target to indicate a disabled target responsive to impact of said warhead with said target;

- at least one housing carried by said missile, said housing being separate and distinct from said warhead;
- a substantially semi-permanent target marking material carried in said housing which adheres to said target responsive to impact of said warhead and said housing with said target, said target marking material serving as an indication that said target has been substantially destroyed as a result of said warhead impact therewith and that no further munitions need to be expended at the target.

5,461,983

GAS GENERATOR

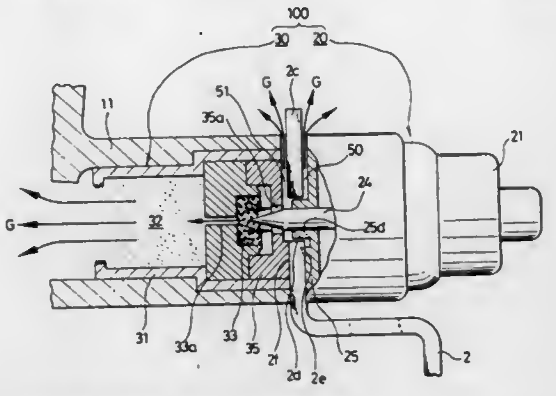
Masuo Matsuki, and Haruyuki Ikesue, both of Kanagawa, Japan, assignors to NSK Ltd., Tokyo, Japan

Filed Jul. 11, 1994, Ser. No. 272,536

Claims priority, application Japan, Jul. 14, 1993, 5-043266 U

Int. Cl.^{6} B60R *21/26*

U.S. Cl. 102—530 **13 Claims**



1. A gas generating device comprising:

- a gas generator having a detonator;
- a hammer pin trigger device having a hammer pin arranged movably towards said detonator so that said hammerpin is caused to strike and fire said detonator; and
- gas guide means arranged at a joint portion between said gas generator and said hammer pin trigger device for guiding gas, which occurs upon firing said detonator, in a specific direction to an outside of said gas generating device, wherein said gas guide means comprises a gas guide slot formed in said gas generator.

5,461,984

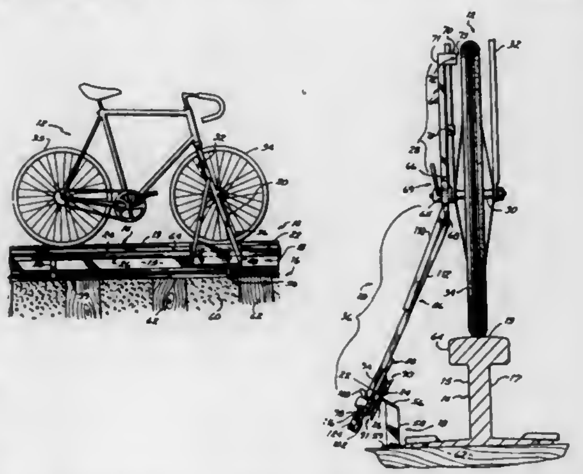
APPARATUS AND METHOD FOR ENABLING A TWO-WHEELED VEHICLE TO TRAVEL ALONG A RAILROAD TRACK

F. Jay Andress, III, 3524 Holly Ave., Cincinnati, Ohio 45208

Filed Nov. 16, 1993, Ser. No. 153,580

Int. Cl.^{6} A63G *31/00;* **B61F** *9/00*

U.S. Cl. 104—243 **77 Claims**



1. A system for a two-wheeled vehicle having a steerable wheel rotatable about an axle and a fork supporting said axle to enable

said vehicle to travel along an elongated railroad track with its two wheels upon a top surface of said track, the system comprising:

an elongated guide component including a guide web having top and bottom edges with connecting faces, the top and bottom edges and respective adjacent portions of the faces cooperating to define spaced apart guidance surfaces, one guidance surface being elevated relative to the other, the elongated guide component further including structure for rigidly fixing the guide web relative to said railroad track with the guidance surfaces being held in fixed spatial relationship to one side of said railroad track and supporting the guide web at an angle such that the top edge of the guide web is closer to said railroad track than the bottom edge; and

a stabilizer component having a proximal end being couplable to said axle and fork of said steerable wheel to secure the stabilizer component to said two-wheeled vehicle and a distal end having bearing surfaces spaced to movably bear against respective ones of the guidance surfaces of the elongated guide component, the elongated guide component and stabilizer component cooperating such that one bearing surface bears against one guidance surface when said two-wheeled vehicle tips in a direction toward the elongated guide component and the other bearing surface bears against the other guidance surface when said two-wheeled vehicle tips in a direction away from the elongated guide component,

whereby the elongated guide component and stabilizer component cooperate to stabilize and guide said two-wheeled vehicle along said elongated railroad track.

5,461,985

TRAVELING TROLLEY, IN PARTICULAR SINGLE-RAIL TROLLEY WITH COMPACT HEIGHT

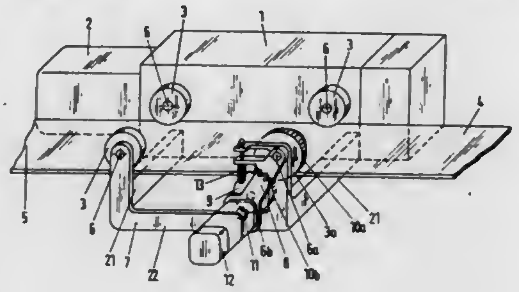
Udo Gersemsky, Herdecke, Germany, assignor to Mannesmann Aktiengesellschaft, Dusseldorf, Germany

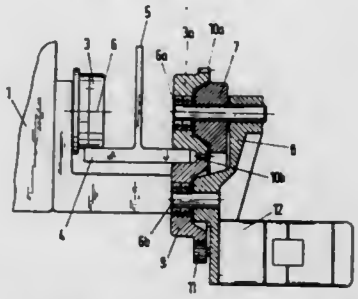
Filed Apr. 13, 1994, Ser. No. 226,946

Claims priority, application Germany, Apr. 13, 1993, 43 12 908.0

Int. Cl.^{6} B61C *11/00*

U.S. Cl. 105—30 **12 Claims**





1. A compact-height travelling trolley for use on a single rail having a bottom flange, comprising:

a supporting frame;

a hoist including a hoist housing;

a first pair of non-driven running wheels movable along an upper surface of the bottom flange, one of said running wheels being rotatably secured to said hoist housing and the other of said running wheels being rotatably secured to said supporting frame;

a second pair of running wheels movable along the bottom flange upper surface, one of said second pair of running wheels being non-driven and rotatably secured to said hoist housing and the other of said second pair of running wheels being a driven wheel rotatably secured directly on a wheel axle fixed directly to said supporting frame;

a lever member pivotally secured to said supporting frame proximate said driven wheel;

a friction wheel rotatably secured to said lever member, said friction wheel being adapted to engage a bottom surface of the bottom flange;

means for driving said friction wheel and said driven wheel whereby said friction wheel is in drive connection with said driven wheel; and

means for urging said friction wheel into engagement with the bottom surface of the bottom flange.

5,461,986

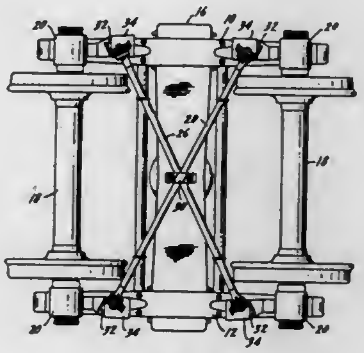
DIAGONALLY BRACED RAIL TRUCK WITH IMPROVED END BLOCK

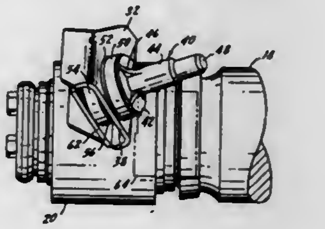
John T. Sarnicki, Elgin, and Thomas R. Berg, Clarendon Hills, both of Ill., assignors to Standard Car Truck Company, Park Ridge, Ill.

Filed Jul. 5, 1994, Ser. No. 270,505

Int. Cl.^{6} B61F *5/00*

U.S. Cl. 105—165 **7 Claims**





7. An end block for use in attaching a cross brace to a side frame of a railroad car truck, said end block including a generally annular flange adapted to be positioned against a side frame elastomeric mounting element, an axially extending nose integral with said flange, said nose having a first portion of a first diameter and a second portion of a second diameter, said second portion diameter being less than that of said first portion diameter, said second portion being formed and adapted to extend within a cross brace, and reinforcing means extending between and integral with said flange and axially extending nose, said axially extending nose having a profile such as not to materially interfere with a scan area of a hot box detector mounted adjacent one of a railroad track rail.

5,461,987

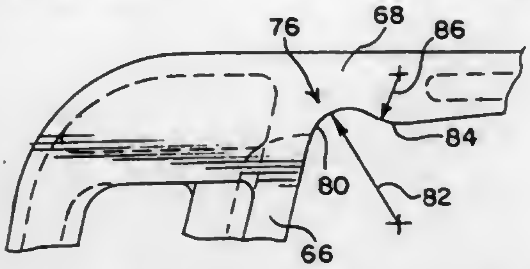
SIDE ARM STRUCTURE OF A STEERING ARM ASSEMBLY HAVING AN UNDERCUT RADIUS

Rami V. Nassar, Chicago, Ill., assignor to AMSTED Industries Incorporated, Chicago, Ill.

Filed Jul. 18, 1994, Ser. No. 276,563

Int. Cl.^{6} B61F *5/50*

U.S. Cl. 105—167 **7 Claims**



1. In a steering arm assembly for lateral control of a railway car truck having a pivotal truck frame with a longitudinal axis, said truck frame including a first sideframe element and a second sideframe element, which first and second sideframe elements are about parallel, each said first and second sideframe element having a mid-region, a forward end and a rear end,

a transverse frame element extending between said first and second sideframe element mid-regions,

a pair of longitudinally spaced wheelsets, each said wheelset having an axle with spaced apart wheels fixed thereon, a wheelset mounted at each of said forward end and rear end of said sideframe elements, said steering arm assembly comprising:

a first U-shaped steering arm sub-assembly and a second U-shaped steering arm sub-assembly, said first and second steering arm sub-assemblies operable to provide transmission of steering forces from one of said wheelsets to the other of said wheelsets independent of the relative lateral position of the steering arm sub-assemblies and truck frame elements, each said first and second steering arm sub-assemblies having a respective cross beam with a first end and a second end, and

each of said first and second steering arm sub-assemblies having a respective first side arm and a second side arm, one of said first and second side arms joined to a respective said cross-beam first end and the other of said first and second side arms joined to the other of said cross-beam first and second ends,

each of said first and second side arms comprised of a respective body portion and a respective longitudinal segment, each said longitudinal segment extending generally from a respective said cross-beam for connection to a respective said axle, said longitudinal segment of each first and second sub-assembly sidearm generally parallel to said longitudinal segment of the other said first and second sub-assembly sidearm,

each said longitudinal segment and said body portion having a respective inner surface and a respective outer surface, said inner surface of each said body portion disposed generally normal to a corresponding said inner surface of each said longitudinal segment and forming a respective inner junction on each of said sub-assembly sidearms,

each said side arm inner junction comprising an undercut compound radius having a first radius in proximity to said body portion and a second radius in proximity to said longitudinal segment, said undercut compound radius defining a generally ovate depression and ovate surface in said sidearm wherein said ovate surface forms a first contact area with said body portion inner surface and a second contact area with said longitudinal segment inner surface,

said ovate surface at said first contact area generally tangentially joined to said inner surface of said body portion and said ovate surface at said second contact area joined with said inner surface of said longitudinal segment at said second radius, said second radius having a generally convex configuration with respect to said inner surface of said longitudinal segment,

said undercut compound radius providing a relatively smooth cross sectional transition between said body portion and said longitudinal portion, thereby reducing the stress intensity at said junction while maintaining clearance for said wheels and truck elements, said reduction in stress intensity resultantly corresponding to an increase in fatigue life of said sidearm.

5,461,988

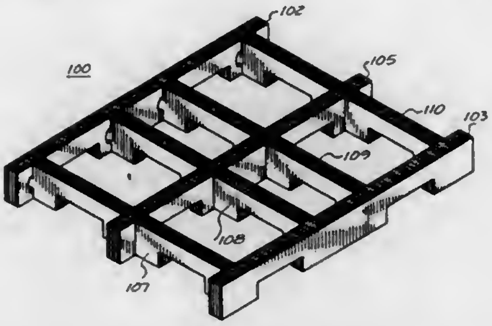
RECYCLABLE LIGHTWEIGHT PALLET

Kasey H. Cummings, Mesa, and Robert D. Champion, Phoenix, both of Ariz., assignors to Champion Containers, Tempe, Ariz.

Filed Dec. 28, 1993, Ser. No. 174,528

Int. Cl.^{6} B65D *19/00*

U.S. Cl. 108—51.3 **8 Claims**



1. A recyclable lightweight pallet comprising:

a plurality of elongated runners, each including a plurality of first elongated parallel juxtaposed runner sections of fiber board, each with laterally extending generally circular openings formed therethrough and longitudinally spaced apart therealong, the circular openings including radially inwardly extending stops, and at least a second elongated parallel juxtaposed section with laterally extending slot-shaped openings formed therethrough and longitudinally spaced apart therealong, with the section having the slot-shaped openings being positioned to form an inner surface of the elongated runner, the slot-shaped openings and the circular openings being axially aligned to form an assembled opening; and

a plurality of elongated mating crosspieces defining opposed assembled ends, each crosspiece including a plurality of elongated parallel juxtaposed crosspiece sections of fiber board, with each assembled end of each crosspiece being formed to mate with an assembled opening in one of the plurality of runners, the runners and mating crosspieces forming a generally rectangular pallet.

5,461,989

TABLE IN PLASTIC MATERIAL

Charly Grandclement, and Bruno Magnin, both of Oyonnax, France, assignors to Grosfillex S.A.R.L., Oyonnax, France

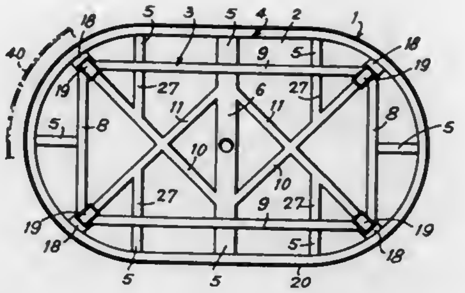
Filed Jul. 6, 1993, Ser. No. 88,218

Claims priority, application France, Jul. 3, 1992, 92 08276

Int. Cl.^{6} A47B *3/06*

U.S. Cl. 108—153 **12 Claims**

1. A table in molded plastic material comprising a flat panel, a frame structure and legs, said flat panel constituting a top of said table and having a lower face, said table further comprising a first peripheral skirt projecting downwardly from said flat panel, said skirt having an inner side, an outer side and a lower edge, said frame structure cooperating with said lower face of said flat panel and being composed of an assembly of first section pieces having free upper edges, said first section pieces being connected one to another without any connection web disposed between said first sections pieces, said lower face of said flat panel resting only on said free upper edges of said first section pieces, said first section



pieces of said frame structure comprising first and second peripheral section pieces, said first peripheral section piece defining an inner contour and having said legs of said table depending therefrom, said second peripheral section piece defining a first outer contour and being disposed substantially against said inner side of said first peripheral skirt of said flat panel, the latter having first snap-engaging elements which cooperate with said second peripheral section piece in order to secure said flat panel to said frame structure, said second peripheral section piece having a lower face of which at least one part is disposed substantially coplanar with said lower edge of said skirt, so that said second peripheral section piece and said skirt form a first thick element which provides a hand-grip if the table has to be moved.

5,461,990

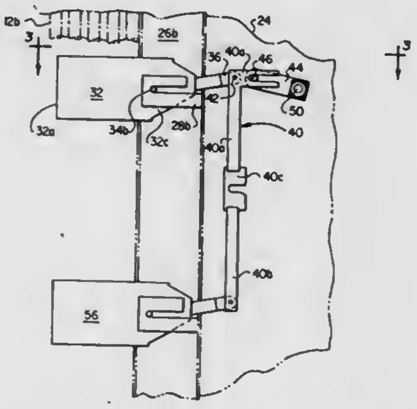
MOUNTING AND LINKAGE SYSTEM FOR BURNERS IN A FURNACE

Lawrence F. Newman, Dumont, N.J., assignor to Foster Wheeler Energy Corporation, Clintor., N.J.

Filed Aug. 11, 1994, Ser. No. 288,863

Int. Cl.⁶ F23C *1/10*

U.S. Cl. 110—261 **28 Claims**



18. Apparatus for discharging air or a mixture of air and fuel into a furnace having four walls defining at least one corner, said apparatus comprising two wall portions extending from said corner in a spaced relation to define a space communicating with the interior of said furnace, a discharge device extending in said space for discharging fuel, or a mixture of fuel and air, into the interior of said furnace, said discharge device comprising a first member, a pair of support pins extending outwardly from said first member, and a second member extending over, and pivotally mounted relative to, said first member; two plates respectively mounted to said wall portions with each plate defining a slot for respectively receiving said pins for mounting said first member relative to said wall portions while permitting relative movement between said first member and said wall portions; drive means for generating a torque; and linkage means connecting said drive means to said second member for pivoting said second member relative to said first member to vary the direction of said discharge, said linkage means comprising means for permitting axial movement of said second member relative to said linkage means.

5,461,991

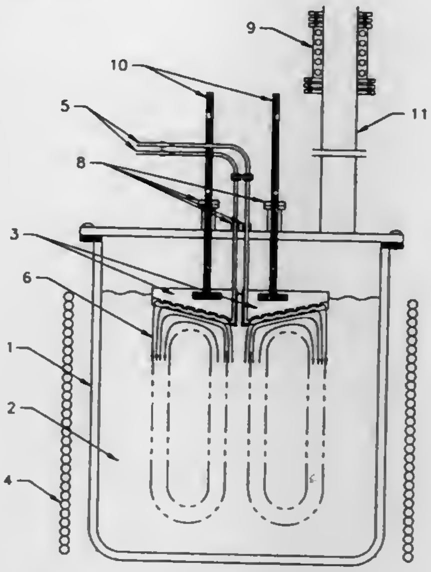
EQUIPMENT AND PROCESS FOR MOLTEN ALLOY PYROLYSIS OF HAZARDOUS LIQUID WASTE

Anthony S. Wagner, 13709 Hwy. 71 W., Bee Caves, Tex. 78738-3113

Continuation-in-part of Ser. No. 103,122, Aug. 9, 1993, Pat. No. 5,359,947, which is a continuation-in-part of Ser. No. 982,450, Nov. 27, 1992, Pat. No. 5,271,341, which is a continuation-in-part of Ser. No. 699,756, May 14, 1991, Pat. No. 5,167,919, which is a continuation-in-part of Ser. No. 524,278, May 16, 1990, Pat. No. 5,000,101. This application Apr. 11, 1994, Ser. No. 225,612

Int. Cl.⁶ F23G *7/04*; C02F *1/72*

U.S. Cl. 110—346 **3 Claims**



1. A Circulating Molten Alloy Waste Pyrolysis Process and Equipment comprising:

a) a molten alloy bath;

b) adjustable submerged ceramic diffuser units in said bath;

c) a feed pump and flexible feed lines,said feed lines being connected to rigid feed lines leading into said ceramic diffuser units and to a discharge of said feed pumps;

d) an off gas line from said alloy bath;

e) an induction heater means in said off gas line to heat off gas in said off gas line to above 250 degrees centigrade;

f) spray nozzles in said off gas line downstream of said induction heater means;

g) a scrubber connected to an exit end of said off gas line;

h) a drain line from said scrubber;

i) a sludge pump taking suction from said drain line;

j) a carbon removal filter means in a discharge line from said sludge pump, acting to remove carbon particles, with discharge liquid recycling to said spray nozzles;

k) an inert gas purge means to purge oxygen from said unit.

5,461,992

DEEP ROOT TREE AND SHRUB FERTILIZER STAKE DRIVERS

Robert A. Scollard, 3306 Duck Creek Rd., Billings, Mont. 59107

Filed Nov. 9, 1993, Ser. No. 149,517

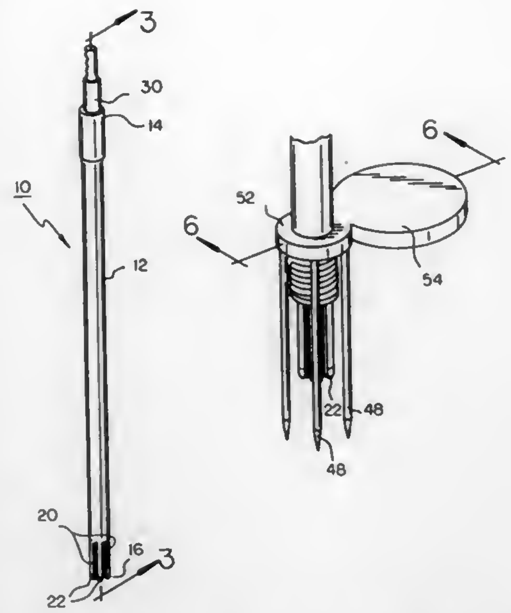
Int. Cl.⁶ A01C *5/02*

U.S. Cl. 111—7.2 **2 Claims**

2. A deep root tree and shrub fertilizer stake driver comprising:

an elongated tube having a hollow cylindrical configuration and having an upper end and a lower end;

a plurality of axial slots formed in the tube extending upwardly from the lower end thereof;



- a rigid rod having an upper end and a lower end slidably positionable within the tube of a slightly longer length as the tube;
- a plurality of spikes coupled with respect to the tube adjacent to the lower end of the tube and extendable to a distance beyond the lower end of the tube and with a foot pedal secured to the tube to drive the spikes into the ground; and
- a spring having an upper end coupled to the pedal along a lower surface of the pedal and a lower end coupled to the lower end of the tube.

5,461,993
TRACTOR-DRAWN DIRECT SEED SOWING APPARATUS

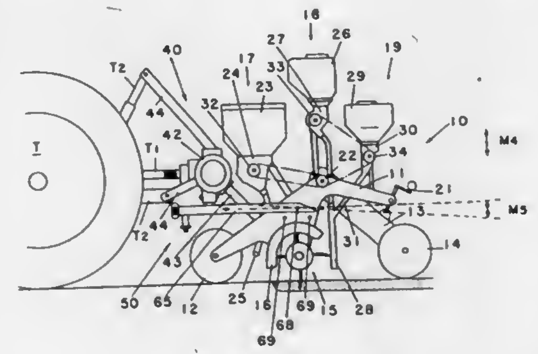
Junichi Ikumoto, and Akio Yasuda, both of Okayama, Japan, assignors to Minoru Industrial Company, Limited, Okayama, Japan

Filed Nov. 30, 1993, Ser. No. 159,437

Claims priority, application Japan, Nov. 30, 1992, 4-355284; Apr. 15, 1993, 5-114012

Int. Cl.⁶ A01C *5/00*

U.S. Cl. 111—52 **10 Claims**



1. A tractor-drawn seed sowing apparatus comprising:
- a seed sower which sows seeds while traveling on a surface of ground and making sowing furrows in said ground by means of furrow-cutting claw wheels;
- a power transmitter connected to a tractor so as to transmit a driving force of said tractor to said seed sower; and
- a coupler means for connecting said seed sower to said power transmitter; wherein:
- said coupler means is constructed so that said seed sower is allowed to make up-and-down, pitching and rolling motions;
- said coupler means is constructed so that said seed sower is allowed to make a yawing motion; and
- said coupler means includes a pair of lift arms which are connected to said power transmitter so that lift arms can make up-and-down, rolling and yawing motions, and said seed sower is connected to rear portions of said lift arms so that seed sower can make a vertical rotational motion.

5,461,994
SEED DRILL PLANTING ASSEMBLY

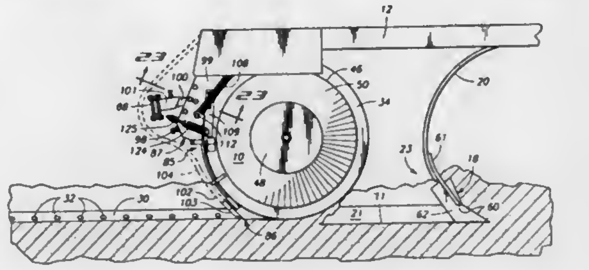
Robert Zimmerman, Box 6, Almira, Wash. 99103

Continuation-in-part of Ser. No. 847,784, Mar. 5, 1992, Pat. No. 5,309,852. This application Dec. 22, 1993, Ser. No. 173,507

The portion of the term of this patent subsequent to May 10, 2011, has been disclaimed.

Int. Cl.⁶ A01B *35/16*

U.S. Cl. 111—121 **41 Claims**



1. A seed drill planting assembly comprising:
- a press wheel assembly rotatably mounted about a horizontal transverse axis for rolling soil engagement while moving in a forward direction along a field;
- a boot located in a transversely centered upright position behind the press wheel assembly;
- a narrow longitudinal runner mounted to a lower end of the boot, the runner extending rearwardly from beneath the press wheel assembly;
- guides in engagement with the boot for permitting movement of the boot and runner along an upright arcuate path substantially centered about the transverse axis of the press wheel assembly; and
- seed delivery means on the runner for depositing seeds immediately behind the runner.

5,461,995
ROTARY ROW CLEANER WITH REVERSIBLE SPRING

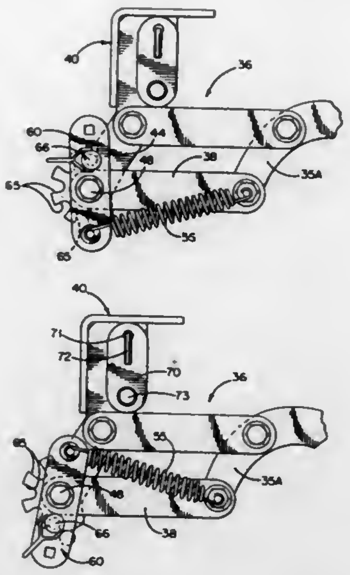
Dean A. Winterton, Paw Paw, Lee County, Lee, Ill. 60530, assignor to Dean A. Winterton, and Paw Paw Farmer's Factory Co., Lee, both of Ill.

Filed Feb. 25, 1994, Ser. No. 201,770

Int. Cl.⁶ A01C *5/06*

U.S. Cl. 111—139 **8 Claims**

1. Apparatus for use with a planter unit having an elongated and laterally extending bar by which the planter unit is pulled forwardly, the planter unit having means for opening a furrow in minimally tilled or untilled soil, said apparatus comprising a pair of vertically spaced and generally parallel bars having forward ends pivotally connected to said elongated bar to swing upwardly and downwardly independently of said furrow opening means, said parallel bars extending rearwardly from said elongated bar, a mounting bracket pivotally connected to the rear ends of said parallel bars, a pair of toothed sweeper wheels rotatably supported by said mounting bracket and located ahead of said furrow opening means, said wheels being positioned in engagement with the soil and being positioned with their centers on opposite sides of a



vertical plane in the path of travel of said furrow opening means whereby forward movement of said planter unit rotatably drives said wheels to cause the wheels to pull residue in laterally opposite directions away from the path of the advancing furrow opening means, the improvement in said apparatus comprising, spring means having first end means connected to said parallel bars, said spring means being selectively adjustable between a first position biasing the rear ends of said bars downwardly and a second position biasing the rear ends of said bars upwardly whereby said spring means presses said wheels into the soil when said spring means is in said first position and reduces the weight of the wheels on the soil when said spring means is in said second position, said spring means being adjustable between said first and second positions while said first end means of said spring means remain connected to said parallel bars and without need of said first end means being disconnected from said bars.

5,461,996

TUFTING MACHINE AND METHOD FOR PRODUCING TUFTED DESIGN IN CARPETING AND PRODUCT WITH TUFTED DESIGN

Kaju Sadayoshi, Osaka, Japan, assignor to Ohno Co., Ltd., Sakai, Japan

Continuation-in-part of Ser. No. 61,819, May 13, 1993, abandoned, which is a continuation of Ser. No. 983,096, Nov. 27, 1992, abandoned, which is a continuation of Ser. No. 676,208, Mar. 27, 1991, abandoned. This application Dec. 22, 1993, Ser. No. 171,655

Claims priority, application Japan, Apr. 13, 1990, 2-97842

The portion of the term of this patent subsequent to Feb. 28, 2012, has been disclaimed.

Int. Cl.⁶ D05C *15/14;15/10*

U.S. Cl. 112—80.3 **12 Claims**

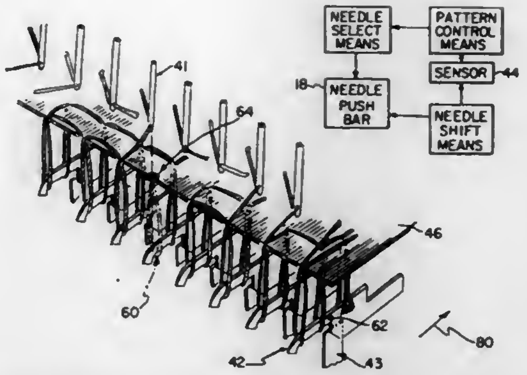
1. A tufting machine for operating on a backing fabric, comprising:

a needle push bar having a plurality of laterally aligned needles separated from each other by spacings of substantially equal distance each arranged for carrying pile yarn when selected;

a plurality of laterally spaced loopers separated from each other by said spacings of substantially equal distance;

needle select means for selecting certain ones of said needles at every needle stroke cycle and for inserting said selected needles into the backing fabric;

feed means for intermittently and longitudinally feeding said backing fabric in a stop and feed manner wherein said backing fabric remains stationary in the longitudinal direction



during a stopping period which is at least one needle stroke cycle in duration and may be fed during a succeeding feeding stroke period;

shift means adapted to shift said needles laterally a distance equivalent to a needle gauge in every needle stroke cycle for aligning said selected ones of said needles each with any one of an associated plurality of said loopers by effecting relative lateral shifting movement between said needles and both said loopers and said backing fabric while said backing fabric remains stationary in the longitudinal direction during said stopping period; and

pattern control means for actuating said needle select means to select any one of the needles for insertion into the backing fabric and for tufting with the pile yarn carried by the selected one of the needles by engagement with a corresponding one of the loopers that is disposed in alignment therewith such that said corresponding one of the loopers seizes only one loop of the pile yarn during any one needle stroke cycle for each stopping period of the stop and feed manner of said feed means.

5,461,997

SEWING MACHINE HAVING PRESSER FOOT LIFTING DEVICE FOR ADJUSTING A PRESSER FOOT BETWEEN FIRST, SECOND, AND THIRD POSITIONS

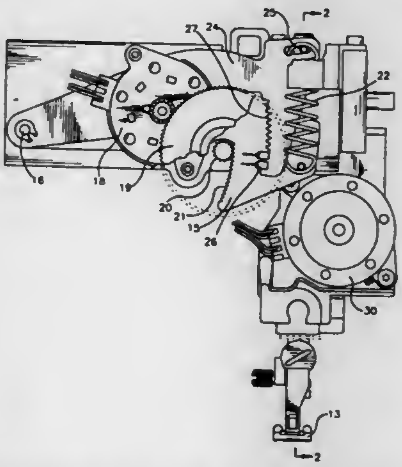
Jan-Olof Landén, Huskvarna, Sweden, assignor to Husqvarna Aktiebolag, Huskvarna, Sweden

Filed Apr. 14, 1994, Ser. No. 227,669

Claims priority, application Sweden, Apr. 21, 1993, 9301319

Int. Cl.⁶ D05B *29/02*

U.S. Cl. 112—237 **9 Claims**



1. An arrangement in a sewing machine of the type which is provided with an electronic control unit, said arrangement comprising a needle mechanism having a needle bar (10), a presser bar (12) provided with a presser foot (13) and actuated by a resilient means (22) in order to provide a controllable presser foot pressure

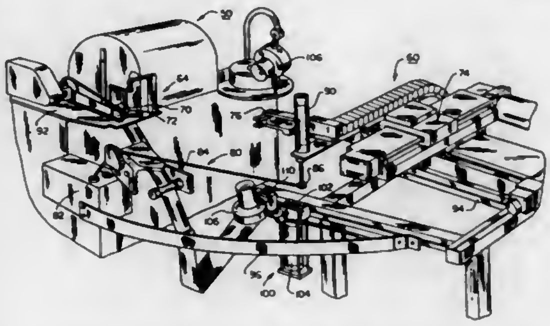
against a cloth (**28**) to be sewn, and a lifting device for adjusting the presser foot between a first operative position in which the presser foot pressure is applied to hold the cloth, a second inoperative position spaced from the cloth, and a third operative position in which the presser foot pressure is removed to release the cloth, wherein said lifting device comprises a power-driven lifting lever (**15**) cooperating with the presser bar (**12**) to adjust the presser foot (**13**) between said first, second, and third positions, said lifting lever (**15**) being operatively connected to said resilient means (**22**) for controlling the presser foot pressure.

5,461,998
FEED SYSTEM FOR A SEWING MACHINE

C. Michael Funderburk, East Bend; P. Kurt Jordan, Kernersville, both of N.C.; John A. Newman, Austinville, Va.; J. C. McEwen, Mocksville, and David C. Howell, Clemmons, both of N.C., assignors to Sara Lee Corporation, Winston-Salem, N.C.

Filed Apr. 5, 1993, Ser. No. 42,547
Int. Cl.⁶ D05B *35/00*

U.S. Cl. 112—306 **5 Claims**



1. An apparatus for frictionlessly supporting the body of a textile article as one edge of the textile article is moved by a feed means and a movable gripper means, said apparatus comprising:

(a) a cable having one end connected to one of said feed means and said gripper means for supporting the body of said textile article beneath the body of said textile article;

(b) retracting means connected to the other end of said cable and mounted adjacent to the other of said feed means and said gripper means, whereby said cable is retracted into said retracting means as the edge of said textile article is moved; and

(c) a guide rail located between said feed means and said gripper means for guiding the lower portion of the body of said textile article.

5,461,999
EDGE GUIDING APPARATUS FOR SEWING MACHINES

Steven Marcangelo, 45 Burgandy Dr., Nashua, N.H. 03062

Filed Apr. 6, 1994, Ser. No. 224,626
Int. Cl.⁶ D05B *27/10*

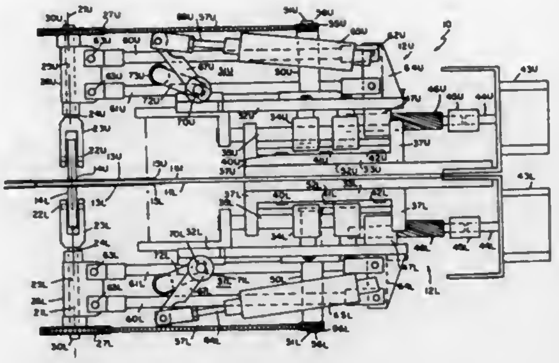
U.S. Cl. 112—306 **11 Claims**

1. In apparatus for receiving fabric in a fabric plane with an edge to be aligned with a reference line through a reference point on the apparatus, edge guiding means for aligning the fabric edge parallel and proximate to the reference line, said guiding means comprising:

A. a friction wheel rotatable about an axle parallel to the fabric for engaging the fabric,

B. axle support means connected to the axle and rotatable about a support axis transverse to the fabric plane,

C. linear drive means connected to said apparatus and to said axle support means for displacing said friction wheel along a displacement axis transverse to the reference line and parallel to the fabric plane, and



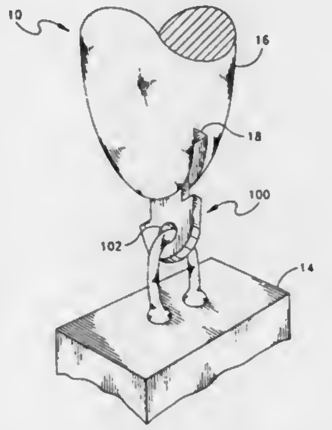
D. means connected to said axle support means and to said apparatus for rotating said axle support means about the support axis relative to said linear drive means in response to displacement of said friction wheel along the displacement axis by said linear drive means.

5,462,000
NON-TURBULENT PULL DOWN EYE FOR BUOYANT TEST VEHICLE

William H. Nedderman, Jr., Middletown, and Robert Meunier, Portsmouth, both of R.I., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 21, 1994, Ser. No. 360,475
Int. Cl.⁶ B63B *21/58*

U.S. Cl. 114—249 **14 Claims**



1. A retractable pull-down eye device comprising:

an open housing having an inner surface forming an opening therethrough generally along a centerline of the housing, the housing having an exterior surface;

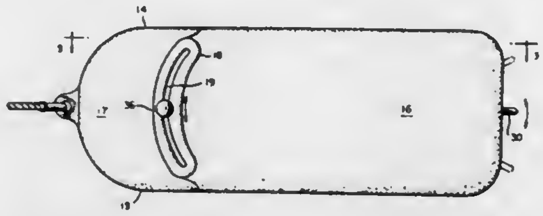
an eye portion having an eye aperture therethrough, the eye portion being movable between a retracted position wherein said eye portion is recessed within the opening, an outer surface of the eye portion being flush with the exterior surface of the housing, and an extended position wherein the eye portion projects out of the opening and the eye aperture is accessible for connection of a pull-down device;

a body portion affixed to the eye portion remote from the outer surface, the body portion being within the opening for retaining the device within the housing; and

a biasing means within the opening for resisting movement of the eye portion from the retracted position to the extended position and for providing a force to return the eye portion to the retracted position.

5,462,001
TOWED WATERCRAFT AND STEERING METHOD

Jerome H. Lemelson, P.O. Box 5076, Incline Village, Nev. 89450
Filed Nov. 22, 1994, Ser. No. 346,199
Int. Cl.^{6} B63B ***21/04***
U.S. Cl. 114—253 **20 Claims**



1. A watercraft operable to be towed behind a powered boat comprising:

(a) a craft body configured to receive and provide floatation for at least one human being;

(b) an upper surface of said craft body configured to permit a human being to be supported thereon in a lying position, facing forward when the watercraft is operatively towed in water;

(c) a steering mechanism supported by said craft body and including at least one steering rudder located along the length of said body and extending beneath said body, and mechanical means including a connecting rod extending through said body and connected to said rudder for varying the angle of said rudder with respect to a longitudinal axis of said water craft in a manner to permit a person riding said watercraft to controllably seer said watercraft;

(d) said steering mechanism including a steering handle moveable in an arc to the left and right of said longitudinal axis to move said connecting rod for varying the angle of said rudder; and

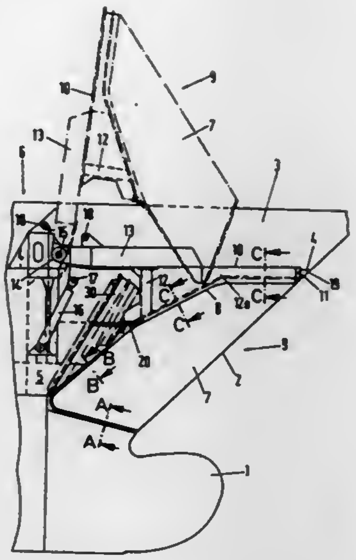
(e) means including a towing line secured to said watercraft and extending to a powered boat for towing said watercraft through the water behind said boat wherein said steering mechanism may be manually operated to cause the towed watercraft to move to the left or right in the water within and beyond the wake of said powered boat.

5,462,002
SHIP, ESPECIALLY A FERRY, WITH A BOW DOOR

Heinz Wendt, and Bruno Pataj, both of Bremen, Germany, assignors to Macor Marine Systems International GmbH, Bremen, Germany
PCT No. PCT/EP93/01119, § 371 Date Apr. 11, 1994, § 102(e) Date Apr. 11, 1994, PCT Pub. No. WO94/00331, PCT Pub. Date Jan. 6, 1994
PCT Filed May 7, 1993, Ser. No. 196,138
Claims priority, application Germany, Jun. 24, 1992, 42 20 435.6
Int. Cl.^{6} B63B ***35/40***
U.S. Cl. 114—260 **6 Claims**

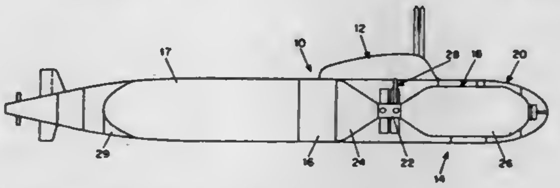
1. A ship, in particular a ferry, having a bow door, which includes a part of a ship's hull in a bow region, which can be upwardly tilted around a horizontally extending axis and encloses a portion of a stem of the ship, and comprises two parts of side walls of the ship's hull cut out on either side of the stem beneath a foredeck of the ship; and

the bow door additionally comprising a first portion of the foredeck lying over the parts of the side walls, and the parts of the side walls and the first portion of the foredeck being joined to one another with associated portion of the stem to form an integral ship's hull insert, the ship's hull insert being swivelled out of a closed position through a section defined by the first portion of the foredeck into an open position substantially above the foredeck.



5,462,003
MINIMUM DISPLACEMENT SUBMARINE ARRANGEMENT

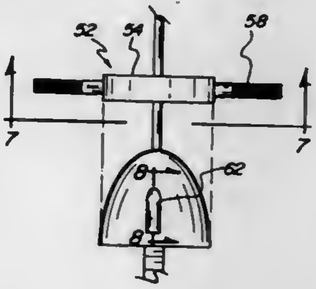
Robert F. Fox, Westerly, R.I., and Peter D. Canning, Stonington, Conn., assignors to General Dynamics Corporation, Falls Church, Va.
Filed Apr. 4, 1994, Ser. No. 222,536
Int. Cl.^{6} B63G ***8/28***
U.S. Cl. 114—316 **13 Claims**



1. A minimum displacement submarine comprising a body with forward and aft portions, the forward portion comprising an inner hull and outer hull, the inner hull being formed with a wasp waist, a extending over the forward portion fairwater extending over the forward portion, and a vertical tube between the wasp waist and fairwater.

5,462,004
EMERGENCY WARNING FLAG SYSTEMS

Clayton E. McGlothin, P.O. Box 71, Mt. Sterling, Ky. 40353
Filed Dec. 10, 1993, Ser. No. 164,533
Int. Cl.^{6} B60Q ***7/00;*** **E01F** ***9/10;*** **A45F** ***3/44;*** **G09F** ***15/00***
U.S. Cl. 116—63 R **2 Claims**



2. An emergency warning flag system adapted to mark areas for use by emergency vehicles comprising:

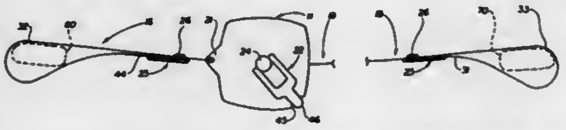
- a vertically extending, elongated flag pole having an upper end and a lower end with a hole;
- a flexible flag secured with respect to the upper end of the flag pole;
- a base unit formed generally in the shape of an inverted truncated cone with a vertical slot extending through the upper extent of the cone;
- attachment means extending downwardly from the base unit for securement to a ground surface;
- a pin extending horizontally through the hole in the lower end of the flag pole and secured into the base unit at a central extent of the vertical slot;
- a spring adapted to secure the flag pole in a vertical orientation during normal operation and use of warning motorists not to park thereadjacent the flag pole and the spring being pivotable about the pin wherein the flag pole is movable to a generally horizontal orientation when hit by a vehicle moving in contact with the pole; and
- a tool formed with a central ring-like member with projections extending radially inwardly and with handles extending radially outwardly, the projections adapted to releasably contact associated recesses in the base unit to facilitate the screwing in and screwing out of the base unit with respect to the ground surface.

5,462,005

METHOD AND APPARATUS FOR RESERVING SEATS AT ENTERTAINMENT EVENT

Edward J. Finger, 7696 E. El Rancho, Scottsdale, Ariz. 85260
Filed Dec. 6, 1993, Ser. No. 161,597
Int. Cl.^{6} G09F *7/20*

U.S. Cl. 116—200 **6 Claims**



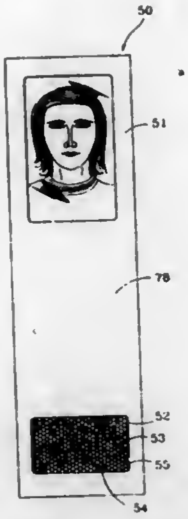
1. A tape unit for reserving a plurality of seats at an entertainment event, said tape unit including
- (a) a hollow casing;
- (b) a tape having a distal end and a proximate end;
- (c) spool means for supporting said tape when said tape is coiled, said spool means mounted within said casing and attached to said proximate end of said tape;
- (d) means for retracting said tape into said casing and winding said tape in a coil upon to said spool means;
- (e) indicia on said tape denoting that seats over which said tape is extended are reserved;
- (f) means for looping said distal end around a first seat armrest; and,
- (g) means for securing said casing to a second seat armrest such that said tape is horizontally oriented and extends over a plurality of seats, said tape unit being shaped and dimensioned to be carried on a person.

5,462,006

BOOKMARK

Devaraj Thiruppathi, 4825 Beverly Ave., NE., Canton, Ohio 44714
Continuation-in-part of Ser. No. 251,975, Jun. 1, 1994, abandoned, and a continuation-in-part of Ser. No. 209,079, Mar. 11, 1994, abandoned. This application Dec. 2, 1994, Ser. No. 348,714
Int. Cl.^{6} B42D *9/00*

U.S. Cl. 116—234 **17 Claims**



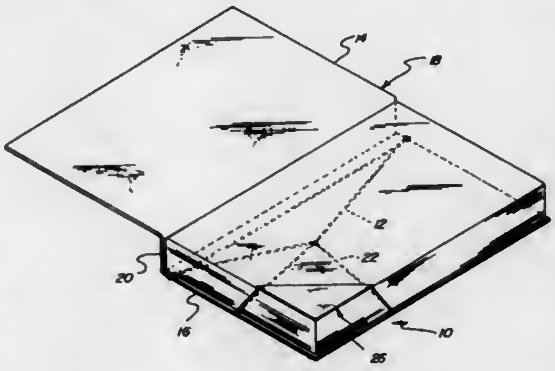
1. A bookmark comprising:
front and rear plates;
an opening formed in said front plate; and
attachment means attaching the front and rear plates in juxtaposition except along the periphery of the front plate opening to form a pocket for receiving a photograph therein and forming a top opening for inserting the photograph into the pocket, wherein the pocket has a cavity formed between said front and rear plates and extending around the periphery of said opening except for said top opening, for receiving edges of the photograph in said cavity to retain said photograph within said pocket; fragrance emanating means for emanating a fragrance positioned adjacent the rear plate; and access means for permitting air to flow over the fragrance emanating means.

5,462,007

BOOKMARK

Leslie K. Prescott, 612 Newton Ave., Uniondale, N.Y. 11553
Filed Aug. 18, 1994, Ser. No. 292,385
Int. Cl.^{6} B42D *9/00*

U.S. Cl. 116—239 **4 Claims**



1. A bookmark comprising:
- a mounting band which may be secured about a cover of a book, said mounting band comprising a circular length material which can be resiliently deformed;
- a positioning band, said positioning band comprising a circular length material which can be resiliently deformed;
- connecting means for coupling said positioning band to said mounting band, said connecting means comprising a knot formed of intertwined portions of both said mounting band and said positioning band;
- a marker member mounted to said positioning band, said marker member being operable to be positioned on top of a page of said book to be marked whereby said marked page and pages between said marked page and a portion of said cover are removably joined together for storage;

said marker member comprising a main body having a retaining flap which extends about the positioning band, said retaining flap being secured about said positioning band to said main body by a securing means, said positioning band being free to move through a cavity defined between said retaining flap and said main body of said marker member; and

said marker member being formed from a blank, said blank comprising said main body with said main body having a pair of main body edges oriented at a right angle to define a corner point positionable in alignment with a corner of said page to be marked, said main body edges intersecting orthogonally oriented lateral edges cooperating with a top edge of the marker blank to define said retaining flap with a weakened fold line extending from a first intersection of a first of said lateral edges and a first of said main body edges to a second intersection of a second of said lateral edges and a second of said main body edges such that said retaining flap can be folded over said positioning band.

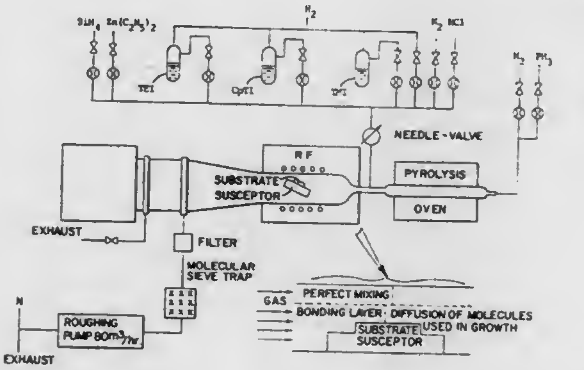
5,462,008
SEMICONDUCTOR FILMS

Manijeh Razeghi, Evanston, Ill., assignor to Northwestern University, Evanston, Ill.

Division of Ser. No. 293,903, Aug. 22, 1994, Pat. No. 5,410,178. This application Dec. 12, 1994, Ser. No. 354,225

Int. Cl.^{6} H01L *21/20*

U.S. Cl. 117—2 **10 Claims**



1. A method for the preparation of a III–V film for use in long wavelength infrared detectors and lasers comprising the steps of:

a) preparing an InP substrate in a temperature of about 470°°C.–540° C. and pressure of 70–80 Torr;

b) growing an epilayer of InP on said substrate at said temperature and pressure;

c) and flowing cyclopentadienyl thallium over the InP epilayer while maintaining said temperature and pressure, thereby forming the III–V film of $(InP)_{1-x}(TlP_3)_x$ where $0.1 \leqq X \leqq 0.9$.

5,462,009
METHOD AND APPARATUS FOR PRODUCING PEROVSKITE COMPOSITIONS

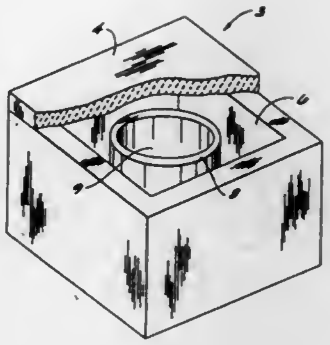
Darryl F. Garrigus, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Nov. 6, 1992, Ser. No. 973,169

Int. Cl.^{6} C30B *1/10*

U.S. Cl. 117—7 **17 Claims**

1. A method for producing a perovskite composition from a precursor composition comprising placing perovskite seed material in contact with the precursor composition and irradiating the seed material and the precursor composition with microwaves to heat the seed material and the precursor composition and convert said precursor composition to perovskite.



5,462,010
APPARATUS FOR SUPPLYING GRANULAR RAW MATERIAL FOR A SEMICONDUCTOR SINGLE CRYSTAL PULLING APPARATUS

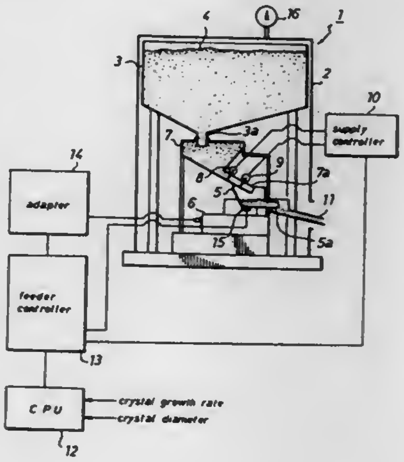
Kiyotaka Takano; Izumi Fusegawa; Hirotoshi Yamagishi; Koji Mizuishi, and Katsuhiko Ogino, all of Gunma, Japan, assignors to Shin-Etsu Handotai Co., Ltd., Japan

Filed Oct. 14, 1992, Ser. No. 961,182

Claims priority, application Japan, Jan. 15, 1991, 3-293808

Int. Cl.^{6} C30B *15/02*

U.S. Cl. 117—14 **10 Claims**



1. An apparatus for continuously supplying granular raw material to a crucible installed in a semiconductor single crystal pulling apparatus, said supplying apparatus comprising a vacuum chamber, a funnel-shaped tank having a relatively large capacity, a main hopper installed below said tank and having a relatively small capacity, a vibration feeder on which said main hopper is mounted and which is adapted to vibrate said main hopper, a subhopper having an intermediate capacity and providing a passage from said tank to said main hopper and being equipped with at least one valve for closing and opening its outlet tube disposed in said main hopper, a weight sensor for detecting the weight of said main hopper, a control means for controlling the operation of said vibration feeder in response to a detection signal received from said weight sensor indicating the weight of said main hopper, and a power source for supplying electric power.

5,462,011
METHOD FOR PULLING SINGLE CRYSTALS

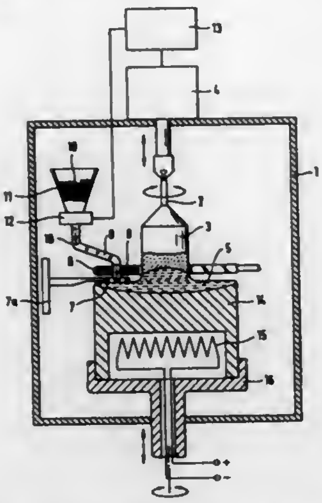
Erich Tomzig, Burgkirchen; Reinhard Wolf, Emmerting, and Wolfgang Hensel, Burghausen, all of, Germany, assignors to Wacker-Chemitronic Gesellschaft für Elektronik-Grundstoffe mbH, Burghausen, Germany

Filed May 25, 1994, Ser. No. 248,753

Claims priority, application Germany, Jun. 1, 1993, 43 18 184.8

Int. Cl.^{6} C30B *15/20*

U.S. Cl. 117—18 **8 Claims**



1. A method of pulling a single crystal of silicon, comprising generating a molten pool of silicon on the top of a pedestal-shaped support body;

heating the molten pool with an induction coil, said molten pool being held on the top of the support body by the surface tension of silicon and by the electromagnetic forces of said induction coil;

dipping a silicon seed crystal into the molten pool;

raising the seed crystal in a controlled manner in the vertical direction with respect to the molten pool, so as to grow a single crystal of silicon on the seed crystal; and

recharging the molten pool with silicon material in a state selected from the group consisting of solid state and liquid state during the growth of the single crystal.

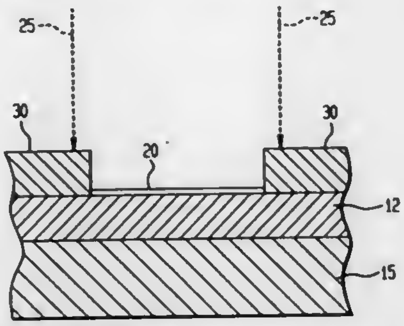
5,462,012
SUBSTRATES AND METHODS FOR GAS PHASE DEPOSITION OF SEMICONDUCTORS AND OTHER MATERIALS

Tien-Heng Chiu, Spotswood, N.J., assignor to AT&T Corp., Murray Hill, N.J.

Filed Nov. 29, 1994, Ser. No. 346,444

Int. Cl.^{6} C30B *23/04*

U.S. Cl. 117—85 **9 Claims**



1. A process measuring the temperature of a substrate for semiconductor growth comprising:

a) providing a substrate having a temperature monitoring zone of growth preventing material; and

b) measuring the temperature of the substrate by viewing an area thereof using an optical pyrometer, the viewed area including at least a portion of the temperature monitoring zone.

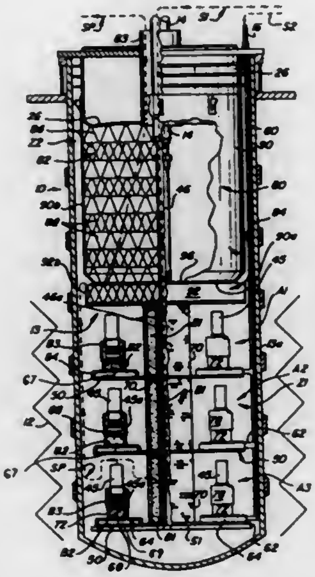
5,462,013
CVD APPARATUS AND METHOD FOR FORMING UNIFORM COATINGS

David C. Punola, Muskegon; William C. Basta, Montague, and Jeffery S. Smith, Muskegon, all of Mich., assignors to Howmet Corporation, Greenwich, Conn.

Division of Ser. No. 802,257, Dec. 4, 1991, Pat. No. 5,264,245. This application Oct. 26, 1993, Ser. No. 143,455

Int. Cl.^{6} C23C *16/00*

U.S. Cl. 118—719 **19 Claims**



1. Chemical vapor deposition apparatus, comprising:

a) a reactor having a chamber at elevated temperature,

b) means for supporting substrates to be coated at a plurality of different coating zones in the chamber,

c) means for supplying a gaseous reactant stream to the chamber for distribution to the coating zones, and

d) reactivity-altering material disposed at the coating zones for contact by the reactant stream supplied thereto before said reactant stream contacts a substrate thereat, said material having a composition that is different between coating zones having substantially different reactant stream temperatures so as to alter the reactivity of the reactant stream at said zones in a manner to provide substantially the same reactant stream reactivity at said coating zones.

5,462,014
APPARATUS FOR GROWING A THIN METALLIC FILM

Nobuyoshi Awaya, Isehara, and Yoshinobu Arita, Atsugi, both of, Japan, assignors to Nippon Telegraph and Telephone Corporation, Tokyo, Japan

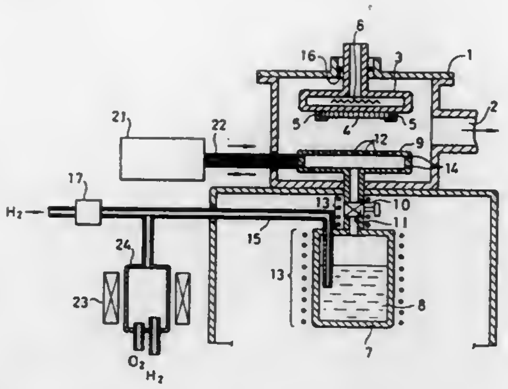
Division of Ser. No. 665,610, Mar. 7, 1991, Pat. No. 5,316,796. This application Feb. 23, 1994, Ser. No. 200,655

Claims priority, application Japan, Mar. 9, 1990, 2-56586; Jan. 15, 1990, 2-273274

Int. Cl.^{6} C23C *16/00*

U.S. Cl. 118—725 **2 Claims**

2. An apparatus for growing a thin metallic film, comprising: a reaction chamber capable of being evacuated;



substrate holding means for holding and heating a substrate, said substrate holding means being provided in said reaction chamber;

a starting material container for containing a starting material;

burning means for burning hydrogen with oxygen to produce steam;

gas ejecting means having gas ejecting orifices for ejecting a vapor of said starting material together with a reducing gas and said steam, said gas ejecting means being connected to said starting material container and said burning means; and

heat exchanging means for circulating a heat exchange medium to the proximity of said gas ejecting orifices of said gas ejecting means.

5,462,015

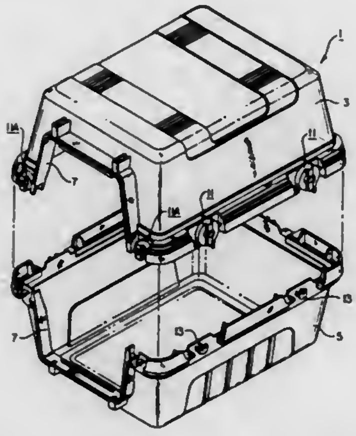
KENNEL HULL LATCH

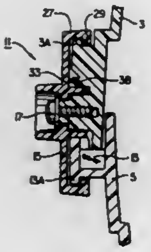
Thomas B. Murphy, Arlington, Tex., assignor to Doskocil Manufacturing Co. Inc., Arlington, Tex.

Filed Jun. 1, 1994, Ser. No. 252,420

Int. Cl.⁶ A01K *1/03*

U.S. Cl. 119—19 **12 Claims**





1. An improved latch for securing together two portions of an enclosure, said latch comprising:

a rotary latch member secured to a first of said portions of said enclosure, said latch member including a generally circular disk having an annular wall formed about the periphery thereof, said annular wall having an interruption therein and an annular recess formed in said annular wall and facing interiorly of said annular wall, said latch member being rotatable between locked and unlocked positions;

means for rotatably coupling said latch member to a first of said portions, said coupling means including a mounting lug extending from said first portion and having an external shoulder for engagement with said annular recess in said annular wall of said latch member;

a lug formed on a second of said portions of said enclosure;

wherein, upon assembly of said two portions, said lug is received interior of said annular wall through said interruption therein and said latch member is selectively rotated to said locked position to confine said lug within said annular wall, thus securing together said two portions;

a stop member extending from one of said upstanding walls and generally adjacent said periphery of said disk, said stop member including a locking aperture;

a locking lug extending outwardly from said annular wall of said latch member and generally tangentially to said periphery of said disk, said locking lug cooperating with said stop member in said locked position to limit rotational movement of said latch member; and

an aperture through said locking lug registering with said locking aperture in said stop member to permit said latch member to be secured against rotation in said locked position in which said two portions are secured together.

5,462,016

Patent Not Issued For This Number

5,462,017

POULTRY FEEDER

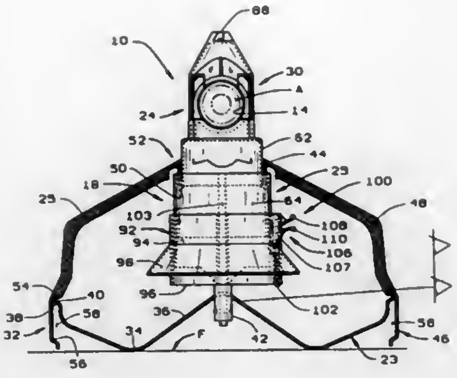
Eugene B. Pollock, Assumption, and Jeffrey L. Knollenberg, Taylorville, both of Ill., assignors to Grain Systems, Inc., Assumption, Ill.

Continuation-in-part of Ser. No. 991,383, Dec. 15, 1992, Pat. No. 5,311,839. This application Sep. 24, 1993, Ser. No. 126,238

Int. Cl.⁶ A01K *39/01*

U.S. Cl. 119—57.4 **23 Claims**

1. A poultry feeder to be installed on a feed conveyor, the latter comprising a feed conveyor conduit through which feed is conveyed to one or more of said feeders, said feeder comprising a feed pan, a drop tube in communication with said feed conveyor conduit for receiving feed therefrom and for depositing said feed in



said feed pan, means for supporting said feed pan, and means for adjusting said feed pan between a shallow depth pan position in which the depth of said feed pan facilitates a young chick to readily see feed deposited in said feed pan and a deep depth pan position in which the depth of the pan is such that an older bird may readily eat feed from said feed pan, but is impeded from raking or billing feed out of said feed pan.

5,462,018

BRUSHING DEVICE FOR GROOMING ANIMALS

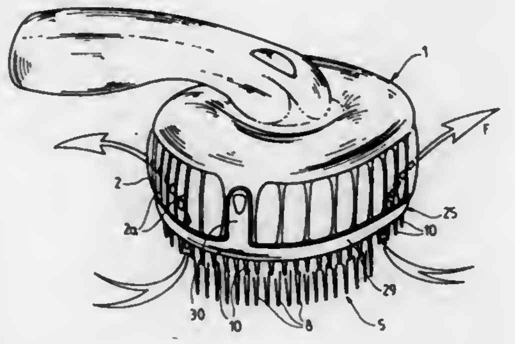
Bernard Louison, Chavanay, France, assignor to SEB S.A., Selongey Cedex, France

Filed Nov. 30, 1993, Ser. No. 158,738

Claims priority, application France, Nov. 30, 1992, 92 14603

Int. Cl.^{6} A01K *13/00*

U.S. Cl. 119—86 **21 Claims**



1. Manually operable grooming device for animal coats, said device comprising:
a main body;
scratching means for scratching an animal's coat carried by said main body and comprising a support member and a plurality of scratching teeth carried by, and extending from, said support member, said scratching teeth having free ends which define a scratching surface;
a removable screen penetrated by at least a portion of said scratching teeth for recovering animal fur from between said scratching teeth; and
suction means mounted in said main body behind said scratching surface for producing an air flow along a path adjacent said scratching means and in a direction from said scratching surface toward said support member,
wherein said screen extends across a surface which is spaced from said scratching surface and includes an annular portion which surrounds said scratching teeth, is free of teeth, and is in the path of the air flow.

5,462,019

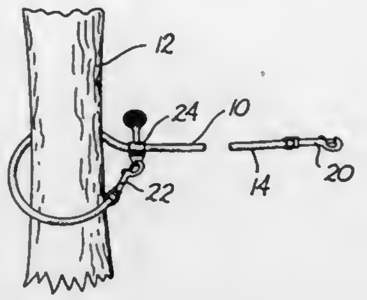
ANIMAL LEASH

Shiau Hong-Rong, 29595 Colony Cir., Farmington Hills, Mich. 48334, and Ching S. Chen, No.220, Ta Pu Rd., Changha City, Taiwan, Prov. of China

Filed Sep. 20, 1994, Ser. No. 309,428

Int. Cl.^{6} A01K *27/00*

U.S. Cl. 119—795 **1 Claim**



1. A dog leash comprising:
an elongated flexible cable (14) having a generally uniform cross section along its length;
said cable having first and second ends; each of said ends of the cable comprising a loop (16);
a snap-type connector permanently attached to each of said loops;
each of said snap-type connectors comprising an open-ended hook element (26), a spring-biased latch pin (30) moveable to close or open the hook element, and a ring (33) having a swivel connection to said hook element;
each of said rings (33) extending through one of said loops, whereby each respective snap connector can swivel around the cable while remaining attached to the cable;
a clamp connector means (24) slideably mounted on said cable for adjusting movements therealong;
said clamp connection means comprising a clamp body having a bore (34) slideably encircling the cable so that the clamp body is retained against removal from the cable while being slidable therealong;
said clamp body having an integral tab formed with an opening that defines an eyelet (48) offset from said bore (34), whereby the eyelet is accessible in any adjusted position of said clamp body;
said clamp connection means further comprising a threaded opening (36) intersecting said bore so that the axis of the threaded opening is at right angles to the bore axis;
and a manually operable set screw (38) threaded into said opening, said set screw having one end engageable with the cable to clamp the cable against an internal surface of the bore;
said set screw being manually rotatable so that said one end of the screw is released from the cable, whereby said clamping connection means is than freely slidable on the cable;
said flexible cable being adapted to be wound around a tree, with the hook element (26) on one of said snap type connectors extending through said eyelet (48) and said set screw (38) clamped against the cable, whereby the cable forms a noose of fixed circumferential length freely encircling the tree without tightening on the tree surface, such that a dog restrained by the leash is enabled to move around the three without causing the cable to pull the dog toward the tree.

5,462,020

ANIMAL TAIL COVER

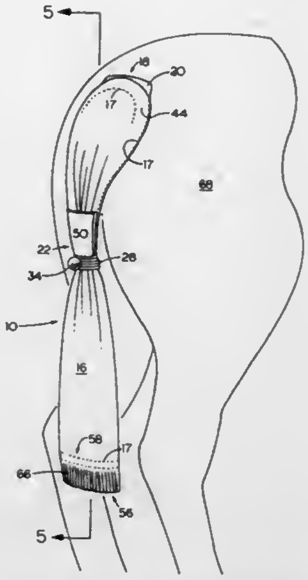
Charleen R. Trimmer, P.O. Box 100, Jacksonville, Oreg. 97530

Filed Apr. 28, 1994, Ser. No. 234,850

Int. Cl.^{6} A01K *13/00*

U.S. Cl. 119—850 **21 Claims**

1. A cover for use on the tail of an animal, the cover comprising:



an elongate cover for at least partially enclosing the tail, and having an opening for receiving the tail therethrough;

a fastener operatively connected to the elongate cover for gripping the tail at a point below the dock of the tail, thereby holding the elongate cover to the tail; and

a reinforcement structure operatively connected to the elongate cover for holding the opening above the fastener, wherein the reinforcement structure includes a vertical support extending upwardly from the fastener for supporting the opening relative to the fastener.

5,462,021

HYDROGEN GAS SUPPLY SYSTEMS FOR HYDROGEN ENGINE AND METHOD OF SUPPLYING HYDROGEN GAS TO THE HYDROGEN GAS SUPPLY SYSTEM

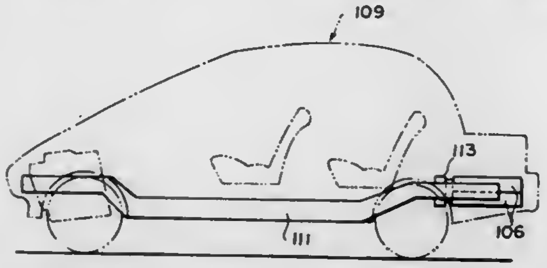
Takanori Minami; Noriaki Shiraishi; Tsutomu Shimizu; Kenji Takamuku; Yoshinori Tsushio; Yoshio Mizushima; Kazuyuki Yoshimoto, and Masaki Kadokura, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Continuation of Ser. No. 29,067, Mar. 10, 1993, abandoned. This application Jul. 5, 1994, Ser. No. 270,305

Claims priority, application Japan, Mar. 12, 1992, 4-090012; May 15, 1992, 4-148526

Int. Cl.^{6} F02B *43/08*

U.S. Cl. 123—3 **23 Claims**



1. A hydrogen gas supply system for a hydrogen engine comprising a hydrogen gas cartridge having a casing in which hydrogen gas storage alloy and a heating medium passage for heating the hydrogen gas storage alloy are housed, a hydrogen gas supply passage which leads hydrogen gas discharged from the hydrogen gas cartridge to the engine, a heating medium supply passage which supplies heating medium to the heating medium passage in the hydrogen gas cartridge and a heating medium return passage through which the heating medium flows out of the hydrogen gas cartridge is returned, characterized in that

the hydrogen gas cartridge is provided with a hydrogen gas takeout port through which the hydrogen gas discharged from the hydrogen gas storage alloy is taken out, a heating medium inlet through which the heating medium supplied from the heating medium supply passage flows into the heating medium passage and a heating medium outlet through which the heating medium flowing into the heating medium passage flows out of the hydrogen gas cartridge,

and the hydrogen gas cartridge is detachably attached to the engine with the hydrogen gas takeout port, the heating medium inlet and the heating medium outlet being respectively connected to and disconnected frown the hydrogen gas supply passage, the heating medium supply passage and the heating medium return passage in response to attachment and detachment of the hydrogen gas cartridge;

wherein a plurality of first joint portions are connected to said hydrogen gas supply in parallel to each other by way of branch passages, each of the first joint portions being adapted to be connected with the hydrogen gas takeout port of the hydrogen gas cartridge and a plurality of said hydrogen gas cartridges are attached to the engine with the hydrogen gas takeout port of each hydrogen gas cartridge connected to one of the first joint portions of the hydrogen gas supply passage.

5,462,022

VALVE TIMING CONTROL APPARATUS HAVING CYLINDER DISCRIMINATING FUNCTION

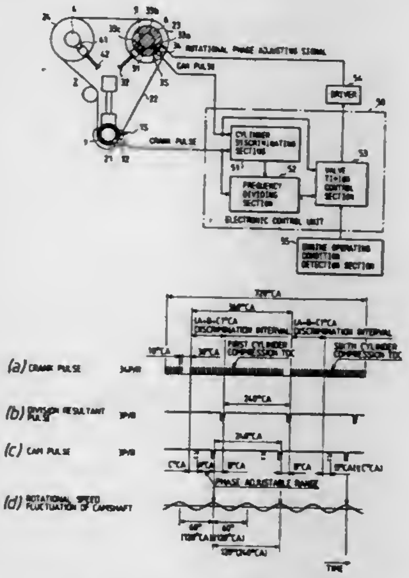
Masayasu Ushida, Chiryu, Japan, assignor to Nippondenso Co., Ltd., Japan

Filed Nov. 29, 1994, Ser. No. 348,185

Claims priority, application Japan, Nov. 29, 1993, 5-298514

Int. Cl.^{6} F01L *1/34*

U.S. Cl. 123—90.17 **6 Claims**


ROTATIONAL PHASE ADJUSTING SIGNAL
CAM PULSE
DRIVER
CRANK PULSE
CYLINDER DISCRIMINATING SECTION
FREQUENCY DIVIDING SECTION
VALVE TIMING CONTROL SECTION
ELECTRONIC CONTROL UNIT
ENGINE OPERATING CONDITION DETECTION SECTION
DISCRIMINATION INTERVAL
DISCRIMINATION INTERVAL
FIRST CYLINDER COMPRESSION TDC
SIXTH CYLINDER COMPRESSION TDC
(a) CRANK PULSE
(b) DIVISION RESULTANT PULSE
(c) CAM PULSE
(d) ROTATIONAL SPEED FLUCTUATION OF CAMSHAFT
PHASE ADJUSTABLE RANGE
TIME

6. An apparatus for an engine having cylinders, a rotatable crankshaft, a rotatable camshaft, and means for rotating the camshaft in response to rotation of the crankshaft, the apparatus comprising:

means for adjusting a relative rotational phase difference between the crankshaft and the camshaft in a predetermined adjustment angular range;

means for setting a predetermined discrimination angular interval with respect to an angular position of the crankshaft, the discrimination angular interval being longer than the adjustment angular range and shorter than an angle of 360° of the crankshaft;

means for generating a cam pulse signal when the camshaft reaches a predetermined angular position;

means for determining whether or not the cam pulse signal occurs in the discrimination angular interval; and

means for detecting which of the cylinders falls into a specified point of its operation cycle in response to a result of said determining by the determining means.

5,462,023

RAIN COVER OF AN IGNITION PLUG ATTACHING HOLE

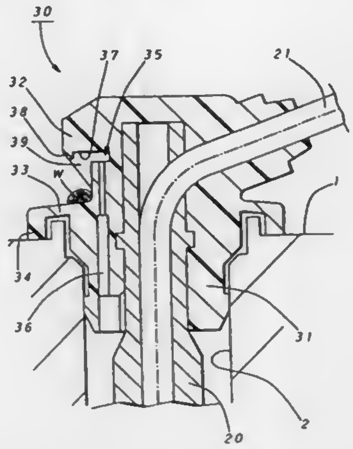
Yoshinobu Furuya, Shizuoka, Japan, assignor to Yazaki Corporation, Tokyo, Japan

Filed Oct. 12, 1994, Ser. No. 321,919

Claims priority, application Japan, Jan. 13, 1993, 5-060002 U

Int. Cl.⁶ H01T *13/06*

U.S. Cl. 123—143 C **9 Claims**



1. A rain cover of an ignition plug attaching hole comprising:

a cover body fitted in an ignition plug attaching hole formed in an engine head, said cover body liquid-tightly sealing said ignition plug attaching hole;

a vent hole formed in said cover body for communicating a space formed in said ignition plug attaching hole with the atmosphere; and

a flange portion perpendicularly provided to said cover body so that said flange portion comes into contact with an outer surface of said engine head,

wherein a wall surface is perpendicularly provided on a surface of said cover body on the atmosphere side, said wall surface being opposed to a surface of said flange portion on the atmosphere side and extending outside in a radial direction perpendicular to an axis of said ignition plug attaching hole, and an opening of said vent hole on the atmosphere side is closely disposed facing said wall surface.

5,462,024

AUXILIARY CARBURETION DEVICE IN DIRECT FUEL INJECTION ENGINES

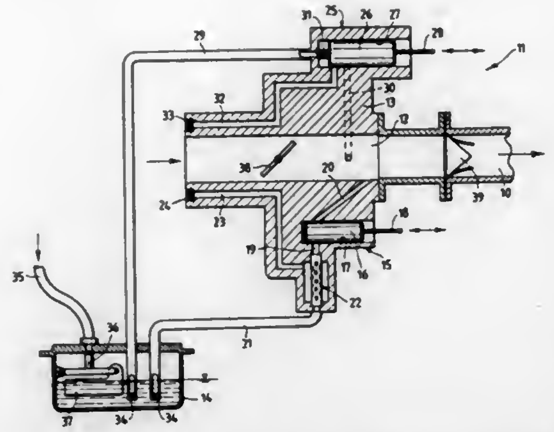
Marco Nuti, Pisa, Italy, assignor to Piaggio Veicoli Europei S.p.A., Italy

Filed Dec. 20, 1993, Ser. No. 169,219

Claims priority, application Italy, Dec. 23, 1992, MI92A2945

Int. Cl.⁶ F02M *1/04;71/04;17/04*

U.S. Cl. 123—179.14 **16 Claims**



1. An auxiliary carburetion device for utilization with direct fuel injection engines which include a main duct (12) for feeding air to an engine crankcase (10) under the control of a throttling member (38) in the main duct (12) comprising first (15, 42, 50) and second (25) regulating valve means associate with respective first (19, 20, 21; 20, 21, 40, 44; 19, 20, 21, 49, 54) and second (29, 30) duct means for controlling the flow of fluid therethrough, a vessel (14; 45, 51) containing a constant predeterminable amount of fuel, said first duct means being disposed in fluid communication between said vessel and said main duct, said second duct means being disposed in fluid communication between said vessel and said main duct, said first and second regulating valve means includes respective first (16) and second (26) piston means for imparting exterior control to said respective first and second regulating valve means, air duct means (32) in fluid communication with said second duct means, and fluid flow through said air duct means being controlled by said second regulating valve means.

5,462,025

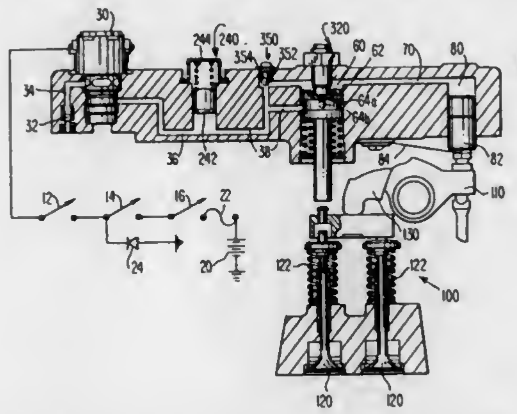
HYDRAULIC CIRCUITS FOR COMPRESSION RELEASE ENGINE BRAKES

Mark Israel, Amherst, Mass., and Neil E. Fuchs, New Hartford, Conn., assignors to Diesel Engine Retarders, Inc., Wilmington, Del.

Filed Sep. 28, 1994, Ser. No. 314,413

Int. Cl.⁶ F02D *13/04*

U.S. Cl. 123—321 **19 Claims**



1. In a compression release engine brake having a hydraulic circuit that includes a master piston reciprocable in a master piston cylinder in response to a mechanical input from an internal combustion engine associated with the engine brake, a slave piston reciprocable in a slave piston cylinder in response to hydraulic fluid flow in said hydraulic circuit from said master piston cylinder to said slave piston cylinder, and a conduit for supplying hydraulic fluid at a relatively low pressure while operation of the engine brake is desired, the improvement comprising:

means for allowing hydraulic fluid to flow from said conduit through an aperture in said slave piston to said slave piston cylinder whenever hydraulic fluid pressure in said conduit is substantially greater than hydraulic fluid pressure in said slave piston cylinder in order to fill and refill said slave and master piston cylinders with hydraulic fluid.

5,462,026

THROTTLE VALVE ASSEMBLY WITH TRACTION CONTROL DEVICE

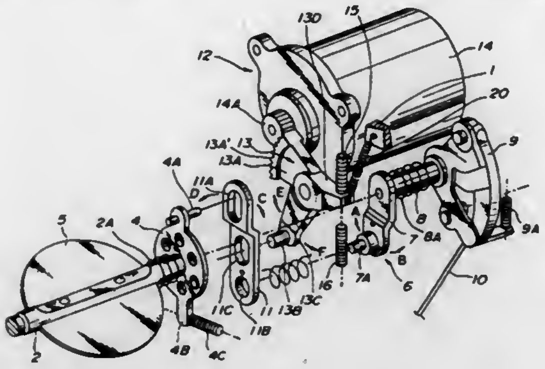
Masato Kumagai, Atsugi, Japan, assignor to Unisia Jecs Corporation, Atsugi, Japan

Filed Nov. 30, 1994, Ser. No. 351,075

Claims priority, application Japan, Feb. 9, 1994, 6-036593

Int. Cl.⁶ F02D *7/00*

U.S. Cl. 123—396 **14 Claims**



1. A throttle valve assembly comprising:

a body defining an air intake passage therein;

a valve proper pivotally installed in said air intake passage to control the amount of air flowing therethrough;

a first valve actuator for pivoting said valve proper in accordance with a first information;

a second valve actuator for pivoting said valve proper in accordance with a second information, said second valve actuator having a rest condition wherein the function of the second valve actuator is fully lost; and

first means for forcing the second valve actuator to take said rest condition when said second valve actuator gets out of order.

5,462,027

INDUCTION SYSTEM FOR ENGINE

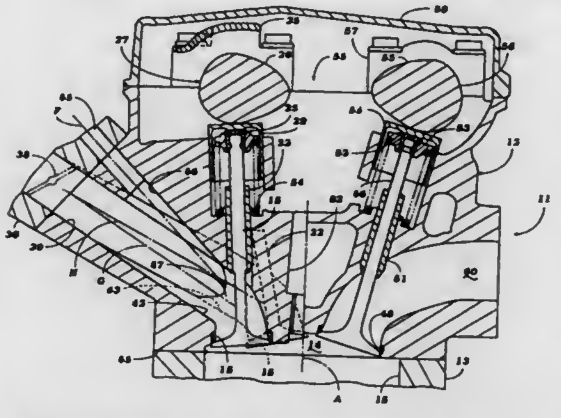
Tateo Aoyama, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Oct. 28, 1993, Ser. No. 144,713

Claims priority, application Japan, Jan. 28, 1992, 4-311116; Jan. 28, 1992, 4-311117

Int. Cl.⁶ F02B *17/00*

U.S. Cl. 123—432 **29 Claims**



1. A cylinder head and induction system for an internal combustion engine having a cylinder head assembly defining three intake valve seats all adapted to communicate with the same combustion chamber of the engine, at least one of said valve seats being of a different diameter than the other two of the valve seats, three poppet valves supported for reciprocation in said cylinder head and each controlling the flow through a respective one of said valve seats, intake port means formed in said cylinder head and terminating at each of said valve seats for delivering a charge to the associated combustion chamber, said intake valve seats, said intake valves and said intake port means being tuned so that each of said valve seats provides an intake flow to the combustion chamber that has optimum effect at a different engine speed.

5,462,028

FUEL PUMPING APPARATUS

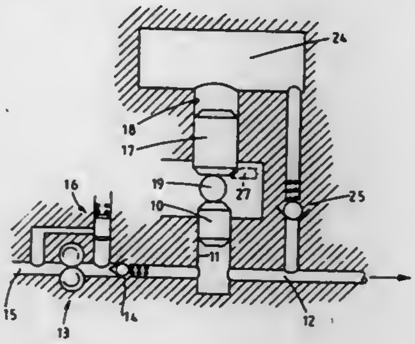
Paul Buckley, Rainham, England, assignor to Lucas Industries public limited company, Solihull, England

Filed Sep. 6, 1994, Ser. No. 301,174

Claims priority, application United Kingdom, Sep. 17, 1993, 9319283

Int. Cl.⁶ F02M *37/04*

U.S. Cl. 123—447 **9 Claims**



1. A fuel pumping apparatus for supplying fuel to an internal combustion engine comprising a pumping plunger movable in a bore, an outlet from one end of the bore, a valve through which fuel can flow into said one end of the bore and actuating means for moving the pumping plunger towards said one end of the bore to displace fuel through the outlet, said actuating means comprising a further plunger housed in a further bore, an accumulator volume connected to the inner end of the further bore, means operable to move the further plunger towards said inner end of the further bore thereby to pressurise fluid contained in the accumulator volume and means coupling the plungers whereby when the further plunger is allowed to move away from said inner end of the further bore under the action of fuel under pressure in the inner end of the further bore the pumping plunger will be moved inwardly toward said one end of the first mentioned bore to displace fuel through the outlet.

5,462,029

FUEL PUMPING APPARATUS

Stuart W. Nicol, London, England, assignor to Lucas Industries public limited company, West Midlands, United Kingdom

PCT No. PCT/GB92/02331, § 371 Date May 24, 1994, § 102(e) Date May 24, 1994, PCT Pub. No. WO93/13308, PCT Pub. Date Jul. 8, 1993

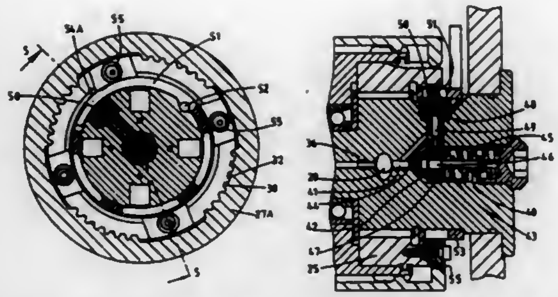
PCT Filed Dec. 16, 1992, Ser. No. 244,332

Claims priority, application United Kingdom, Dec. 20, 1991, 9127130; Mar. 20, 1992, 9206129

Int. Cl.⁶ F02M *41/14;59/36*

U.S. Cl. 123—450 **10 Claims**

1. A fuel pumping apparatus for supplying fuel to a multi cylinder internal combustion engine comprising a plurality of cam actuated pumping plungers (19) housed within respective bores (17) in a fixed body (10), the bores at their inner ends communicating with each other to form a pump working chamber (20), a cam member (25) having cam lobes (26) formed thereon for actuating the pumping plungers to displaced fuel from the pump working changer, a pump drive shaft (16) coupled to the cam



member (25), a plurality of outlets (22) formed in the body and which are connected to the injection nozzles respectively of the associated engine, valve means (19, 21) responsive to the rotation of the pump drive shaft through which fuel displaced from the pump working chamber (20) is supplied to the outlets (22) in turn during successive delivery periods said valve means (19) being housed in said body (10) and being interposed between the pump working chamber (20) and the outlets respectively, means (36) for supplying fuel to the pump working chamber (20) between said delivery periods, spill valve (40) operable to allow fuel to escape from said pump working chamber during the inward movement of the pumping plungers (19), a control valve (48) for controlling the operation of the spill valve and cam elements (55) movable relative to the control valve (48) for actuating the control valve.

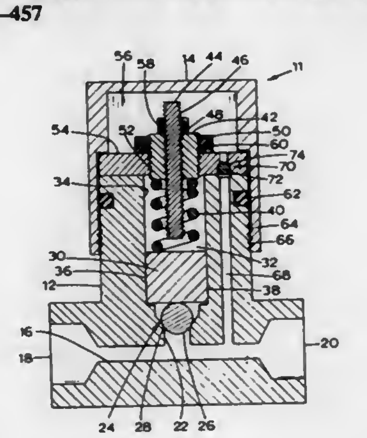
5,462,030
ENCAPSULATED ADJUSTABLE RATE SHAPING DEVICE FOR A FUEL INJECTION SYSTEM

Ronald D. Shinogle, Peoria, Ill., assignor to Caterpillar Inc., Peoria, Ill.

Filed May 31, 1994, Ser. No. 251,523

Int. Cl.^{6} F02M *37/04;* **F16K** *31/14;* **F02B** *3/00*

U.S. Cl. 123—457 **19 Claims**



13. A fuel injection control mechanism for split injection, comprising:

- an inlet orifice adapted for connection to a high pressure fuel line;
- an outlet orifice adapted for connection to a fuel injection nozzle;
- a main passage connecting the inlet orifice and the outlet orifice;
- a chamber having first and second ends;
- a check valve disposed between the main passage and the first end of the chamber;
- a piston stop disposed in the chamber;
- a piston slidably mounted within the chamber between the piston stop and the check valve;
- biasing means disposed between the piston and the second end of the chamber and exerting a force on the piston;
- means accessible from outside the chamber for allowing adjustment of the piston stop and the force exerted by the biasing means on the piston; and
- a removable cap enclosing the adjustment allowing means.

5,462,031
AIR-TO-FUEL RATIO CONTROL UNIT FOR INTERNAL COMBUSTION ENGINE

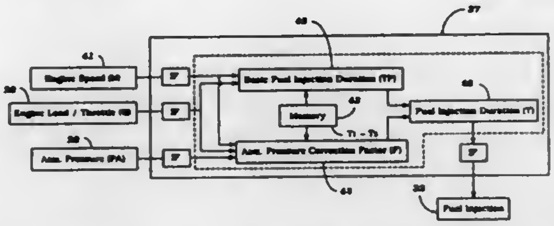
Manabu Kai, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Nov. 24, 1993, Ser. No. 157,884

Claims priority, application Japan, Nov. 24, 1992, 4-313342

Int. Cl.^{6} F02D *41/04*

U.S. Cl. 123—478 **40 Claims**


Engine Speed (N)
Engine Load / Throttle (θ)
Atm. Pressure (PA)
I/F
I/F
I/F
Basic Fuel Injection Duration (TP)
Memory
T1 - T3
Atm. Pressure Correction Factor (F)
Fuel Injection Duration (T)
I/F
Fuel Injection

1. An air/fuel ratio control for an internal combustion engine having a charge-forming device for supplying at least fuel to said engine for its operation, control means for controlling said charge-forming device to control the amount of fuel supplied to said engine by said charge-forming device, means for measuring at least two engine running conditions for determining a basic supply amount of fuel, said control means providing a richer fuel/air ratio as one of the speed and load of the engine increases to provide a richer fuel/air ratio than required to produce maximum power, means for measuring atmospheric pressure, and means for decreasing the amount of fuel supplied by said charge-forming device as the atmospheric pressure decreases with the amount of decrease of fuel supply being increased as the speed or load on the engine increases so as to provide a fuel/air ratio not greater than that required to produce maximum power.

5,462,032
FUEL INJECTION TIMING CONTROL DEVICE AND METHOD FOR INTERNAL COMBUSTION ENGINE

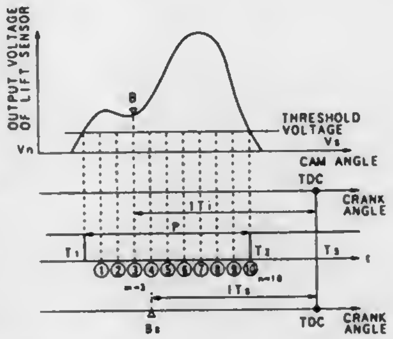
Hisashi Nakamura, Higashimatsuyama, Japan, assignor to Zexel Corporation, Tokyo, Japan

Filed Aug. 30, 1994, Ser. No. 297,842

Claims priority, application Japan, Sep. 7, 1993, 5-246424

Int. Cl.^{6} F02M *37/04;* **F02D** *1/02*

U.S. Cl. 123—501 **9 Claims**



1. A fuel injection timing control device for use in an internal combustion engine, including:

- sensor means for detecting a lift amount of a needle valve of a fuel injection nozzle;
- conversion means for converting an output signal of said sensor means to a rectangular wave using a predetermined threshold level; and
- ignition point calculating means for calculating a timing for actual fuel ignition on the basis of the rectangular wave in accordance with a driving condition of the internal combustion engine, wherein a fuel injection control is performed using the calculated ignition timing as a control target.

5,462,033

FUEL PUMPING APPARATUS

Christopher H. Best, Kent, England, assignor to Lucas Industries Public Limited Company, England

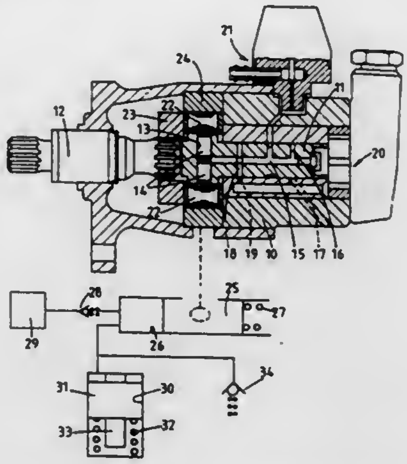
PCT No. PCT/GB93/00717, § 371 Date Aug. 2, 1994, § 102(e) Date Aug. 2, 1994, PCT Pub. No. WO93/21438, PCT Pub. Date Oct. 28, 1993

PCT Filed Apr. 6, 1993, Ser. No. 256,911

Claims priority, application United Kingdom, Apr. 9, 1992, 9207851; Aug. 12, 1992, 9217087

Int. Cl.⁶ F07M ***41/14***

U.S. Cl. 123—502 **4 Claims**



1. A fuel pumping apparatus for supplying fuel to a compression ignition engine comprising a bore (13) and a pumping plunger (14) mounted therein, an outlet (15) from the bore and through which fuel can be displaced to an associated engine during inward movement of the plunger in the bore, cam means (24) for imparting inward movement to the plunger in timed relationship with the associated engine, a piston (25) slidable within a cylinder (26), said piston being coupled to said cam means whereby movement of the piston with the cylinder will vary the timing of fuel delivery to the engine, a resilient means (27) biasing the piston towards one end of the cylinder, valve means (28) through which fluid under pressure can be supplied to said one end of the cylinder to vary the setting of said piston, a further piston (31) housed in a further cylinder (30), passage means connecting said one end of said further cylinder (30) with said cylinder (26), a pre-stressed spring (32) urging the further piston towards said one end of the further cylinder, said further piston being subjected to the fluid pressure in said one end of said first mentioned cylinder (26) and yielding to allow movement of the piston (25) under the action of the cam reaction forces, and stop means (33) acting to limit the movement of the further piston (31) against the action of the pre-stressed spring (32).

5,462,034

INTENSIVE SELF-DIAGNOSING SYSTEM FOR ENGINE EXHAUST GAS CONTROL COMPONENTS AND SYSTEMS

Yoichi Kadota, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 10, 1994, Ser. No. 208,383

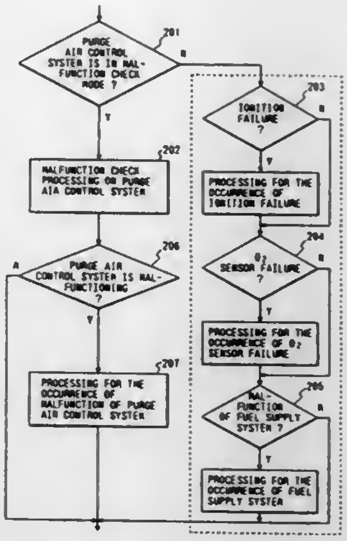
Claims priority, application Japan, Jul. 27, 1993, 5-204509

Int. Cl.⁶ F02M ***25/08***

U.S. Cl. 123—520 **4 Claims**

1. A self-diagnosing system for exhaust gas control components and systems for an engine, comprising:

purge air processing means for having purge air absorbed by an absorbent, and supplying purge air released from the absorbent to the engine through a purge air passageway by operating a control valve;


PURGE AIR CONTROL SYSTEM IS IN MALFUNCTION CHECK MODE ?
201
N
Y
MALFUNCTION CHECK PROCESSING ON PURGE AIR CONTROL SYSTEM
202
PURGE AIR CONTROL SYSTEM IS MALFUNCTIONING ?
206
N
Y
PROCESSING FOR THE OCCURRENCE OF MALFUNCTION OF PURGE AIR CONTROL SYSTEM
207
IGNITION FAILURE ?
203
N
Y
PROCESSING FOR THE OCCURRENCE OF IGNITION FAILURE
O₂ SENSOR FAILURE ?
204
N
Y
PROCESSING FOR THE OCCURRENCE OF O₂ SENSOR FAILURE
MALFUNCTION OF FUEL SUPPLY SYSTEM ?
205
N
Y
PROCESSING FOR THE OCCURRENCE OF FUEL SUPPLY SYSTEM

means for checking for a malfunction of the purge air processing means based on a variation of a fuel tank inner pressure or an air-fuel ratio of the engine in response to forced introduction of the purge air into the engine by the purge air processing means;

means for prohibiting operations of checking for a failure or malfunction of exhaust gas control components and systems other than the purge air processing means while the malfunction checking means is checking for a malfunction of the purge air processing means; and

means for canceling an affirmative result of a judgment, already made during a current engine operation, of the failure or malfunction of the exhaust gas control components and systems other than the purge air processing means if the malfunction checking means judges that the purge air processing means is malfunctioning.

5,462,035

SUPERCHARGING DEVICE

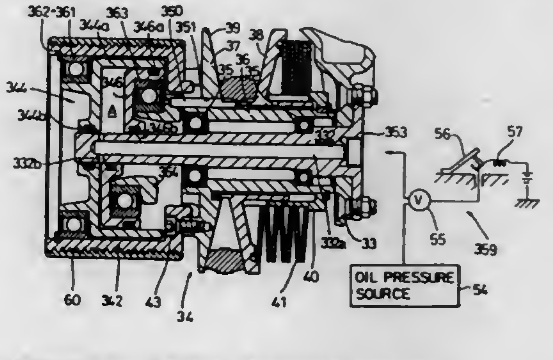
Masao Teraoka; Tomiaki Ochiai, and Mitsuru Hasegawa, all of Tochigi, Japan, assignors to Tochigi Fugi Sangyo Kabushiki Kaisha, Japan

Filed May 20, 1993, Ser. No. 65,245

Claims priority, application Japan, May 21, 1992, 4-033586 U; May 21, 1992, 4-033606 U

Int. Cl.⁶ F02B ***39/04;*** **F16H** ***59/00***

U.S. Cl. 123—561 **4 Claims**



1. A continuously variable transmission comprises:

a drive pulley and a driven pulley,

a belt for operatively coupling said drive pulley with said driven pulley, said drive pulley and said driven pulley each having an stationary flange and a movable flange, said movable flanges being axially movable relative to the stationary flanges, said stationary and movable flanges forming a radially tapered annular slot which guides the belt, said drive pulley being rotatably mounted on a stationary shaft, said stationary shaft having an opening extending lengthwise through the stationary shaft;

loading means, abutting said movable flanges, for urging the movable flanges towards the stationary flanges on said drive and driven pulleys in an axial direction relative to said stationary flanges, said loading means being formed as a fly weight and a spring element, said fly weight being provided in the driven pulley, said spring element being provided in the drive pulley;

a control device controlling the axial distance between the stationary and movable flanges of the drive pulley, said control device including an actuator, said actuator including a cylinder and a piston forming a chamber hermetically sealed with respect to the exterior which can be pressurized by a fluid pressure, said piston being connected with the movable flange, said chamber being enabled to be pressurized through the opening of the stationary shaft, said actuator under low load condition pushing away the movable flange from the stationary flange against the restoring force of the spring element; and

an input pulley driven by an internal combustion engine and attached to the drive pulley for transmitting engine force of the internal combustion engine to the drive pulley, said actuator being detachably disposed inside said input pulley;

wherein the cylinder is supported by the stationary shaft and there is provided a circumferential gap between an inner wall of the input pulley and an outer wall of the cylinder, and wherein the cylinder is pivotally mounted on, and axially supported against, the input pulley.

5,462,036

IGNITION SYSTEM FOR INTERNAL COMBUSTION ENGINES

Karl-Heinz Kugler, Vaihingen; Walter Gollin, Moeglingen; Karlheinz Riedel, Vaihingen, and Christian Zimmermann, Pleidelsheim, all of, Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

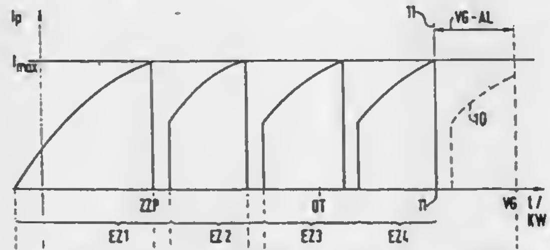
PCT No. PCT/DE93/00646, § 371 Date May 26, 1994, § 102(e) Date May 26, 1994, PCT Pub. No. WO94/03724, PCT Pub. Date Feb. 17, 1994

PCT Filed Jul. 22, 1993, Ser. No. 211,578

Claims priority, application Germany, Aug. 8, 1992, 42 26 246.1

Int. Cl.^{6} F02P *15/10;3/045;9/00*

U.S. Cl. 123—609 **10 Claims**



1. An ignition system for an internal combustion engine, comprising:

a control device for controlling a flow of current in at least one ignition coil;

the control device repeatedly connecting and disconnecting a primary current from the at least one ignition coil to spark a plurality of individual ignitions of a sequential spark ignition, wherein each connection of the primary current to the at least one ignition coil signifies a starting of a charging process for a corresponding one of the plurality of individual ignitions and each disconnection of the primary current from the at least one ignition coil signifies a closing of the charging process for the corresponding one of the plurality of individual ignitions, a charging process time for the corresponding one of the plurality of individual ignitions being a difference between a time of the closing of the charging process for the corresponding one of the plurality of individual ignitions and a time of the starting of the charging process for the corresponding one of the plurality of individual ignitions; and

the control device determining a distribution limit and determining a charging process time for a final ignition of the plurality of individual ignitions, the control device subtracting the charging process time for the final ignition of the plurality of individual ignitions from the distribution limit to obtain another limit, the control device inhibiting the starting of the charging process for any one of the plurality of individual ignitions after the another limit is reached.

5,462,037

A/F RATIO ESTIMATOR FOR MULTICYLINDER INTERNAL COMBUSTION ENGINE

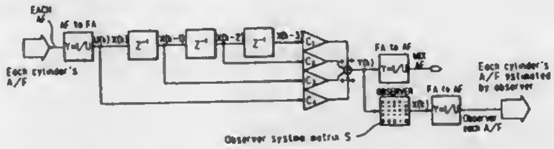
Yusuke Hasegawa, and Hidetaka Maki, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 1, 1993, Ser. No. 158,800

Claims priority, application Japan, Dec. 2, 1992, 4-349699

Int. Cl.^{6} F02D *41/14*

U.S. Cl. 123—673 **12 Claims**



1. An air/fuel ratio estimator for estimating an air/fuel ratio of a mixture supplied to each cylinder of a multicylinder internal combustion engine through an output of an air/fuel ratio sensor installed at a confluence point of an exhaust system of said engine, comprising:

estimating means for modeling said exhaust system by at least one state equation having a state variable indicative of said air/fuel ratio to estimate said air/fuel ratio of each cylinder of said engine, said estimating means includes a control means for controlling said air/fuel ratio at each cylinder to a desired value based on said estimated air/fuel ratio; and

a limiting means for establishing a limit for said state variable such that said state variable is replaced with a value if said state variable exceeds said limit.

5,462,038

AIR/FUEL PHASE CONTROL

Allan J. Kotwicki, Dearborn; Paul J. Szuszman, Ann Arbor; Edward L. Christensen, Farmington, and Susan J. Lloyd, Ann Arbor, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 9, 1994, Ser. No. 352,472

Int. Cl.^{6} F02D *41/14*

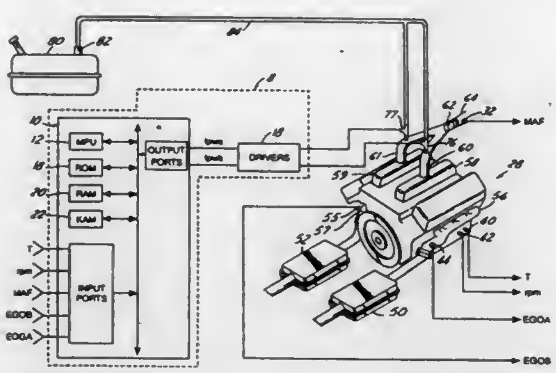
U.S. Cl. 123—681 **9 Claims**

1. An air/fuel control method responsive to first and second exhaust gas oxygen sensors each coupled to respective first and second engine banks for maintaining oscillations in air/fuel ratio between the banks in opposite phases, comprising the steps of:

generating a feedback signal from a difference in output signals of the first and second sensors;

providing a first adjustment signal and a second adjustment signal from said first and second sensor output signals respectively;

creating a first modified feedback signal from a summation of said feedback signal and said first adjustment signal;



creating a second modified feedback signal from a summation of said second adjustment signal and an inverse of said feedback signal; and

adjusting fuel delivered to the first bank by said first modified feedback signal and adjusting fuel delivered to the second bank by said second modified feedback signal.

5,462,039
AIR-FUEL RATIO CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE

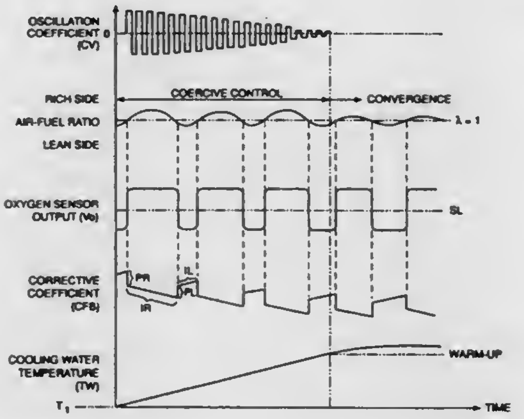
Kiyotaka Mamiya, Higashihiroshima; Michihiro Imada, and Takanobu Morimasa, both of Hiroshima, all of, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Dec. 14, 1993, Ser. No. 166,027

Claims priority, application Japan, Dec. 14, 1992, 4-332978

Int. Cl.⁶ F02D *41/14*

U.S. Cl. 123—686 **11 Claims**



1. An air-fuel ratio control system for an internal combustion engine in which an air-fuel ratio feedback control is executed to converge an air-fuel ratio toward a target air-fuel ratio, which provides a satisfactory exhaust gas purifying efficiency of an exhaust gas purifying device, on the basis of an oxygen concentration in an exhaust gas detected by an oxygen sensor and which coercively deflects the air-fuel ratio so as to make a fuel mixture alternatively richer and leaner during an execution of the air-fuel ratio feedback control, said air-fuel ratio control system comprising:

activation detecting means for detecting a progress of activation of the exhaust gas purifying device; and

control means for, when the activation detecting means detects a progress of activation of the exhaust gas purifying device less than a predetermined level, increasing an extent of deflection of the air-fuel ratio and decreasing the extent of deflection of the air-fuel ratio with the progress of activation of the exhaust gas purifying device.

5,462,040
METHOD FOR DISTINGUISHING CAUSES OF ERROR IN THE MIXTURE FORMING OR MIXTURE REGULATING SYSTEM OF AN INTERNAL COMBUSTION ENGINE

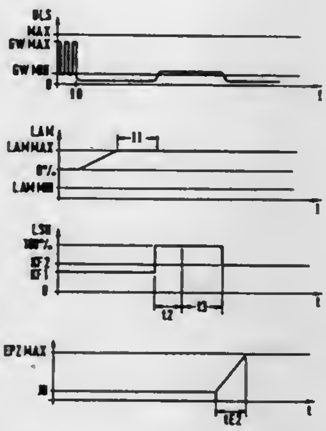
Stefan Krebs, Regensburg; Ludwig Kettl, Aiterhofen, and Wojciech Cianciara, Gruenthal, all of, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed May 16, 1994, Ser. No. 243,328

Claims priority, application European Pat. Off., May 14, 1993, 93107898

Int. Cl.⁶ F02D *41/14;41/22*

U.S. Cl. 123—688 **4 Claims**



1. In a method for distinguishing sources of error in a mixture formation or mixture regulating system of an internal combustion engine having an exhaust system with a lambda regulator and a heated lambda sensor, which includes regulating a fuel-air mixture supplied to the engine to a set-point value on the basis of an output signal of the lambda sensor, the improvement which comprises:

continuously measuring a value of a sensor voltage;

comparing the value of the sensor voltage with a lower diagnostic limit value and an upper diagnostic limit value;

varying a lambda regulator value of the lambda regulator in an enriching direction to a maximum lambda regulation limit if the lower diagnostic limit value fails to be attained, and varying the lambda regulator value in a leaning down direction to a minimum lambda regulation limit if the upper diagnostic limit value is exceeded;

raising the heating output of the sensor heater after a time period has elapsed during which there is no departure from the maximum lambda regulation limit, and lowering the heating output of the sensor heater after a time period has elapsed during which there is no departure from the minimum lambda regulation limit;

drawing a conclusion that there is a permanently lean mixture formation error if the lower diagnostic limit value for permanently lean mixtures is exceeded again, and drawing a conclusion that there is a permanently rich mixture formation error if the upper diagnostic limit value fails to be attained again; and

otherwise detecting a sensor error.

5,462,041
ADJUSTABLE ARROW GUIDE

Dennis Solecki, 306 Dossenbach Dr., LaSalle, Ontario, Canada

Filed Dec. 20, 1993, Ser. No. 169,420

Int. Cl.⁶ F41B *5/22*

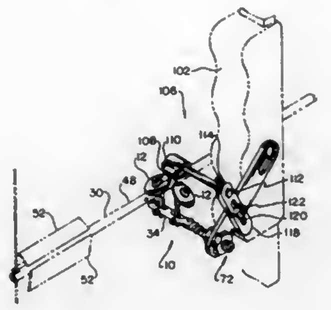
U.S. Cl. 124—44.5 **4 Claims**

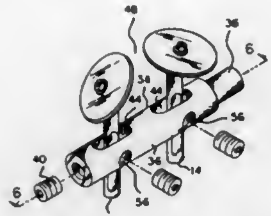
2. An arrow guide comprising:

a. a first and a second guiding spool each having a post, and a head adapted to rotate about the post;

b. a hollow cylindrical locator having:

(1) a first sealed end and a second end;





(2) a pair of guiding holes extending through the locator with each guiding post disposed within a hole such that the heads of the guiding spools define an adjustable arrow-receiving guiding space therebetween;

(3) tension spring including a first spring positioned within the locator between the first end of the locator and bottom end of the first guiding post, a second spring positioned within the locator between the bottom end of the guiding posts of the first and second spools, and a third spring positioned within the locator between the bottom leg of the second guiding post and the second end of the locator;

(4) means for adjusting the tension on the springs for varying the guiding space; and

(5) means for securing the bottom end of each post to the locator; and

c. a guide holder for coupling the locator to a bow.

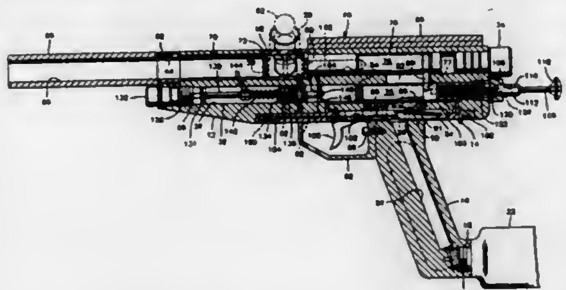
5,462,042
SEMIAUTOMATIC PAINT BALL GUN

Andrew J. Greenwell, 1481 Hillside Pl., Yuma, Ariz. 85364

Filed Oct. 29, 1993, Ser. No. 142,921

Int. Cl.^{6} F41B *11/32*

U.S. Cl. 124—76 **21 Claims**



6. A gun including a frame, a barrel assembly supported from said frame having front and rear ends and defining a bore, a projectile magazine comprising a rear portion of said assembly and defining a rearward extension of said bore, said magazine opening upwardly and outwardly to one side of said barrel, said frame and magazine including coacting means removably supporting said magazine from said frame for selected front-to-rear reversed support of said magazine from said frame whereby said magazine may be mounted to open upwardly and outwardly to either side of said barrel, and projection means operative to provide gas under pressure within said rearward extension of said barrel.

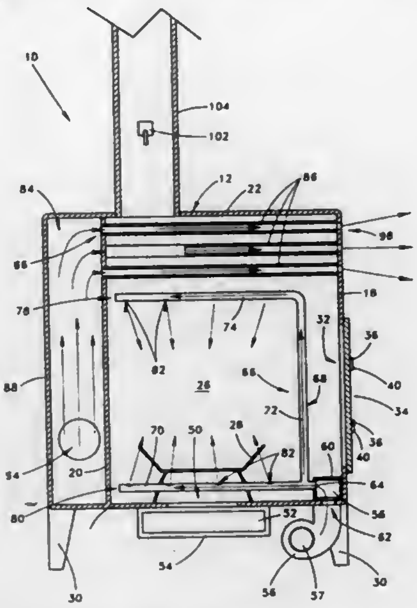
5,462,043
WOOD BURNING FURNACE

Keith J. Rose, 1347 Fleck Rd., P.O. Box 119, Six Lakes, Mich. 48886, and William S. Rose, 4697 Jefferson Rd., Lakeview, Mich. 48850

Filed Nov. 14, 1994, Ser. No. 338,321

Int. Cl.^{6} F24H *3/02*

U.S. Cl. 126—110 R **12 Claims**



1. A wood burning furnace, comprising:

an enclosed combustion chamber including a top, a bottom, a back, a front and opposing side walls;

a fuel supply opening to said combustion chamber, a door supported for movement to open and close said supply opening;

a fuel support frame located within said enclosed combustion chamber for supporting fuel materials therewithin;

an air distribution manifold disposed within said combustion chamber having a first opening disposed above said fuel support frame and a second opening disposed below said fuel support frame, said first and said second outlet openings being oriented and arranged to direct air passing therethrough generally toward the fuel materials on said fuel support frame;

a combustion air blowing means for blowing air through said first and said second outlet openings; and

a flue outlet extending from said combustion chamber for directing exhaust gases therefrom.

5,462,044
SAFETY DEVICE FOR USE WITH PORTABLE HEATER

Tomio Nitta; Hideo Mifune; Masato Seki; Yosimitu Kaga, and Noriyuki Serizawa, all of Shizuoka, Japan, assignors to Tokai Corporation, Shizuoka, Japan

PCT No. PCT/JP93/00526, § 371 Date Dec. 28, 1993, § 102(e) Date Dec. 28, 1993, PCT Pub. No. WO93/21808, PCT Pub. Date Nov. 11, 1993

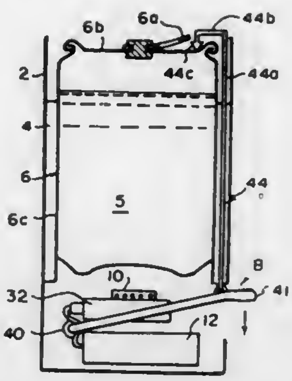
PCT Filed Apr. 23, 1993, Ser. No. 170,225

Claims priority, application Japan, May 1, 1992, 4-112553; Jun. 17, 1992, 4-158044; Jun. 17, 1992, 4-158137; Jul. 22, 1992, 4-216352; Jan. 2, 1992, 4-264655; Nov. 12, 1992, 4-302178; Mar. 31, 1993, 5-073627

Int. Cl.^{6} A47G *23/04*

U.S. Cl. 126—262 **5 Claims**

1. A safety device for use with a portable heater comprising a combustion cylinder having a bottom part and an upper part, a burner disposed at the bottom of the combustion cylinder, a container to be heated which is disposed in the upper part of the combustion cylinder for storing contents which are heated when

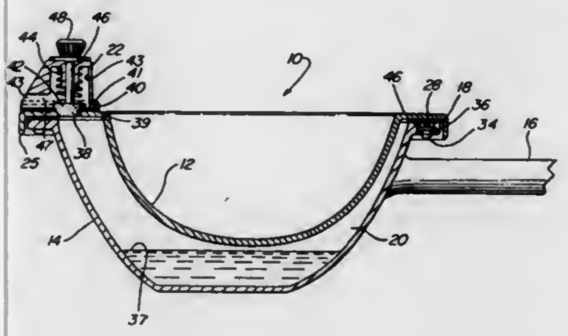


the heater is in use, a fuel tank for storing fuel gas to be supplied to the burner, an ignition means having an ignition lever for igniting the burner, and a hole-opening lever that moves in conjunction with the ignition lever which ignites the burner and also automatically bores an exhaust hole in the upper part of the container body.

5,462,045

PRESSURIZED STEAM HEATED COOKING PAN

Martin G. Paige, 123 Ravenna Dr., Long Beach, Calif. 90803
Filed Dec. 20, 1994, Ser. No. 360,240
Int. Cl.⁶ A47J *27/06*
U.S. Cl. 126—378 **17 Claims**



1. A cooking pan comprising, in combination:

a metallic outer shell member having inner and outer surfaces, an open top, a peripheral flange formed on and completely surrounding said open top, and a handle secured to the outer surface thereof;

a metallic inner pan having an open top and a peripheral flange formed on and completely surrounding said open top;

said metallic inner pan being received in and secured to said metallic outer shell member with an interior chamber formed therebetween for holding water and steam;

an insulating gasket provided between said peripheral flange of said metallic outer shell and said peripheral flange of said metallic inner pan;

said peripheral flange of said metallic inner pan having a plurality of fastening means depending from a lower surface thereof so as to pass through a plurality of openings formed in and passing through said peripheral flange of said metallic outer shell member with said gasket therebetween;

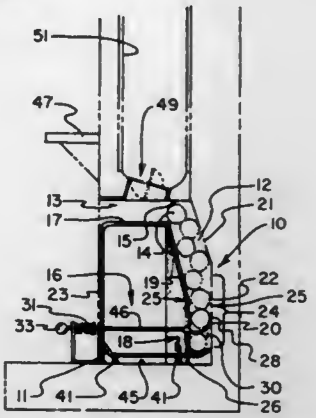
a plurality of securing means fixed to said fastening means to secure said peripheral flanges together; and

a plurality of insulating sleeves provided in said plurality of openings, around said fastening means, whereby said gasket and said insulating sleeves prevent any metal-to-metal contact between said metallic outer shell member and said metallic inner pan.

5,462,046

FIREPLACE LOG DISPENSING APPARATUS

Jacquilyn K. Hannah, 5690 Hwy. 166, Douglasville, Ga. 30135
Filed Apr. 22, 1994, Ser. No. 231,496
Int. Cl.⁶ F24B *1/199*
U.S. Cl. 126—501 **19 Claims**



1. A new and improved fireplace log dispensing apparatus, comprising:

gravity feed chute assembly means for receiving a plurality of logs to be burned in a fireplace,

log dispenser assembly means, connected at a bottom of said gravity feed chute assembly means, for selectively dispensing logs into the fireplace,

horizontal rails, supported by vertical legs, connected to said gravity feed chute assembly means for feeding logs into said gravity feed chute assembly means, and

a log grate connected to said gravity feed chute assembly means and to said vertical legs,

wherein said gravity feed chute assembly means include a front fire protection wall which is connected to said horizontal rails and which protects the logs from being burned by a fire in the fireplace,

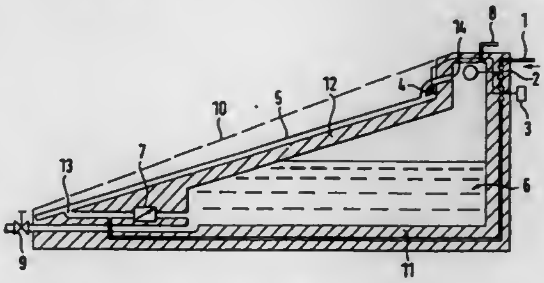
wherein said front wall and a rear wall of the fireplace define a space forming said gravity feed chute assembly, and

wherein said log dispenser assembly means, connected at a bottom of said gravity feed chute assembly means, selectively dispenses logs onto said log grate for burning in a fire in the fireplace.

5,462,047

SOLAR WATER-HEATER WITH INTEGRATED STORAGE

Jürgen Kleinwächter, Kandern, and Ulrich Leibfried, Lörrach, both of, Germany, assignors to Klaus Herrmann Aktiengesellschaft, Schwerte, Germany
Filed Jun. 18, 1993, Ser. No. 77,776
Claims priority, application Switzerland, Jun. 19, 1992, 01933/92
Int. Cl.⁶ F24J *2/44*
U.S. Cl. 126—639 **13 Claims**



1. A solar water heater comprising:

a thermally insulated storage tank (6);

an absorber (5) integrated as a unit with said storage tank and arranged to receive solar energy, said absorber, for the purpose of enabling a flow of water therethrough to which solar heat collected by the absorber can be transferred, having an associated absorber intake (13) an absorber discharge (14) wherein the absorber intake is positioned lower than said absorber discharge, said absorber intake communicating with said storage tank and said absorber discharge opening into said storage tank below the highest point of said storage tank;

a thermally insulated layer (12) interposed between said storage tank and said absorber;

a thermostatically controlled cold-water supply means (1) including a cold water inlet and means for directly communicating said cold-water inlet with said absorber intake, said communicating means including a level-control means to control the level of water in said storage tank, a plurality of flow valves (2,3) for controlling the supply of cold water and a thermostatic control-sensor means for regulating the position of at least one of said plurality of flow valves, said communicating means controlling the flow of water such that a predetermined temperature is attained at the absorber discharge, the cold water entering said absorber through said absorber intake is heated on one pass through said absorber and said storage tank is filled isothermally with hot water being expelled from said absorber through said absorber discharge, said storage tank, together with said absorber, constituting a fully communicating water system with low flow impedance and wherein, upon solar irradiation, thermosiphoning occurs in a circulating manner to further heat the water in said storage tank in order to compensate for heat losses from the system.

5,462,048
HEAT AND MOISTURE EXCHANGER

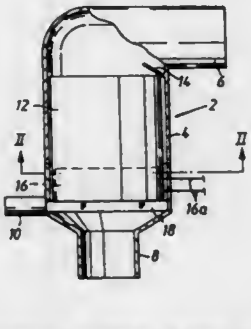
Hans Lambert, Stockholm, and Jan Grebius, Sollentuna, both of, Sweden, assignors to Gibeck Respiration AB, Upplands Vaesby, Sweden

Filed Sep. 15, 1994, Ser. No. 305,914

Claims priority, application Sweden, Sep. 17, 1993, 9303044

Int. Cl.^{6} A61M *16/00;* **A62B** *18/08*

U.S. Cl. 128—201.13 **12 Claims**



1. A heat and moisture exchanger adapted to be connected to a patient to humidify and warm air which is inhaled by the patient, the heat and moisture exchanger comprising:

a heat and moisture exchanger unit which comprises a plurality of layers oriented substantially parallel to a direction of air flow; and

a warming device disposed adjacent to the heat and moisture exchanger unit to increase a heat supply to the inhaled air, said warming device being interposed between at least two of the layers of the heat and moisture exchanger unit.

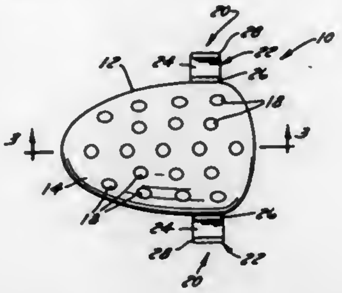
5,462,049
INTRAORAL SMOKE REMOVAL DEVICE

Edward Q. Yavitz, 3828 Spring Creek Rd., Rockford, Ill. 61114

Filed Jun. 7, 1994, Ser. No. 254,990

Int. Cl.^{6} A62B *7/10;23/02;* **A61C** *3/00*

U.S. Cl. 128—205.27 **20 Claims**



1. A disposable intraoral device for absorbing airborne contaminants normally inhaled into the lungs of a wearer, comprising:

a pad conformed to fit the palate of a human mouth, the pad including:

an airborne contaminant absorber;

a first surface configured to lie along the palate of a human mouth; and

an exterior absorbent surface exposed to the tongue of a human mouth.

5,462,050
ANESTHETIC MASK FOR INFANTS

Monika Dahlstrand, Karlskrona, Sweden, assignor to Engstrom Medical Aktiebolag, Sweden

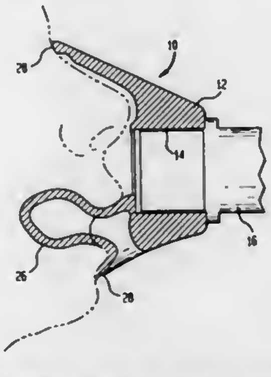
PCT No. PCT/SE92/00470, § 371 Date Jan. 10, 1994, § 102(e) Date Jan. 10, 1994, PCT Pub. No. WO93/01854, PCT Pub. Date Feb. 4, 1993

PCT Filed Jun. 25, 1992, Ser. No. 178,239

Claims priority, application Sweden, Jul. 19, 1991, 9102205

Int. Cl.^{6} A61M *16/01*

U.S. Cl. 128—207.18 **7 Claims**



1. An anesthesia mask for use by infants comprising:

a bowl shaped elastic body portion adapted for sealingly surrounding a face of an infant around a nose and a mouth, said body portion having a peripheral edge including an inwardly directed bead and an interior portion with a central opening for connection to an anesthesia tube; and

means to facilitate sealing of said peripheral edge against the face and to substantially prevent entrance of anesthetic into the mouth from said interior portion, said means including a teat shaped suction piece independent of said central opening and unitary with the bowl shaped elastic body portion, said teat shaped suction piece having upper and lower surfaces for sealing engagement with the lips being displaced from said central opening and positioned for insertion into the mouth of the infant;

whereby as the infant sucks on said teat shaped suction piece entrance of the anesthetic into the mouth is blocked and the peripheral edge is drawn into sealing engagement with the face.

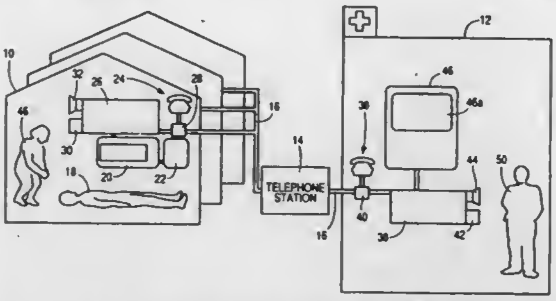
5,462,051
MEDICAL COMMUNICATION SYSTEM

Tohru Oka, Ichinomiya; Chikao Harada, Komaki, and Hidenori Suzuki, Nagoya, all of, Japan, assignors to Colin Corporation, Aichi, Japan

Filed Aug. 31, 1994, Ser. No. 298,200

Int. Cl.^{6} A61B *5/021;5/04*

U.S. Cl. 128—630 **14 Claims**



1. A medical communication system for transmitting physical information of a living body to a medical worker, comprising:
  (A) a physical information sensor device including
    (a1) a physical information sensor which is adapted to be worn on said living body to obtain said physical information of the living body, and generates a physical information signal representing the obtained physical information, and
    (a2) a first signal transmitter which transmits said physical information signal at a first output power;
  (B) a first signal transmitting and receiving device including
    (B') a monitor unit which is adapted to be disposed near to (A) said physical information sensor device on a side of said living body, and includes
      (b1) a first signal receiver which receives said physical information signal from (a2) said first signal transmitter of (A) said physical information sensor device, and which receives an instruction signal representing an instruction of said medical worker directed to at least one of said living body and an attendant person for the living body,
      (b2) abnormality identifying means for identifying whether said ,physical information represented by said physical information signal received by (b1) said first signal receiver is abnormal,
      (b3) a second signal transmitter which transmits, at a second output power higher than said first output power, said physical information signal identified as being abnormal by (b2) said abnormality identifying means, and
      (b4) an instruction output device which outputs said instruction of said medical worker represented by said instruction signal received by (b1) said first signal receiver, so that said at least one of said living body and said attendant person receives the instruction; and
    (B") a diagnosing and informing device which is adapted to be disposed away from (B') said monitor unit, and includes
      (b5) a second signal receiver which receives said physical information signal from (b3) said second signal transmitter,
      (b6) diagnosing means for diagnosing whether said physical information represented by said physical information signal received by (b5) said second signal receiver is abnormal,
      (b7) a wire communication circuit including (b7-1) a third signal transmitter which transmits said physical information signal diagnosed as being abnormal by (b6) said diagnosing means, to said medical worker, via a wire communication line as a communication channel, and (b7-2) a third signal receiver which receives via said wire communication line said instruction signal representing said instruction of said medical worker in relation to said physical information represented by said physical information signal transmitted to said medical worker, and
      (b8) a fourth signal transmitter which transmits, to (b1) said first signal receiver, said instruction signal and a diagnosis signal representing that said physical information represented by said physical information signal received by (b5) said second signal receiver has been diagnosed as being abnormal by (b6) said diagnosing means,
    (B') said monitor unit further including
      (b9) an alarm device which issues an alarm indicating that said physical information represented by said physical information signal has been diagnosed as being abnormal by (b6) said diagnosing means, when (b1) said first signal receiver receives said diagnosis signal from (b8) said fourth signal transmitter, and
  (C) a second signal transmitting and receiving device which is adapted to be disposed on a side of said medical worker, and includes
    (c1) a fourth signal receiver which receives, via said wire communication line, said physical information signal from (b7-1) said first signal transmitter,
    (c2) a physical-information output device which outputs said physical information of said living body represented by said physical information signal received by (c1) said fourth signal receiver, so that said medical worker receives the physical information,
    (c3) an instruction input device which is operable for inputting said instruction of said medical worker and generates said instruction signal representing the input instruction of the medical worker, and
    (c4) a fifth signal transmitter which transmits via said wire communication line said instruction signal to (b7-2) said third signal receiver.

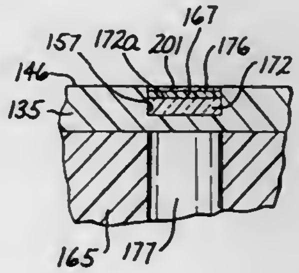
5,462,052
APPARATUS AND METHOD FOR USE IN MEASURING A COMPOSITIONAL PARAMETER OF BLOOD

John L. Gehrich, Laguna Beach; Thomas P. Maxwell, Santa Ana; Thomas G. Hacker, Anaheim, and Mark Z. Holody, Irvine, all of Calif., assignors to Minnesota Mining And Manufacturing Co., St. Paul, Minn.

Continuation of Ser. No. 564,800, Aug. 7, 1990, abandoned, which is a continuation-in-part of Ser. No. 229,617, Aug. 8, 1988, Pat. No. 4,989,606, which is a continuation-in-part of Ser. No. 8,937, Jan. 30, 1987, Pat. No. 4,830,013. This application Apr. 27, 1993, Ser. No. 55,800

Int. Cl.^{6} A61B *5/00*

U.S. Cl. 128—632 **20 Claims**



1. A sensor cassette for use in measuring a compositional parameter of blood comprising:

a housing having a wall defining a passage which is adapted to receive blood, said wall being at least somewhat permeable to the compositional parameter of blood;

a support element carried by a region of said wall;

said support element being less permeable to the compositional parameter of blood than said housing;

a sensor carried by the support element, said sensor providing a signal in response to the compositional parameter of blood; and

said support element separating the sensor from at least a portion of said region of the wall whereby the effect of the permeability of the housing to the compositional parameter of blood on said signal is reduced.

5,462,053
STABLE ARTIFACT-FREE IMAGING CONTRAST SUSPENSION AGENT

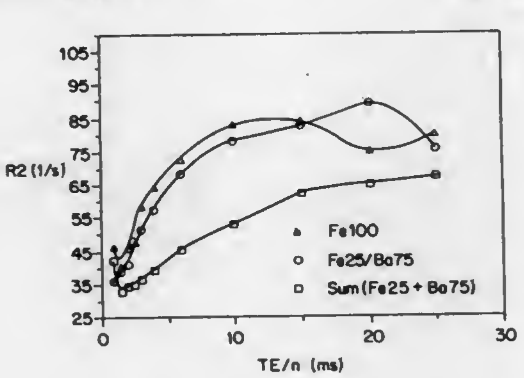
Richard W. Briggs, and Zhen Wu, both of Gainesville, Fla., assignors to University of Florida, Gainesville, Fla.

Continuation-in-part of Ser. No. 925,549, Aug. 7, 1992, Pat. No. 5,323,780. This application Jun. 28, 1994, Ser. No. 266,756

The portion of the term of this patent subsequent to Jun. 28, 2011, has been disclaimed.

Int. Cl.^{6} A61B *5/05*

U.S. Cl. 128—653.4 **20 Claims**



1. A contrast agent adapted for magnetic resonance imaging of a sample, said contrast agent comprising a suspension in a medium acceptable for magnetic resonance imaging of (a) coated particles of a contrast agent possessing paramagnetic characteristics and (b) coated particles of a contrast agent possessing diamagnetic characteristics, each of said coatings being selected from a group of materials which [I] renders said coated particles (a) and (b) substantially compatible with and substantially biologically and substantially chemically inert to each other and the environments to which said contrast agent is exposed during magnetic resonance imaging and [II] which substantially stabilizes said suspension; the nature of each of said coatings and the relative amounts of (a) and (b) in said suspension being such that the positive magnetic susceptibility of (a) substantially offsets the negative magnetic susceptibility of (b) and the resulting suspension has substantially zero magnetic susceptibility and, when employed in magnetic resonance imaging, results in the substantial elimination of imaging artifacts.

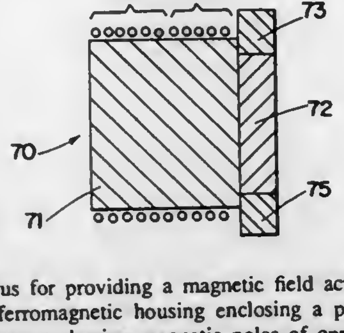
5,462,054
PERMANENT MAGNET ARRANGEMENT

Uri Rapoport, Oak Park, and Richard Panosh, Lisle, both of Ill., assignors to Advanced Techtronics, Inc., Chicago, Ill.

Division of Ser. No. 775,840, Oct. 15, 1991, Pat. No. 5,320,103, which is a continuation of Ser. No. 277,209, Nov. 29, 1988, Pat. No. 5,063,934, which is a continuation-in-part of Ser. No. 106,114, Oct. 7, 1987, Pat. No. 4,998,976. This application Mar. 31, 1994, Ser. No. 221,028

Int. Cl.^{6} A61B *5/055*

U.S. Cl. 128—653.5 **22 Claims**



1. Apparatus for providing a magnetic field across a gap and including a ferromagnetic housing enclosing a pair of opposed permanent magnets having magnetic poles of opposite magnetic polarity facing one another across a gap, said permanent magnets having facing ends that face toward one another, a ferromagnetic pole piece positioned against each said facing end, each said pole piece being smaller than and outwardly overlapped by said facing end against which it is positioned, and an auxiliary magnet peripherally surrounding each said pole piece and extending outwardly beyond each said facing end of said permanent magnets.

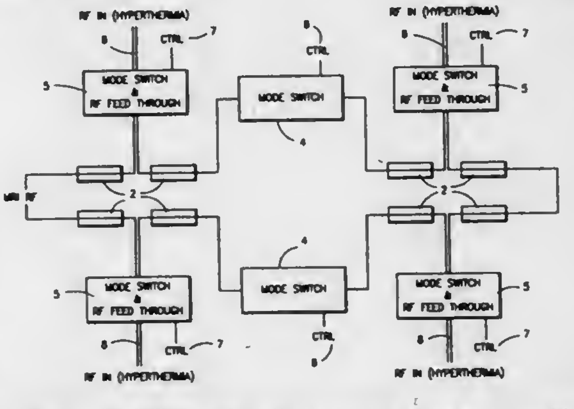
5,462,055
MRI/HYPERTHERMIA DUAL FUNCTION ANTENNA SYSTEM

James A. Casey, Smithtown, and Robert E. McGill, Dix Hills, both of N.Y., assignors to Northrop Grumman Corporation, Los Angeles, Calif.

Filed Aug. 23, 1994, Ser. No. 294,500

Int. Cl.^{6} A61B *5/055*

U.S. Cl. 128—653.5 **4 Claims**



1. MRI/hyperthermia dual function antenna apparatus, comprising:

a plurality of antenna elements;

switch means for selectively connecting and disconnecting said antenna elements to and from each other;

MRI RF energy supply means for supplying MRI RF energy collectively to said antenna elements when they are connected together by said switch means; and

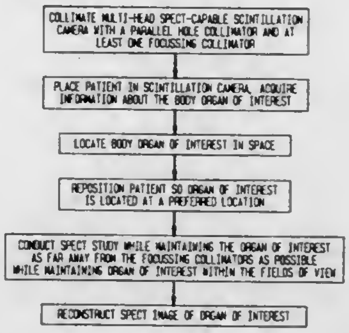
feedthrough means for supplying hyperthermia RF energy individually to ones of said antenna elements when they are disconnected from each other by said switch means.

5,462,056

HIGH-SENSITIVITY SPECT IMAGING OF SMALL BODY ORGANS USING A MULTI-HEADSCINTILLATION CAMERA WITH NON-UNIFORM COLLIMATION

Peggy C. Hawman, Schaumburg; Jianzhong Qian, Hoffman Estates, and Jon D. Treffert, Bartlett, all of Ill., assignors to Siemens Medical Systems, Inc., Iselin, N.J.

Continuation of Ser. No. 54,804, Apr. 27, 1993, abandoned, which is a continuation-in-part of Ser. No. 765,654, Sep. 25, 1991, and Ser. No. 848,769, Mar. 10, 1992, Pat. No. 5,381,791.
This application Jan. 31, 1995, Ser. No. 382,944
Int. Cl.^{6} G01T *1/161*; G21K *1/02*
U.S. Cl. 128—659 **17 Claims**


COLLIMATE MULTI-HEAD SPECT-CAPABLE SCINTILLATION CAMERA WITH A PARALLEL HOLE COLLIMATOR AND AT LEAST ONE FOCUSSING COLLIMATOR
PLACE PATIENT IN SCINTILLATION CAMERA, ACQUIRE INFORMATION ABOUT THE BODY ORGAN OF INTEREST
LOCATE BODY ORGAN OF INTEREST IN SPACE
REPOSITION PATIENT SO ORGAN OF INTEREST IS LOCATED AT A PREFERRED LOCATION
CONDUCT SPECT STUDY WHILE MAINTAINING THE ORGAN OF INTEREST AS FAR AWAY FROM THE FOCUSSING COLLIMATORS AS POSSIBLE WHILE MAINTAINING ORGAN OF INTEREST WITHIN THE FIELDS OF VIEW
RECONSTRUCT SPECT IMAGE OF ORGAN OF INTEREST

1. A method of conducting a Single Photon Emission Computed Tomography SPECT study on a patient so as to produce a high-quality image of a relatively small organ of interest, comprising the following steps:

placing the patient in a SPECT-capable scintillation camera which has one detector collimated with a parallel hole collimator and at least one detector collimated with a focussing collimator;

acquiring information using the scintillation camera;

locating the organ of interest in space on the basis of said information; and

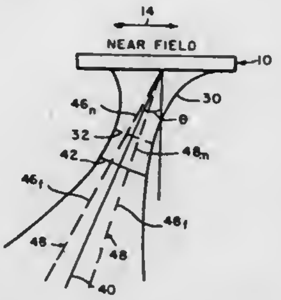
conducting a SPECT study of the patient in such a manner that each of said at least one detectors is maintained in a predetermined geometrical relationship with the organ of interest.

5,462,057

ULTRASOUND IMAGING SYSTEM USING LINE SPLICING AND PARALLEL RECEIVE BEAM FORMATION

Thomas J. Hunt, Pelham, N.H.; Benjamin M. Herrick, Boxborough, Mass.; Kimberly K. Robertson, Boxford, Mass.; Karl E. Thiele, Andover, Mass., and J. Mark Ziel, Methuen, Mass., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 254,825, Jun. 6, 1994, abandoned.
This application Aug. 9, 1994, Ser. No. 287,762
Int. Cl.^{6} A61B *8/00*
U.S. Cl. 128—661.01 **15 Claims**



1. An ultrasound imaging system comprising:

an array of ultrasound transducer elements;

a transmitter for transmitting ultrasound energy into a region of interest with said array at a plurality of steering angles with respect to said array, said transmitter, for each of said steering angles, sequentially transmitting ultrasound energy along a near field transmit scan line and a far field transmit scan line at different focal depths with respect to said array, said ultrasound energy producing ultrasound echoes from the region of interest;

a receiver for receiving signals generated by said array in response to said ultrasound echoes, said receiver including beamforming apparatus for simultaneously receiving signals along first and second near field receive scan lines in response to ultrasound energy transmitted along said near field transmit scan line, and for simultaneously receiving signals along first and second far field receive scan lines in response to ultrasound energy transmitted along said far field transmit scan line, said first near field receive scan line being co-linear with said first far field receive scan line, and said second near field receive scan line being co-linear with said second far field receive scan line, each of said receive scan lines having a receive angle with respect to said array, said receiver further including means for dynamically varying said receive angle during reception of said ultrasound echoes to compensate for spatial variations in the transmitted ultrasound energy such that each of said receive scan lines has a substantially constant effective receive angle;

means for splicing said signals received along said first near field receive scan line and said first far field receive scan line to produce signals representative of a first spliced scan line, and for splicing said signals received along said second near field receive scan line and said second far field receive scan line to produce signals representative of a second spliced scan line, thereby providing signals representative of two spliced scan lines in response to ultrasound energy transmitted along said near field and far field transmit scan lines for each of said steering angles; and

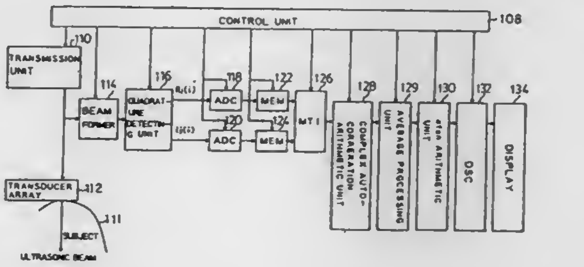
a display generator responsive to said signals representative of said spliced scan lines for generating an image of said region of interest.

5,462,058

ULTRASONIC DIAGNOSTIC SYSTEM

Isamu Yamada; Akira Shiba, and Miyuki Iizuka, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 20, 1994, Ser. No. 359,831
Claims priority, application Japan, Mar. 17, 1994, 6-047334; Aug. 15, 1994, 6-191588
Int. Cl.^{6} A61B *8/00*
U.S. Cl. 128—661.08 **38 Claims**



1. An ultrasonic diagnostic system comprising:

a transmitter-receiver for transmitting ultrasonic waves each in a scan line direction within a subject a plurality of number of times and receiving reflecting ultrasonic waves from an inside of the subject to generate received signals;

a quadrature detector for obtaining a quadrature detecting output of each of the received signals;

an auto-correlator for determining a complex auto-correlation value of the quadrature detecting output;

a movement information detector for detecting blood flow information within the subject or information as to a movement of a tissue within the subject on the basis of the complex auto-correlation value determined by said auto-correlator; and
an average arithmetic unit for determining an averaging value of the complex auto-correlation values on a plurality of points adjacent to a predetermined point within the subject,
wherein said movement information detector determines the blood flow information within the subject or the information as to a movement of a tissue within the subject on the basis of said averaging value.

5,462,059

METHOD FOR ASSESSING AND DISPLAYING VASCULAR ARCHITECTURE USING ULTRASOUND

Katherine W. Ferrara, New York, N.Y., and V. Ralph Algazi, Davis, Calif., assignors to The Regents of the University of California, Oakland, Calif.

Filed May 25, 1994, Ser. No. 248,824
Int. Cl.^{6} A61B *8/06*

U.S. Cl. 128—661.09 **26 Claims**

1. A method for assessing the vascular architecture of a tissue mass using ultrasound imaging, comprising the steps of:
(a) subjecting a tissue mass to wideband ultrasound imaging signals emitted from a transducer using velocity dependent signalling, said tissue mass having a vasculature;
(b) receiving reflections of said ultrasound imaging signals from said tissue mass and processing said reflections using velocity dependent signal processing;
(c) differentiating between reflections of said ultrasound imaging signals from stationary tissue and reflections of said ultrasound imaging signals from slowly moving blood; and
(d) identifying the vasculature of said tissue mass from said reflections of said ultrasound imaging signals.

5,462,060

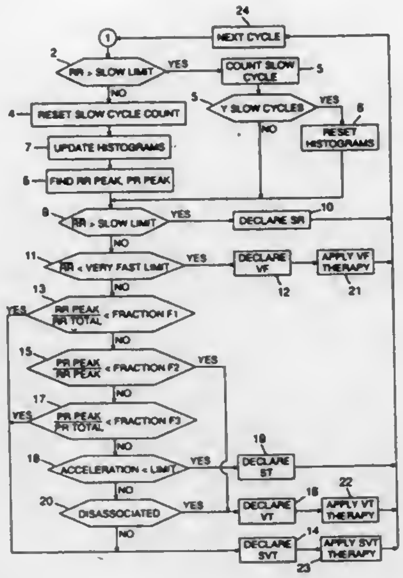
METHODS AND APPARATUS FOR DETERMINING WHEN TACHYARRYTHMIA IS PACE-TERMINABLE

Peter Jacobson, Haguenau; Daniel Kroiss, Schweighouse-Moder, and Christine Henry, Paris, all of, France, assignors to ELA Medical, S.A., Montrouge, France

Filed May 24, 1994, Ser. No. 248,329
Claims priority, application France, May 28, 1993, 93 06406
Int. Cl.^{6} A61B *5/0464*

U.S. Cl. 128—702 **81 Claims**

1. A method of analyzing a patient's cardiac activity comprising the steps of:
(a) detecting cardiac events in the atrium and the ventricle;
(b) determining an interval between each detected event in a first chamber, each interval having a time length, said first chamber being one of the atrium and the ventricle;
(c) determining a conduction interval between a sensed cardiac event in the first chamber and a preceding sensed cardiac event in the second chamber, each conduction interval having a time length, the second chamber being the other of the atrium and ventricle;
(d) forming an auto-correlation histogram of determined intervals in said first chamber corresponding to a cardiac cycle in the first chamber that is above a sinus rhythm;
(e) forming a cross-correlation histogram of determined conduction intervals corresponding to a cardiac cycle in the first chamber that is above a sinus rhythm;
(f) processing the auto-correlation histogram by
(i) scanning the auto-correlation histogram with a stability window, determining the number of intervals in the stability window for each position of the stability window in the auto-correlation histogram, and determining the maximum number of intervals within said stability window of all of the possible positions of the stability window,



(ii) determining an auto-correlation peak count as said determined maximum number of intervals that satisfy the stability window, and
(iii) providing an auto-correlation total corresponding to the number of the determined intervals in the auto-correlation histogram;
(g) processing the cross-correlation histogram by
(i) scanning the cross-correlation histogram with a conduction time window, determining the number of intervals in the conduction time window for each position of the conduction time window in the cross-correlation histogram and determining the maximum number of determined conduction intervals within said conduction time window of all of the possible positions of said conduction time window,
(ii) determining a cross-correlation peak count as the determined number of maximum determined conduction intervals that satisfy the conduction time window, and
(iii) providing a cross-correlation total corresponding to the number of the determined conduction intervals in the cross-correlation histogram; and
(h) determining whether the patient's cardiac events correspond to a tachyarrhythmia that is terminable by a stimulation pulse in the first chamber based on the determined auto-correlation peak and the determined cross-correlation peak.

5,462,061

METHOD OF ANALYZING THE FUNCTIONING OF THE LUNGS

Dominique Malouvier; Peter Müller, both of München, and Oscar Sebastiani, Klenzestrasse 81, 8000 München 5, all of, Germany, assignors to Peter Muller, and Oscar Sebastiani, both of Munich, Germany

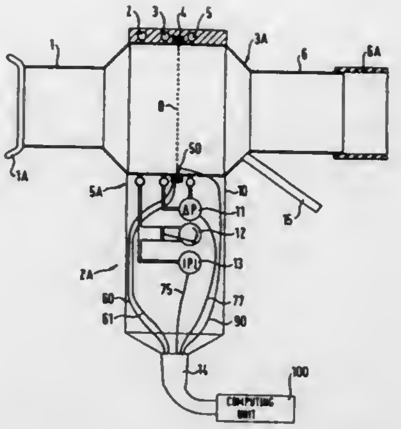
Continuation of Ser. No. 60,472, May 12, 1993, abandoned, which is a continuation of Ser. No. 853,684, Mar. 17, 1992, abandoned, which is a division of Ser. No. 581,159, Sep. 7, 1990, Pat. No. 5,107,860, which is a continuation of Ser. No. 258,110, Oct. 13, 1988, abandoned, which is a continuation of Ser. No. 893,854, Aug. 6, 1986, abandoned. This application Nov. 18, 1994, Ser. No. 342,407

Claims priority, application Germany, Aug. 16, 1985, 35 29 367.5

Int. Cl.^{6} A61B *5/08*

U.S. Cl. 128—720 **7 Claims**

1. An improved method using a pneumotachograph, for measuring respiratory parameters of a subject comprising the steps of:



- providing a pneumotachograph having a metallic grid of fine wire mesh, wherein said metallic grid experiences fluctuation in temperature resulting from a changing respiratory flow of the subject;
- inductively heating said metallic grid at a rate sufficient to prevent condensation thereon;
- wherein the step of providing a pneumotachograph comprises the step of providing a metallic grid of fine wire mesh having approximately 1200 filaments per inch;
- and obtaining a respiratory parameter measurement.

5,462,062

BONE MARROW BIOPSY NEEDLE WITH CUTTING AND/OR RETAINING DEVICE AT DISTAL END

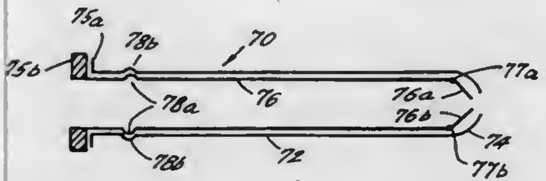
Daniel B. Rubinstein, 40 Eliot Crescent, Brookline, Mass. 02167, and Alan I. Rubinstein, 10600 Wilshire Blvd., Los Angeles, Calif. 90024

Continuation-in-part of Ser. No. 806,486, Dec. 13, 1991, abandoned. This application Apr. 6, 1992, Ser. No. 863,457

Int. Cl.⁶ A61B ***5/00***

U.S. Cl. 128—754 **11 Claims**

1. In a bone marrow biopsy needle comprising a tube which extends from a proximal end to a distal end and having an opening at the distal end for receiving a biopsy core when the needle is inserted by an operator into the bone marrow of a patient, the improvement comprising:



- cutting means completely within said tube at the distal end, the cutting means having a closed position in which the opening in the tube is closed;
- actuating means for pushing upon a portion of said cutting means in a direction toward said distal end so that the cutting means engages the tube at the distal end, and thereby guiding said cutting means into the closed position to cut the biopsy core from the bone marrow while the biopsy needle is present in the bone marrow; and
- locking means for locking the cutting means in the closed position to hold the biopsy core in the tube while the needle is being withdrawn from the patient.

5,462,063

CELL COLLECTING DEVICE

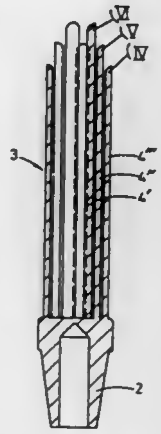
Joost Kist, Amsterdam; Willem P. G. Rovers, Oss, both of, Netherlands, and Dirk A. Vanden Berghe, Laarne, Belgium, assignors to Futura Nova B.V., Amsterdam, Netherlands

Filed Feb. 23, 1994, Ser. No. 200,412

Claims priority, application Netherlands, Feb. 25, 1993, 9300354

Int. Cl.⁶ A61B ***10/00***

U.S. Cl. 128—756 **22 Claims**



1. A device for collecting cells or other biological materials for examination thereof, comprising

- a handle having a proximal end and a distal end and defining a longitudinal axis, and
- a plurality of flexible bristles attached to the distal end of the handle, extending substantially parallel to the axis and defining a brush head, the bristles being positioned such that the cross-sectional dimensions of the brush head are substantially round.

5,462,064

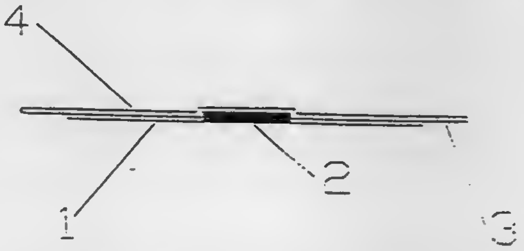
INTEGRATED SYSTEM FOR BIOLOGICAL FLUID CONSTITUENT ANALYSIS

Joseph P. D'Angelo; Henry B. Schur; Kedu Han, all of Miami, and Daniel J. Glenn, Hollywood, all of Fla., assignors to International Medical Associates, Inc., Miami, Fla.

Continuation-in-part of Ser. No. 173,635, Dec. 22, 1993. This application Mar. 14, 1994, Ser. No. 213,213

Int. Cl.⁶ A61B ***5/00***

U.S. Cl. 128—771 **15 Claims**



1. An integrated system for biological fluid constituent analysis, comprising:

- collector means for non-invasively collecting a body fluid analyte from a patient and indicator means responsive to the body fluid analyte for indicating a condition of the body fluid analyte;
- ethyl ether to be brought in contact with the patient's skin for enhancing a diffusion rate thereof; and
- electronic interpretation means receiving said indicator means and electro-optically interpreting said indicator means with regard to the condition of the body fluid analyte.

5,462,065

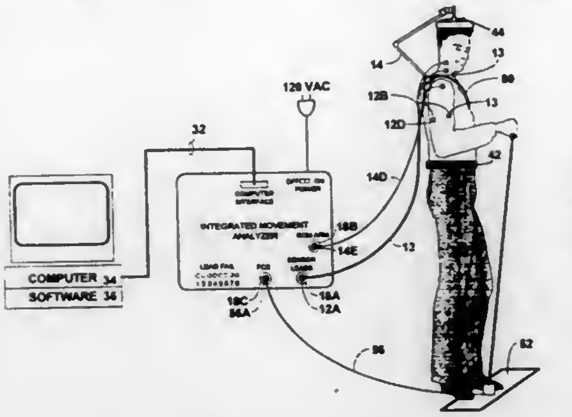
INTEGRATED MOVEMENT ANALYZIING SYSTEM

MaryRose Cusimano, 1050 Whitney Ranch Dr. #3023, Henderson, Nev. 89014

Filed Aug. 17, 1994, Ser. No. 296,013

Int. Cl.^{6} A61B *5/103*

U.S. Cl. 128—782 **20 Claims**



1. An integrated movement analyzing system comprising:

a) a surface electromyography (SEMG) cable assembly having on one end a cable connector and on the other end a set of electrodes, with each electrode having two skin contact points adapted to be attached to selected areas of a human patient, where each said SEMG electrode produces a differential analog signal representative of the resistance between the two skin contact points of the patient,

b) a range of motion arm (ROMA) having electrical circuit means and mechanical means for producing range of motion analog signals representative of the angular distance produced from selected areas of the patient,

c) a functional capacity sensor (FCS) having circuit means for producing a differential analog d-c signal representative of a pulling force exerted by the patient,

d) an integrated movement analyzer (IMA) comprising:

  (1) a surface electromyography section having circuit means for receiving and processing the analog signals from the electrodes attached to said SEMG cable assembly,

  (2) a range of motion section having circuit means for receiving and processing the analog signals from said ROMA,

  (3) a functional capacity section having circuit means for receiving and processing the analog signals from said FCS, and

  (4) an analog to digital converter (ADC) that receives and further processes the SEMG electrode, ROMA and FCS analog signals from said respective section,

e) an isolated power supply having circuit means for supplying the power requirements for operating the circuits of said integrated movement analyzing system, and

f) a computer and software program that receive the processed signals from said ADC for further processing and for the production of data representative of the patient's problems being analyzed.

5,462,066

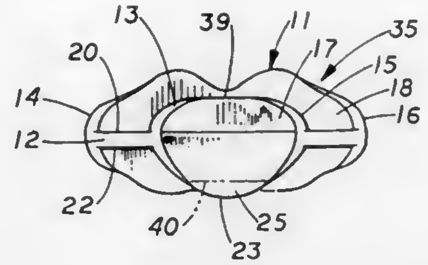
SNORING RELIEF DEVICE

David T. Snyder, 4007 Pretense Ct., Fair Oaks, Calif. 95628

Filed Feb. 10, 1994, Ser. No. 196,009

Int. Cl.^{6} A61F *5/37*

U.S. Cl. 128—848 **9 Claims**



1. A dental device for removable placement in the mouth of a wearer to inhibit snoring and sleep apnea, which device is made from any material which may be molded at a temperature higher than body temperature, but lower than a temperature which will burn the tongue and surrounding mouth tissue in order to conform said device to the wearer's dental impression and the surrounding mouth tissue, and which is adapted to fit around the wearer's teeth and surrounding gum tissue, and which device is further adapted to retain the lower jaw in a forward position during periods of sleep, which device comprises:

an outer wall spaced from an inner wall both of which are attached to a base to define a generally U-shaped channel member as seen from bottom and as seen from the top,

said channel member's outer and inner walls when taken with said base define an H-shaped member in elevation wherein,

each of said outer and inner walls have rearwardly diminishing elevations along said H-shape, both above and below the base;

said outer wall having a front region, which includes opposed upper concave and lower convex areas.

5,462,067

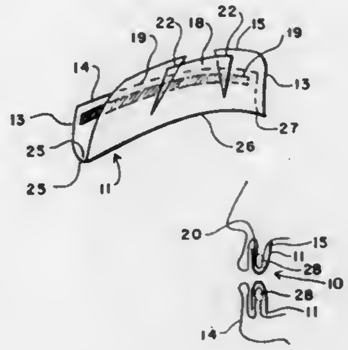
DEVICE FOR HYGIENIC PROTECTION OF THE TEETH AND GUMS

Ira Shapiro, P.O. Box 174, Radio City Station, New York, N.Y. 10101

Filed Aug. 18, 1994, Ser. No. 292,724

Int. Cl.^{6} A61F *5/56*

U.S. Cl. 128—861 **6 Claims**



1. A gum and teeth protector comprised of:

a) a piece of thin, initially flat polymeric film having a substantially rectangular perimeter defined by parallel end edges and straight parallel first and second edges of substantially equal length, said piece of film having two parallel slits beginning at said second edge and extending toward said first edge in orthogonal relationship thereto, said slits defining a center flap and paired outer flaps, the height of said piece of film, measured between said first and second edges being between 1½ to 2½ inches,

b) a compliant strip disposed in association with said first edge, and

c) adhesive means interactive between said center and outer flaps to securably overlap said center flap, thereby effectively shortening the length of said second edge.

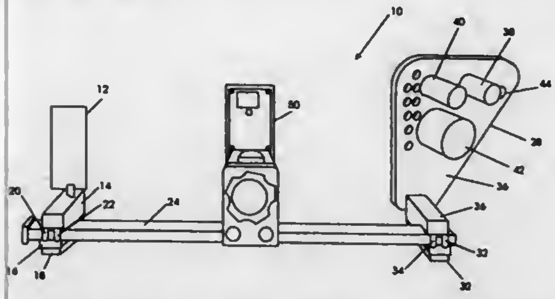
5,462,068
WRIST FIXATION DEVICE FOR ELBOW STRESS EXAMINATION

Arie M. Rijke, Charlottesville, Va., and Henry T. Goltz, St. Clair Shore, Mich., assignors to University of Virginia Patent Foundation, Charlottesville, Va.

Filed Feb. 19, 1993, Ser. No. 19,602

Int. Cl.^{6} H05G *1/00*

U.S. Cl. 128—881 **16 Claims**



1. A device for use in the evaluation of the medial elbow ligaments by positioning and stabilizing the hand, arm and shoulder of a subject, thereby positioning the elbow in a predetermined fixed position to allow for X-raying the elbow under graded pressure, comprising:

(a) a slide brace, said slide brace having a first end, a second end, a predetermined length and attachment means along said length,

(b) a vertical wrist fixation panel for receiving a patient's hand and wrist and securing the wrist in a predetermined position, said panel being slidably positioned proximate said first end of said slide brace and including:

a first roller positioned to be contacted by the palm of the hand,

a second roller, and

wrist securing means to hold said wrist in a predetermined position relative to said second roller,

(c) a shoulder brace for contacting the shoulder, said shoulder brace being slidably positioned proximate said second end of said slide brace, and

(d) pressure means for applying pressure to the radiohumeral joint to elicit widening of the medial joint space, said pressure means being slidably affixed to said slide brace, wherein said panel, shoulder brace and pressure means are at approximately right angles to said slide brace.

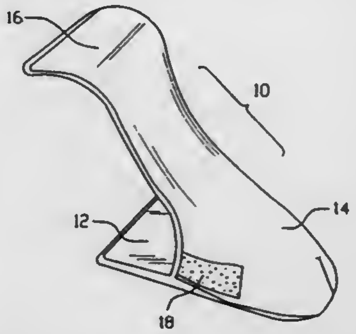
5,462,069
POST-SURGICAL TOE GUARD AND TONGUE

Jack Cohen, 811 Avenue S, Brooklyn, N.Y. 11223

Continuation of Ser. No. 956,178, Oct. 5, 1992, abandoned. This application Jul. 8, 1994, Ser. No. 272,901

Int. Cl.^{6} A61F *13/06;5/00*

U.S. Cl. 128—893 **18 Claims**



1. A post-surgical toe guard and integral tongue member to be worn inside a post-surgical boot or shoe, comprising:

a) a base section;

b) a one-compartment toe-covering section for covering all of the toes of the wearer in said one compartment, said toe-covering section connected to said base section to form a toe-receiving guard;

c) a tongue section integrally connected to said toe-covering guard and extending from said toe-covering section along the top surface of the upper foot; and

d) means on the exterior surface of said toe-covering guard for attaching said toe guard to the interior surface of a post-surgical shoe or boot.

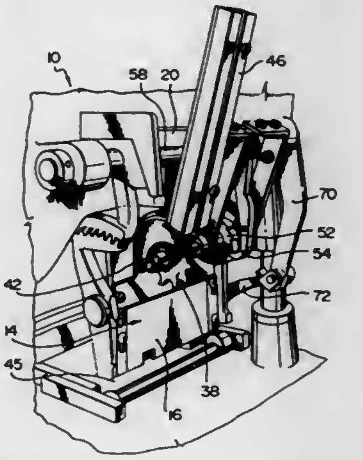
5,462,070
METHOD AND APPARATUS FOR MAKING A FILTER CIGAR PRODUCT

Budianto Rahardja, Kudus, Indonesia, assignor to P.T. Djarum, Bagian Produski Cerutu, Per Wakilan, Indonesia

Filed Jan. 18, 1994, Ser. No. 181,910

Int. Cl.^{6} A24C *1/00*

U.S. Cl. 131—76 **5 Claims**



1. A method of producing a cigar product having a cigar wrapping and having opposed ends and a filter therein, comprising the steps of:

providing a supply of cigar filters, tobacco filler and cigar wrapper material for forming a cigar product;

feeding a series of filters in sequence and placing each said filter within at least a portion of the cigar wrapper material;

selectively positioning said filter on said wrapper away from the ends of each said cigar wrapper and retaining said filter on said wrapper prior to the introduction of said tobacco filler;

dividing a charge of tobacco filler into two portions and introducing said tobacco filler portions onto said cigar wrapper material at both ends of said filter; and

wrapping a formed cigar with overwrap material and adhering a band member about said overwrap to identify the position of said filter.

5,462,071
COOLING SYSTEM FOR PRODUCTION UNITS IN PLANTS OF THE TOBACCO PROCESSING INDUSTRY

Uwe Heitmann, Hamburg, Germany, assignor to Hauni Maschinenbau AG, Hamburg, Germany

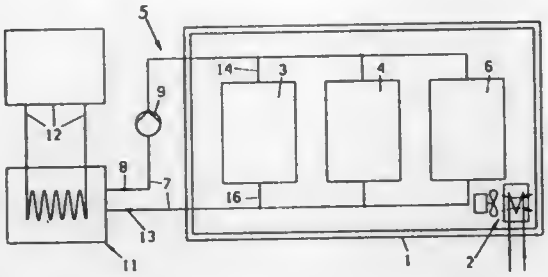
Filed Aug. 27, 1993, Ser. No. 113,401

Claims priority, application Germany, Aug. 28, 1992, 42 28 607.7

Int. Cl.^{6} A24C *5/00*

U.S. Cl. 131—280 **16 Claims**

1. A plant for making commodities of the tobacco processing industry, comprising at least one enclosure; means for conditioning



said at least one enclosure; at least one heat generating production unit in said at least one enclosure; and means for cooling said at least one unit, said cooling means having a portion located outside of said at least one enclosure and comprising a supply of liquid coolant and means for conveying the coolant along at least one predetermined path having at least one first section at said at least one unit and a second section within said portion of said cooling means.

5,462,072

REMOVAL OF NICOTINE FROM TOBACCO SMOKE

Colin L. Browne, Clover, S.C., and Raymond M. Robertson, Pineville, N.C., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Continuation of Ser. No. 731,965, Jul. 18, 1991, abandoned. This application Jan. 18, 1994, Ser. No. 183,107

Int. Cl.^{6} A24D *3/12*

U.S. Cl. 131—334 **5 Claims**

1. A method for selectively removing a component from tobacco smoke comprising steps of:

contacting a filter material with a tobacco smoke; and

filtering nicotine from the tobacco smoke with said filter material having disposed thereon a salt containing a metal having a valence of +2 selected from the group consisting of ferrous ammonium sulfate; cupric sulfate; cupric nitrate; cupric acetate; cobalt sulfate; cobalt nitrate; zinc sulfate; cadmium sulfate; nickel sulfate; magnesium acetate; mercuric acetate; mercuric chloride; and combinations thereof.

5,462,073

CIGARETTE HAVING WRAPPER MADE BY EXTRACTION AND PAPER-MAKING PROCESS

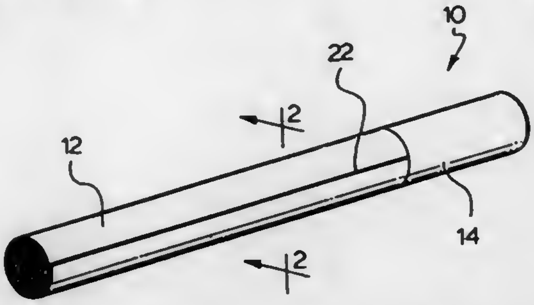
Larry Bowen, Orangeville; George E. Ayres, Campbellville; Gary Black, Brampton, and Jacques Daoust, St. Sophie, all of, Canada, assignors to Rothmans, Benson & Hedges Inc., North York, Canada

Continuation of Ser. No. 813,793, Dec. 26, 1991, abandoned. This application Jan. 18, 1994, Ser. No. 181,975

Claims priority, application United Kingdom, Jan. 5, 1991, 9100196; Feb. 14, 1991, 9103202; Apr. 24, 1991, 9108783; May 16, 1991, 9110559; Jul. 5, 1991, 9114598

Int. Cl.^{6} A24B *15/24;* **A24D** *1/02*

U.S. Cl. 131—374 **33 Claims**



1. A reconstituted tobacco sheet material useful as either or both the wrapper layer and binder layer of a smoking product, characterized by

(a) being formed by a paper-making process in which water-soluble material extracted in the sheet-making process is not added back to the sheet unless in an amount which does not exceed up to about 20 wt. % of reconstituted sheet,

(b) being comprised at least about 66 wt. % tobacco material,

(c) having a porosity of at least about 50 Coresta units,

(d) having a chalk-type filler content of about 10 to about 20 wt. %, and

(e) having a basis weight of less than about 35 g/m^2.

5,462,074

Patent Not Issued For This Number

5,462,075

METHOD AND DEVICE FOR CONTROLLING A FLOW OF FLUID

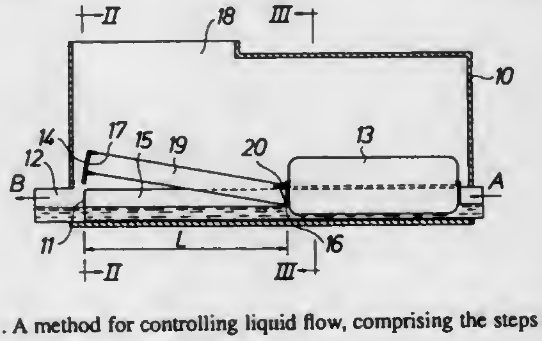
Mats Persson, Kremlevägen 7, S-374 40 Karlshamn, Sweden

PCT No. PCT/SE92/00843, § 371 Date Jun. 3, 1994, § 102(e) Date Jun. 3, 1994, PCT Pub. No. WO93/11313, PCT Pub. Date Jun. 10, 1993

PCT Filed Dec. 7, 1992, Ser. No. 244,546

Int. Cl.^{6} F16K *31/24;33/00*

U.S. Cl. 137—2 **14 Claims**

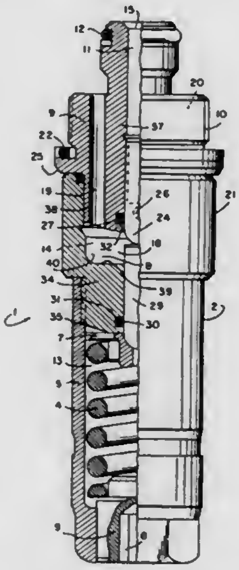


1. A method for controlling liquid flow, comprising the steps of:

- providing a well having a well inlet and a well outlet disposed in opposite ends of said well;
- positioning an inlet tube within said well, said inlet tube having a first end extending through said well inlet and having a second end disposed in aligned but spaced apart relation to said well outlet;
- positioning a floating body within said well in overlying relation to a first preselected length of said inlet tube;
- pivotally connecting a leading end of said floating body to a pivot point within said well so that said floating body pivots about said pivot point as a water level rises and falls within said well;
- connecting a trailing end of an elongate arm to said pivot point at a predetermined angle relative to said floating body so that said elongate arm pivots about said pivot point as said water level rises and falls within said well, said elongate arm overlying and extending along a second preselected length of said inlet tube;
- attaching an imperforate slide to a distal free end of said arm;
- selecting said first and second preselected lengths of said floating body and said elongate arm so that said imperforate slide is disposed above said second end of said inlet tube;
- whereby as water rises within said well, said floating body pivots about said pivot point, thereby causing said arm to pivot about said pivot point, thereby lowering said imperforate slide into covering relation to said second end of said inlet tube when the water level is rising within said well and raising said slide out of covering relation to said second inlet tube when the water level is falling within said well.

5,462,076
PRESSURE-COMPENSATED PRESSURE LIMITING VALVE

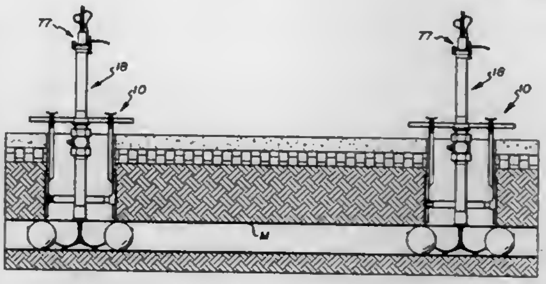
Richard Voss, Schwerte, Germany, assignor to Richard Voss Grubenausbau GmbH, Schwerte, Germany
Filed Sep. 26, 1994, Ser. No. 311,884
Claims priority, application Germany, Jun. 17, 1993, 43 19 967.4
Int. Cl.⁶ F16K *15/06*
U.S. Cl. 137—454.5 **22 Claims**



1. Pressure limiting valve for hydraulic support in underground mining and tunnel construction, comprising a tubular valve housing, a valve piston that is movable in a guide against force of a valve spring arranged and adjustable inside a spring chamber connected to the valve housing, and a water chamber constructed in the valve housing in front of the spring chamber for spraying off pressure medium through the water chamber when the valve piston responds, while bypassing the spring chamber, the water chamber extending in ring form around the valve piston that is exposed in this area, water chamber return bores leading from the water chamber to an exterior mantle and sealing rings for enabling a water-tight connection of a return line.

5,462,077
APPARATUS AND METHOD FOR SHUTTING OFF FLUID FLOW IN A PIPE MAIN

John H. Cohen; Curtis E. Leitko; Gerard T. Pittard; Terry P. Clifton, all of Houston, Tex., and Gerald Rockower, Brooklyn, N.Y., assignors to Brooklyn Union Gas Co., Brooklyn, and Consolidated Edison Company of New York, Inc., New York, both of N.Y.
Filed Mar. 31, 1994, Ser. No. 221,891
Int. Cl.⁶ F16K *43/00;* **F16L** *55/124*
U.S. Cl. 137—15 **34 Claims**



1. A method for stopping the flow of fluid in a pipe main buried in soil while repairs are being made to the main comprising the steps of;

- excavating said soil to a depth to expose only a portion of said pipe main exterior surface of sufficient area to receive the lower end of a hollow tubular member,
- installing a support member horizontally across the excavation above said pipe main and anchoring opposite ends of said support member to opposed sides of the excavation,
- placing the lower end of a hollow tubular member against the exposed exterior surface of said pipe main to extend radially therefrom,
- releasably connecting the radially extending upper portion of said hollow tubular member to said anchored support member to extend longitudinally between said pipe main and said anchored support member and to move relative thereto in the longitudinal direction,
- applying a force along the longitudinal axis of said hollow tubular means against said anchored support member to force the lower end of said hollow tubular member downward relative thereto and compress the lower end of said elongate hollow tubular member against the exposed exterior surface of said pipe main to effect a fluid sealing relation therebetween,
- inserting a cutting tool through said hollow tubular member and cutting a hole through the exposed exterior surface of said pipe main and thereafter removing said cutting tool and the cut material,
- inserting a bladder deployment tool through said hollow tubular member, said deployment tool containing at least one retractable inflatable bladder in a deflated condition connected with a source of fluid under pressure,
- deploying said at least one bladder into the interior of said pipe main and applying fluid under pressure to said at least one bladder to inflate said at least one bladder to expand and engage the interior surface of said pipe main in a fluid sealing relation to prevent fluid in said pipe main from leaking past said at least one inflated bladder while repairs are being made to said pipe main,
- after repairs have been made to said pipe main, deflating said at least one bladder and retracting it inside said bladder deployment tool and then removing said bladder deployment tool, and thereafter

disconnecting said hollow tubular member from said anchored support member and removing said hollow tubular member from the exposed exterior surface of said pipe main.

5,462,078

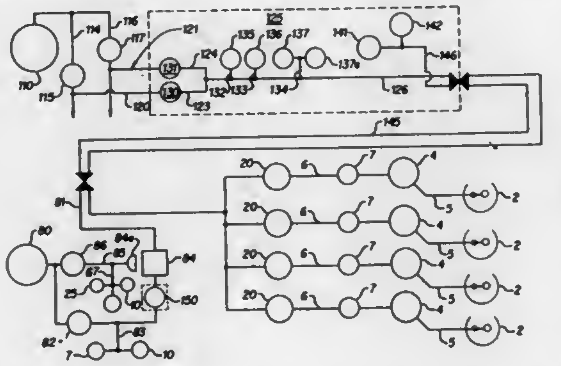
APPARATUS FOR ELIMINATING HAZARDOUS MATERIALS FROM CARGO TANK WET LINE

Roy W. Andenmatten, 10 Eva La., Farmingville, N.Y. 11738, and Ronald P. Andenmatten, 27 Otsego Ave., Dix Hills, N.Y. 11746

Division of Ser. No. 973,487, Nov. 9, 1992, Pat. No. 5,377,715. This application Jun. 27, 1994, Ser. No. 266,193

Int. Cl.^{6} B67D *5/01*

U.S. Cl. 137—209 **54 Claims**



1. An apparatus for purging residual liquid from a cargo tank external loading line of a cargo tank vehicle after a cargo tank compartment associated with the cargo tank external loading line has been loaded, which comprises:

(a) means for closing off both an inlet end and an outlet end of the cargo tank external loading line to provide a generally sealed chamber within the cargo tank external loading line;

(b) a source of pressurized gas in flow communication with the generally sealed chamber within the cargo tank external loading line;

(c) flow enabling means for permitting, when desired, flow of pressurized gas from the source of pressurized gas to the generally sealed chamber within the cargo tank external loading line; and

(d) a purging conduit having an inlet end in flow communication with the generally sealed chamber within the cargo tank external loading line and an outlet end in flow communication with the cargo tank compartment such that during the purging operation the flow of pressurized gas from the source of pressurized gas to the generally sealed chamber within the cargo tank external loading line forces the residual liquid out of the cargo tank external loading line through the purging conduit and into the cargo tank compartment.

5,462,079

ANTI-SIPHON MIXING VALVE

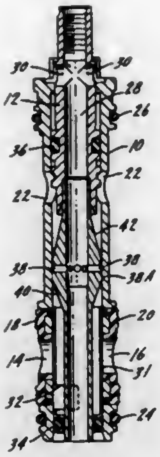
Todd C. Loschelder, Macedonia, and Erwin F. Mikol, Westlake, both of Ohio, assignors to Moen Incorporated, North Olmsted, Ohio

Filed Dec. 5, 1994, Ser. No. 349,552

Int. Cl.^{6} F16K *24/02;11/078*

U.S. Cl. 137—216 **8 Claims**

1. A hot and cold water mixing valve including a sleeve having a hot water inlet and a cold water inlet spaced therefrom, discharge opening means in said sleeve axially spaced from said inlets, a stem movable within said sleeve to control water flow from said inlets to said discharge means, water passage means between the exterior of said stem and the interior of said sleeve connecting said inlets and said discharge means, an axially extending air passage within said stem and having an outer end thereof in communication with air at ambient pressure, air outlets in said stem intermediate the ends thereof and connecting said air passage with the exterior of said stem, and cooperating means on the interior of said sleeve and the exterior of said stem limiting the area of said water passage means adjacent said air outlets to provide a venturi to draw air from said air outlets into said water passage means.



5,462,080

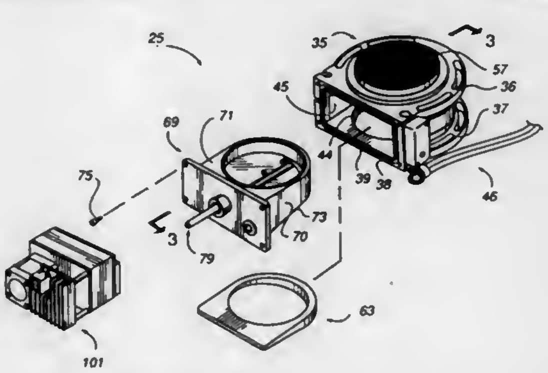
HEATED REMOVABLE THROTTLE VALVE

Richard W. Plavidal, Los Gatos; Petru N. Nitescu, Milpitas; Greg Mudwilder, San Jose, and Richard Crockett, Milpitas, all of Calif., assignors to Applied Materials, Inc., Santa Clara, Calif.

Filed Aug. 31, 1993, Ser. No. 114,893

Int. Cl.^{6} F16K *49/00*

U.S. Cl. 137—337 **13 Claims**



1. A valve comprising:

an outer housing having a fluid flow bore therethrough, a side opening, and a top inner surface generally parallel to a bottom inner surface;

a wedge having a fluid flow bore therethrough configured to be supported on said bottom inner surface of said outer housing, said wedge being tapered at a first predetermined angle;

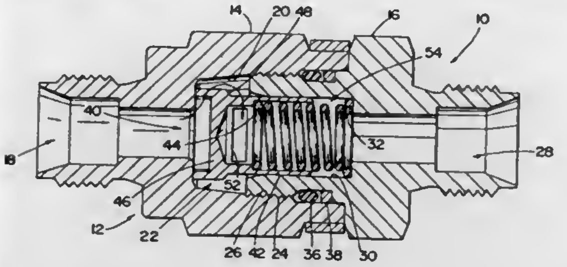
an inner housing having a fluid flow bore therethrough, said inner housing having a top side and a bottom side, wherein said bottom side is tapered with respect to said top side at said first predetermined angle, when said inner housing is placed in said outer housing said wedge is in contact with said bottom tapered side of said inner housing, said fluid flow bore of said inner housing having an adjustable flow restricting barrier therein, such that when said inner housing is disposed so as to seal said side opening of said outer housing, said fluid flow bore of said outer housing communicates with said fluid flow bore of said inner housing such that there is a substantially tight fit between said inner housing and said outer housing to substantially prevent the passage of fluid through said fluid flow bore of said outer housing without the fluid also passing through said fluid flow bore of said inner housing.

5,462,081
EXCESS FLOW VALVE

Robert V. Perusek, Euclid; Ulrich H. Koch, Chagrin Falls, and Gregory S. Kalata, Parma, all of Ohio, assignors to Nupro Company, Willoughby, Ohio

Filed Aug. 24, 1994, Ser. No. 295,205
Int. Cl.^{6} F16K *17/24*

U.S. Cl. 137—498 **15 Claims**



1. A poppet type excess flow valve comprising:
a) a body forming a valve chamber having a first end defining an inlet port and a second end defining an outlet port, the valve chamber having a first portion of a first diameter adjacent the first end and a second portion of a second diameter adjacent the second end, the second diameter being smaller than the first diameter;
b) a valve seat between the first and second portions of the valve chamber, the valve seat formed by a radially extending shoulder defining the junction between the first and second portions of the valve chamber;
c) a poppet element in the valve chamber, the poppet element including a first section in the form of a hollow cylindrical body extending into the second portion of the valve chamber and terminating therein in an open end, the outer diameter of the hollow cylindrical body section being only slightly less than the diameter of the second portion of the valve chamber for guided sliding movement therein, the poppet element further including a second section located in the first portion of the valve chamber and joined to the first section, the second section including an end wall carrying a circumferentially continuous valving surface extending radially outward to a diameter greater than the diameter of the second portion of the valve chamber for cooperation with the valve seat;
d) a compression coil spring means received in the first section of the poppet element and extending out of the open end into engagement with the body about the outlet port for maintaining the poppet element continually biased under a predetermined force toward the inlet port; and,
e) flow passages formed through the hollow cylindrical body portion of the poppet element at a location closely adjacent the valving surface of the second section.

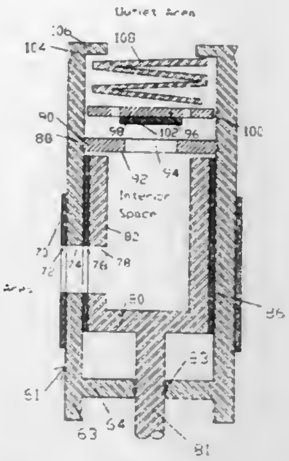
5,462,082
BACKFLOW PREVENTER WITH FAILURE INDICATOR

Thomas J. Lauria, 398 Mayer Ct., Ridgefield, N.J. 07657

Filed Oct. 7, 1994, Ser. No. 319,978
Int. Cl.^{6} F16K *15/18*

U.S. Cl. 137—557 **8 Claims**

1. A means for testing a backflow prevention device comprising:
a) fluid flow path;
b) check valve means in said fluid flow path including means to disable the check valve function;
c) means which allows fluid pressure from an inlet area to an interior space to test said check valve means in said fluid flow path; and



d) means for testing said check valve means, wherein said means which allows fluid pressure from an inlet area to an interior space to test check valve means is a valve.

5,462,083
ROTARY PASSAGE

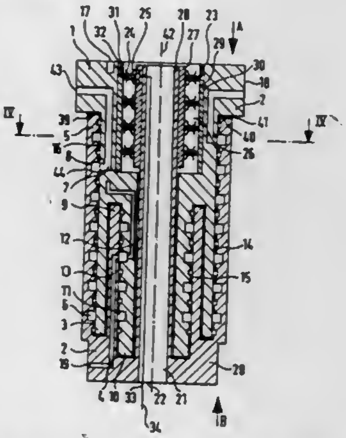
Ernst Kaspar, Munderkingen, Germany, assignor to EC Engineering + Consulting Spezialmaschinen GmbH, Ulm, Germany

Filed Dec. 16, 1994, Ser. No. 357,018

Claims priority, application Germany, Jan. 18, 1994, 9400767 U

Int. Cl.^{6} F16L *27/08*

U.S. Cl. 137—580 **19 Claims**



1. A rotary passage for passing liquids and/or other media between a rotary member and a stationary member, characterized in that an outer stationary hollow-cylindrical section and an outer rotary hollow-cylindrical section, an inner stationary hollow-cylindrical section and an inner rotary (hollow) cylinder are arranged in said rotary passage from the outside to the inside in pairs and in lamellarly interlaced fashion, wherein a first rotary passage stage is formed in that the sliding surface of said outer hollow-cylindrical section of said stationary member is in engagement with a sliding surface of said outer hollow-cylindrical section of said rotary member, and that said sliding surfaces have provided thereon a plurality of horizontal annular channels which extend in parallel with one another and interconnect first feed lines of said rotary member to first discharge lines of said stationary member, that a second rotary passage stage is formed in that a sliding surface of said inner hollow-cylindrical section of said stationary member is in engagement with a sliding surface of said inner hollow-cylindrical section of said rotary member, and that said sliding surfaces in said inner hollow-cylindrical section have provided thereon a plurality of horizontal annular channels which

extend in parallel with one another and interconnect second feed lines of said rotary member to second discharge lines of said stationary member, and that all of said annular channels of said two rotary passage stages have each assigned thereto upper and lower insulation means on said sliding surface.

5,462,084
QUICK-ACTING COUPLING

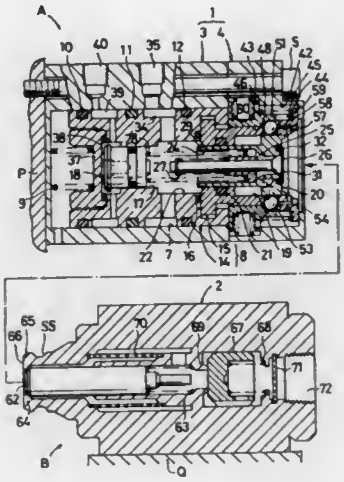
Akira Arisato, Kobe, Japan, assignor to Kabushiki Kaisha Kosmek, Hyogo, Japan

Filed Feb. 14, 1994, Ser. No. 388,516

Claims priority, application Japan, Mar. 1, 1994, 6-030736

Int. Cl.^{6} F16L *37/28*

U.S. Cl. 137—614.03 **7 Claims**



1. A quick-acting coupling including a first coupling (A) and a second coupling (B) adapted to be faced and connected to each other, which coupling comprising:

- a first housing (1) having an axis, a first leading end and a first base end and arranged in the first coupling (A);
- a cylindrical case (8) having a bore (22) and inserted hermetically into the first housing (1) to be able to move in the axial direction;
- a sliding cylinder (20) inserted hermetically into the bore (22) to be able to move in the axial direction;
- a first closing member (26) inserted into the sliding cylinder (20) to be able to move in the axial direction;
- an advancing means (9) for urging the cylindrical case (8) toward the first leading end;
- a second housing (2) having a second leading end and a second base end and arranged in the second coupling (B);
- a pushing member (65) arranged at the second leading end of the second housing (2) to push the sliding cylinder (20) toward the first base end at the time of connection of both the couplings (A) (B);
- a second closing member (62) inserted into the second housing (2) to be pushed toward the second base end by the first closing member (26) at the time of connection of both the couplings (A) (B);
- an engagement means (51) for connecting and disconnecting the cylindrical case (8) and the second housing (2) to and from each other; and
- a clearance (N) provided between the cylindrical case (8) and the first housing (1) for allowing the cylindrical case (8) to move toward the first base end at the time of completion of the connection of both the couplings (A) (B).

5,462,085
FOUR-WAY CHANGE-OVER VALVE FOR AIR-CONDITIONER AND SERVICE VALVE THEREWITH

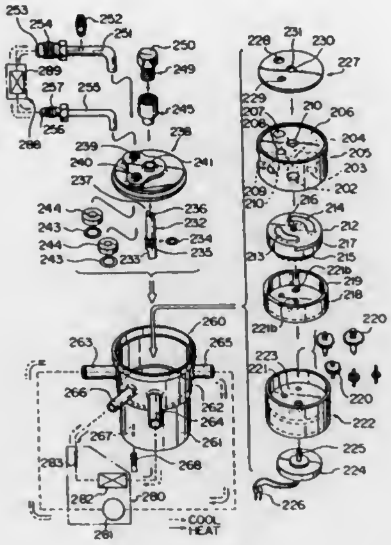
Toshinori Iwata, Motosu, and Manabu Ota, Ogaki, both of, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Nov. 5, 1993, Ser. No. 147,775

Claims priority, application Japan, Jan. 25, 1993, 5-005392 U; Feb. 27, 1993, 5-063525; Mar. 18, 1993, 5-085627; Mar. 23, 1993, 5-089308; Mar. 23, 1993, 5-089309

Int. Cl.^{6} F25B *13/00*

U.S. Cl. 137—625.43 **6 Claims**

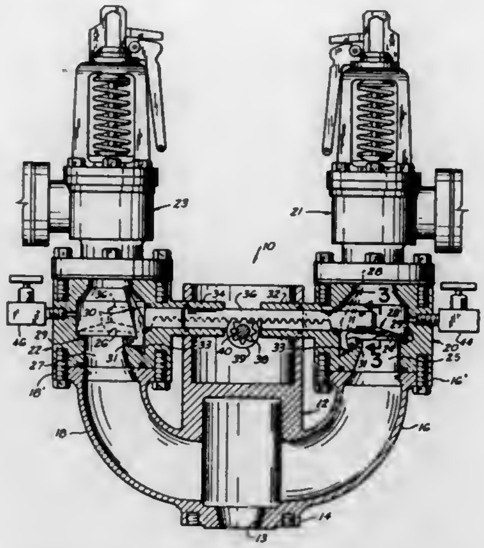


1. A service valve with a four-way change-over valve for an air conditioner, comprising:

- a valve seat formed in a thick disk shape;
- three first piping holes penetrating said valve seat, each of said first piping holes having a first opening located on one plane surface of said valve seat and a second opening located on a circumferential side surface of said valve seat;
- a second piping hole penetrating said valve seat, said second piping hole having a first opening located on said one plane surface of said valve seat and a second opening located on an other plane surface of said valve seat, said first openings of said first and second piping holes being sequentially arranged on a concentric circle at predetermined angular distances on said one plane surface;
- a third piping hole penetrating said valve seat, said third piping hole having a first opening located on said circumferential side surface of said valve seat and having a second opening located on said other plane surface of said valve seat, said second openings of said second and third piping holes being sequentially arranged on a concentric circle on said other plane surface;
- a rotary valve abutting to said one plane surface of said valve seat and having two symmetric communicating grooves, each groove selectively communicating with each other two adjacent openings of said first openings of said first and second piping holes so as to switch cooling and heating operations of said air conditioner by a rotation of said rotary valve;
- a shutter cover disposed above said other plane surface of said valve seat and having two fourth piping holes respectively corresponding to said second openings of said second and third piping holes; and
- a disk shutter rotatably disposed between said shutter cover and said other surface of said valve seat and having two through holes respectively corresponding to said second openings of said second and third piping holes for selectively communicating said fourth piping holes with said second openings of said second and third piping holes.

5,462,086
SELECTOR RELIEF VALVE ASSEMBLY

Julian S. Taylor, and Christopher F. Rooney, both of 8300 SW. 8th, Oklahoma City, Okla. 73128
Filed Nov. 7, 1994, Ser. No. 335,237
Int. Cl.^{6} F16K *11/10*
U.S. Cl. 137—865 **12 Claims**



1. A selector relief valve assembly, comprising:

a generally Y-shaped tubular body having a stem forming a stem inlet port adapted to be connected in fluid communication with a fluid containing line and having a pair of legs diverging from the stem opposite the inlet port for forming spaced-apart legs having downstream end portions and an outlet port for each leg of said pair of legs opposite the inlet port and a fluid passageway between the inlet .port and respective outlet port;

an annular valve seat in the downstream end portion of each leg passageway of said pair of legs facing the respective outlet port;

a valve supported by each leg of said pair of legs for movement toward and away from the respective valve seat; and,

rack and pinion means including a pinion supported by said body and a rack having a predetermined length extending between said pair of legs for movement of said rack toward a selected valve and biasing the latter closed.

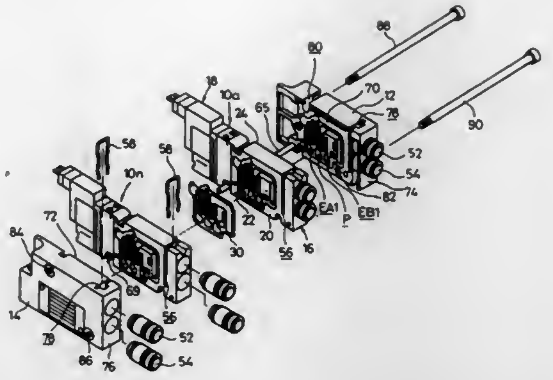
5,462,087
DIRECTIONAL CONTROL VALVE AND A VALVE ASSEMBLY USING DIRECTIONAL CONTROL VALVES

Yoshihiro Fukano; Shoichi Makado, and Takeshi Arakawa, all of Ibaraki, Japan, assignors to SMC Kabushiki Kaisha, Tokyo, Japan
Filed May 5, 1994, Ser. No. 238,727
Claims priority, application Japan, May 7, 1993, 5-029283 U; May 11, 1993, 5-132938
Int. Cl.^{6} F15B *13/08*
U.S. Cl. 137—884 **8 Claims**

1. A valve assembly comprising:

a plurality of directional control valves substantially identical in shape, each of said plurality of directional control valves having at least one open connecting groove and at least one engaging groove which opens on a surface thereof and penetrates in a direction in which the directional control valves are linked together, said engaging groove having an engaging spring which protrudes thereinto;

first and second end plates for joining together the directional control valves at respective ends of the plurality of directional control valves, said first and second end plates having at least one fastening means;

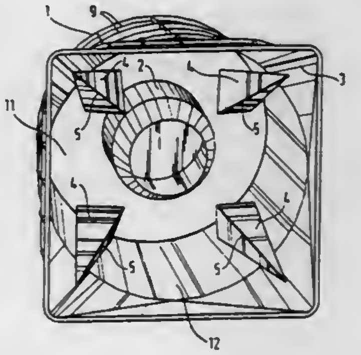


at least one clamping member to be fitted into said open connecting groove and to be fastened to said fastening means for integrally linking together said plurality of directional control valves and said first and second end plates; and

at least one connecting pin member to be resiliently held in a space defined by said engaging groove and said engaging spring for linking together the directional control valves.

5,462,088
GAS TURBINE EXHAUST DIFFUSER

Jacques Poux, Grenoble; Liberto Gandia, Blevilliers, and Frédéric Rouget, Valdole, all of, France, assignors to Societe Anonyme Dite: European Gas Turbines SA, Paris, France
Filed Oct. 25, 1993, Ser. No. 140,394
Claims priority, application France, Jan. 26, 1992, 92 12724
Int. Cl.^{6} F15D *1/08*
U.S. Cl. 138—39 **10 Claims**



1. A diffuser for diffusing exhaust gases from a gas turbine, the diffuser being inserted downstream from a last expansion stage constituted by an outlet duct of circular cross-section containing a central bulb, said diffuser comprising:

a flared transition duct having an inlet end of circular cross-section identical to the circular cross-section of the outlet duct of the last expansion stage, and an outlet end of square cross-section; and

fins supported on an inside wall of at least one of said ducts and spaced therefrom for directing a portion of the exhaust gases between said fins and the outlet duct and said transition duct towards the corners of the square cross-section.

5,462,089

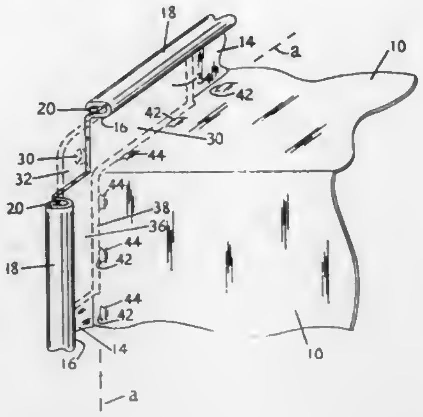
SHEET METAL DUCT CONSTRUCTION PROVIDING PRELIMINARY SUPPORT FOR CORNER CRIMPING

Lamont R. McClain, St. Louis, Mo., assignor to Engel Industries, Inc., St. Louis, Mo.

Continuation-in-part of Ser. No. 126,491, Sep. 24, 1993, Pat. No. 5,358,013. This application Oct. 24, 1994, Ser. No. 327,565

Int. Cl.^{6} F16L *23/00;25/00*

U.S. Cl. 138—109 **1 Claim**



1. A rectangular sheet metal duct section having at each end integral outwardly bent end flanges to be joined by crimping within them right angle cornerpieces, said outwardly bent end flanges each comprising

a first flange portion bent outward from and substantially perpendicular to the surface of such duct section,

a second flange portion continuing from said first flange portion and bent back substantially parallel to the duct surface, and at a spacing therefrom sufficient for fitting therebetween the arm of such cornerpiece,

a third flange portion of substantially the same extent as said second flange portion and being bent reversedly to said second portion and spaced therefrom not less than the thickness of such sheet metal, and

a fourth flange portion bent reversedly inward from said third portion and presented substantially adjacent to an outer surface part of said second portion, said fourth flange portion constituting a margin of the sheet metal from which said flange is formed, the edge of which margin being positioned in the reverse bend between said second and third flange portion, in combination with

means embossed on the duct surface for lodging such cornerpiece in position for crimping said second flange portion thereover, said means including a plurality of embossed duct wall surface portions projecting in a linear array spacedly from and adjacent to the said outward bend of said first flange portion,

whereby, when the inner edge of an arm of such cornerpiece is manually pressed into position between said embossed array and against said first flange portion, such arm will be lodged in position for subsequent crimping of said second flange portion over it.

5,462,090

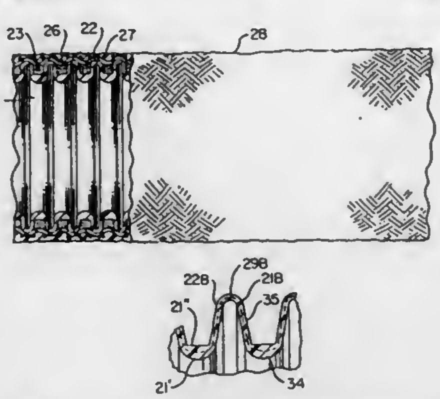
FLEXIBLE HOSE CONSTRUCTION HAVING AN INNER CORRUGATED HOSE MADE OF POLYMERIC MATERIAL

Jeffrey J. Winter, Ocala, Fla.; Homer N. Holden, Sylva, N.C., and James L. Lawrence, Ocala, Fla., assignors to Dayco Products, Inc., Dayton, Ohio

Division of Ser. No. 99,276, Jul. 29, 1993, Pat. No. 5,383,497, which is a division of Ser. No. 906,814, Jun. 30, 1992, Pat. No. 5,256,233, which is a division of Ser. No. 759,023, Sep. 13, 1991, Pat. No. 5,145,545, which is a continuation of Ser. No. 405,487, Sep. 11, 1989, Pat. No. 5,089,074. This application Oct. 20, 1994, Ser. No. 326,679

Int. Cl.^{6} F16L *11/11*

U.S. Cl. 138—121 **4 Claims**



1. In a flexible hose construction comprising an inner corrugated hose made of polymeric material and having a plurality of outwardly convex projections with recesses therebetween, an outer sleeve of reinforcing material disposed in telescoping relation on said inner corrugated hose, and an outer sleeve of polymeric material disposed in telescoping relation on said sleeve of reinforcing material, the improvement comprising a tube of polymeric material disposed between said sleeve of reinforcing material and said inner corrugated hose and extending in a generally straight-line manner from projection to projection of said inner corrugated hose so as to tend to prevent said sleeve of reinforcing material from entering into said recesses of said inner corrugated hose an amount that would tend to substantially reduce the flexibility characteristics of said inner corrugated hose, said tube having been extruded onto said inner corrugated hose before said sleeve of reinforcing material was disposed thereon, said tube having substantially constant inner and outer diameters, said inner corrugated hose having been formed from thermoplastic material, said tube of polymeric material having been formed from thermoplastic material, said outer sleeve of polymeric material having been formed from thermoplastic material, said tube of polymeric material having been bonded to said projections of said inner corrugated hose by the extruding thereof, said sleeve of polymeric material having been bonded to said tube of polymeric material through said sleeve of reinforcing material by said sleeve of polymeric material having been extruded onto said sleeve of reinforcing material whereby said tube of polymeric material holds said sleeves and said hose together, said inner corrugated hose having been formed by extruding a tubular member from said polymeric material thereof and then blow molding said tubular member into said inner corrugated hose.

5,462,091

ADHESION OF HALOPOLYMERS TO NYLON

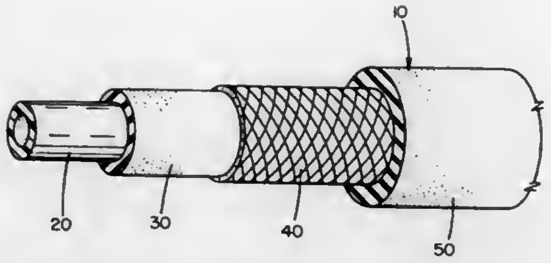
Timothy P. Saupe, DeForest, Wis., assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Sep. 9, 1993, Ser. No. 118,344

Int. Cl.^{6} F16L *11/04*

U.S. Cl. 138—126 **10 Claims**

1. A curable composition of a halopolymer capable of exhibiting in a cured state an improved adhesion to a polyamide comprising



100 parts of a halopolymer compounded with a bis-dienophile as a crosslinker, alkali/or alkaline earth oxide, a curative selected from the class consisting of a peroxide and a sulfur curative, about 25 to about 70 parts of carbon black and about 8 to about 70 parts of talc.

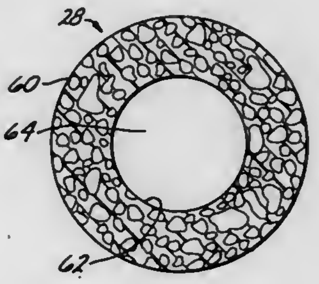
5,462,092
POROUS PIPE AND PROCESS FOR PRODUCING SAME

James J. Franz, Monarch Beach, Calif., and Richard A. Hutchinson, San Antonio, Tex., assignors to Subsurface Technology Corporation, Dana Point, Calif.

Division of Ser. No. 896,510, Jun. 8, 1992, Pat. No. 5,334,336, which is a continuation of Ser. No. 368,240, Jun. 19, 1989, abandoned. This application Mar. 23, 1994, Ser. No. 216,641

Int. Cl.^{6} F16L *11/04;* **A01G** *27/00*

U.S. Cl. 138—177 **20 Claims**



1. An extrudable mixture comprising elastomer particles, binder component and a solid water carrier component having a composition other than said elastomer particles and said binder component and being associated with a sufficient amount of water to provide porosity to a porous article produced by extruding said extrudable mixture, said water associated with said solid water carrier component being more than about 50% by weight of the total blowing agent present in said extrudable mixture.

5,462,093
DAMPER DEVICE FOR WEAVING MACHINE OSCILLATING MEMBERS

Jean-Paul Froment, Doussard, France, assignor to S.A. des Etablissements Staubli (FRANCE), Faverges, France

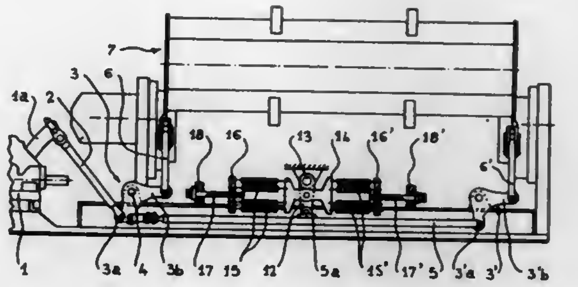
Filed May 31, 1994, Ser. No. 251,257

Claims priority, application France, Jun. 3, 1993, 93 06882

Int. Cl.^{6} D03C *9/00*

U.S. Cl. 139—57 **13 Claims**

1. A motion damping system for use in a weaving machine having at least one movable member which is continuously moved in an oscillating motion to and from a median position to manipulate yarn being woven and which motion is controlled by a control means connected to the movable member to impart the oscillating motion thereto, the damping system comprising, a pair of opposing elastic means, and means for connecting said pair of elastic means to the movable member to apply oppositely directed force thereto to continuously urge the movable member toward the median position.



5,462,094
SENSOR ACTIVATED WEFT TENSION DEVICE

Paer Josefsson, Borås; Kurt A. G. Jacobsson, and Lars H. G. Tholander, both of Ulricehamn, all of, Sweden, assignors to IRO AB, Ulricehamn, Sweden

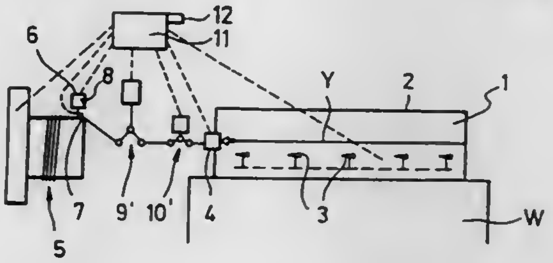
PCT No. PCT/EP92/02203, § 371 Date Jul. 5, 1994, § 102(e) Date Jul. 5, 1994, PCT Pub. No. WO93/06278, PCT Pub. Date Apr. 1, 1993

PCT Filed Sep. 23, 1992, Ser. No. 211,350

Claims priority, application Germany, Sep. 23, 1991, 41 31 656.8

Int. Cl.^{6} D03D *47/34*

U.S. Cl. 139—194 **16 Claims**



1. A method of controlling the insertion process of a weft yarn into a shed of a loom having a reed which is adapted to be moved for a beating up, said method comprising the steps of accelerating the weft yarn during the insertion process from a condition of standstill at one boundary edge of the woven fabric, transporting the weft yarn through the shed and stopping said weft yarn, and further comprising the steps of exposing the weft yarn temporarily to a braking friction and mechanically detecting the yarn tension at the weft yarn by a tension sensor, comprising the improvement wherein said tension sensor is moved from a passive position spaced part from said weft yarn to a detection position in contact with said yarn for said detecting of said yarn tension and wherein the yarn tension is detected temporarily during the insertion process.

5,462,095
PICKING DEVICE WITH SELECTED SPOOLS FOR A WATER-JET LOOM

Masahiro Okesaku, Ishikawa, Japan, assignor to Hokuriku Seikei Industrial Co., Ltd., Ishikawa, Japan

Filed Feb. 2, 1994, Ser. No. 190,821

Claims priority, application Japan, Feb. 8, 1993, 5-044469; Apr. 30, 1993, 5-103948; Nov. 19, 1993, 5-338757

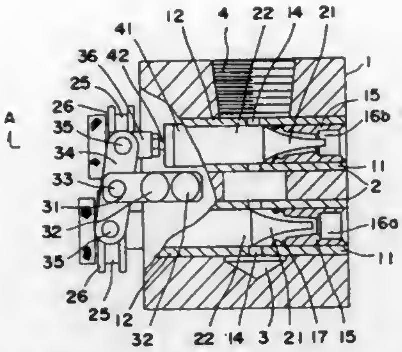
Int. Cl.^{6} D03D *47/32*

U.S. Cl. 139—435.4 **8 Claims**

1. A picking device for a water-jet loom, said picking device comprising:

a nozzle body provided with a plurality of axial nozzle holes having front ends, and a fluid supply passage connected to a pressurized fluid source;

a plurality of spools, each having a front end and an axis, each spool provided with an axial through-hole through which a



weft yarn advances, and each spool supported for axial sliding movement within the nozzle body;

orifice chips fixedly fitted in the front ends of the axial nozzle holes so as to form straightening flow passages between the orifice chips and the front ends of the corresponding spools, respectively, said orifice chips having orifices; and

a spool driving mechanism for individually or sequentially reciprocating the spools along their axes to open and close fluid passages through which the pressurized fluid flows from the fluid supply passage into the orifices of the orifice chips.

5,462,096
MEASURING WEFT FEEDER WITH YARN CLAMPING ACTION

Anders Svanstroem, Ulricehamn, and Paer Josefsson, Borås, both of, Sweden, assignors to IRO AB, Ulricehamn, Sweden

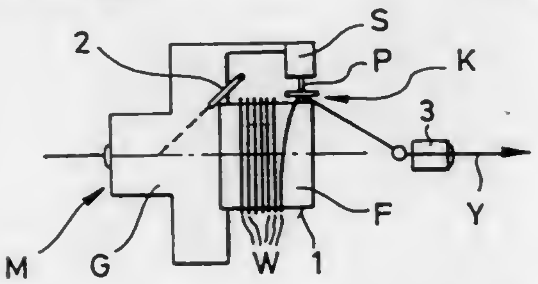
PCT No. PCT/EP92/01927, § 371 Date Jul. 5, 1994, § 102(e) Date Jul. 5, 1994, PCT Pub. No. WO93/04225, PCT Pub. Date Mar. 4, 1993

PCT Filed Aug. 21, 1992, Ser. No. 199,234

Claims priority, application Germany, Aug. 22, 1991, 41 27 798.8

Int. Cl.^{6} D03D *47/36*

U.S. Cl. 139—452 **11 Claims**



1. A measuring weft feeder comprising a storage body defining a storage surface for a yarn wound in turns thereon, and further comprising at least one stopping device associated with said storage body and cooperating therewith to define a passage slot therebetween for the yarn, said stopping device including a stopping element which is movable transversely through the passage slot from a nonstopping position to a stopping position so as to act as a circumferential stop for the yarn, the improvement wherein the stopping device is provided with a yarn clamp for the yarn caught at the stopping element, said stopping device including displacement means for displacement of said yarn clamp from a position of rest to a clamping position lying in the passage slot, said displacement means including means for maintaining said clamp in the position of rest when the stopping element is in the nonstopping position to allow the yarn to be freely unwound off of the storage body, said displacement means further including means for displacing said clamp into said clamping position when the stopping element moves or has moved through the passage slot into the stopping position for directly clamping the yarn with said clamp at the side of and adjacent to the stopping element.

5,462,097
PIEZOELECTRIC DEVICES FOR YARN CONTROL APPARATUS IN A TEXTILE MACHINE

Ivan Skalka, Vsetin, Czech Rep., assignor to Textilma AG, Hergiswil, Switzerland

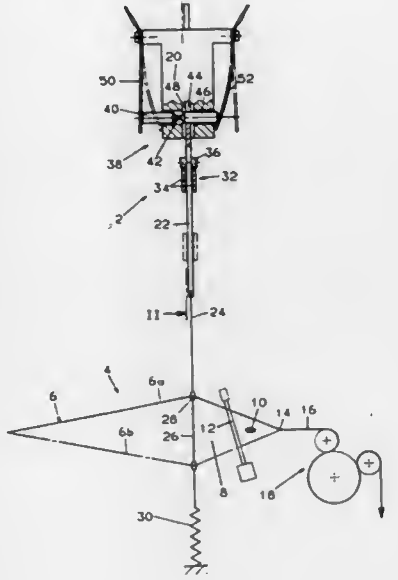
PCT No. PCT/CH93/00239, § 371 Date Jun. 6, 1994, § 102(e) Date Jun. 6, 1994, PCT Pub. No. WO94/09197, PCT Pub. Date Apr. 28, 1994

PCT Filed Oct. 7, 1993, Ser. No. 244,652

Claims priority, application Czech Rep., Jan. 9, 1992, 2094-93

Int. Cl.^{6} D03C *3/20;13/00;* **D04B** *27/32*

U.S. Cl. 139—455 **13 Claims**



1. A control device for a yarn of a textile machine, said control device comprising:

a traction member connectable to the yarn;

means for lifting the traction member from a first position thereof corresponding to a low position of the yarn to a second position thereof corresponding to a high position of the yarn; and

coupling means for retaining the traction member in the second position thereof, the coupling means including:

- a link pin receivable in an opening formed in the traction member and displaceable between a neutral position, in which the traction member is capable of being displaced between the first and second positions thereof, and an engaged position, in which the traction member is retained in the second position thereof, and
- first and second piezoelectric switching members for displacing the link pin between the neutral and engaging positions thereof upon application of current to a respective one of the first and second piezoelectric switching members, the respective one of the first and second piezoelectric switching members being engageable by the link pin in a respective one of the neutral and engaging positions thereof and, in absence of application of current thereto, generating a signal indicative of a position of the link pin, thus functioning as a sensor.

5,462,098
AUTOMATIC TIGHTENER

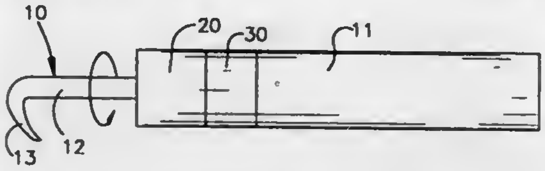
Saburo Murakami, 11-3-1115, Shimono-cho 2-chome, Kishiwada-shi, Osaka, Japan

Filed Nov. 3, 1993, Ser. No. 147,064

Claims priority, application Japan, Jan. 17, 1991, 3-269621

Int. Cl.^{6} B21F ***15/04***

U.S. Cl. 140—119 **2 Claims**



1. An automatic tightener for tightening binding wires comprising: a tightening member for engaging binding wires, drive means for rotationally driving said tightening member, a clutch mechanism disposed between said tightening member and said drive means for preventing transmission of the driving force from said drive means to said tightening member when a torque above a predetermined amount is applied to said tightening member, a mechanism for stopping said tightening member at a predetermined position during rotation of said tightening member in a tightening direction, a housing portion, and a rotatable portion which is rotatable relative to said housing portion upon rotation of said tightening member, said mechanism for stopping including a first lug means connected to said housing portion for providing a stopping surface, a second lug means connected to said rotatable portion for rotation with said rotation portion and for engaging said first lug means when said tightening member is moved to the predetermined position, said second lug means being axially moveable relative to said first lug means for permitting said second lug means to rotate past said first lug means without engaging said first lug means and a bias means for axially biasing said second lug means toward said first lug means, said bias means being overcome by an axial force applied by an operator during the tightening of the wires.

5,462,099
SYSTEM AND METHOD FOR PRESSURIZING DISPENSING CONTAINERS

Scott W. Demarest, Racine; Robert E. Corba, Caledonia; Allen D. Miller, Mt. Pleasant; John M. Fritz, Oak Creek, all of Wis., and Donald J. Shanklin, Fullerton, Calif., assignors to S. C. Johnson & Son, Inc., Racine, Wis.

Filed Jan. 28, 1994, Ser. No. 188,003

Int. Cl.^{6} B65B ***1/04;3/04***

U.S. Cl. 141—3 **23 Claims**

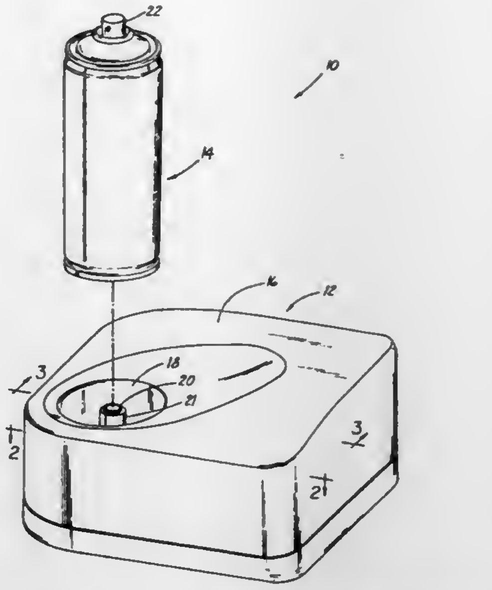
18. A method of pressurizing an aerosol dispensing container comprising:

taking a pressurizable aerosol dispensing container having a top dispensing end and a bottom base end, the bottom base end having a centrally located pressure activated container air inlet valve located therein, and

a portable electrically operated compressor unit having a housing with a container-accepting recess on one surface thereof and a telescoping air tube located therein being movable relative to the container-accepting recess, located within the housing is an electrically controlled compressor, switching means for activating and deactivating the compressor in circuit with the compressor and a source of electric power, and an air carrying means operably connected to, at one end, the compressor, and at the other end, the telescoping air tube, wherein the switching means comprises a single switching mechanism having a mechanically-activated compressor activation system and a pneumatic pressure activated compressor deactivation system,

pressing the dispensing container into the container-accepting recess, thereby activating the compressor by pressing the bottom base end against the telescoping air tube, allowing pressurized air to exit the compressor unit through the telescoping air tube and to enter the dispensing container through the container air inlet valve, and

removing the pressurized dispensing container from the compressor unit when the compressor has switched off.



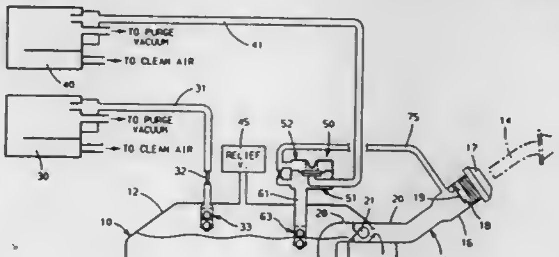
5,462,100
FUEL FILL VAPOR RECOVERY SYSTEM WITH DIFFERENTIAL PRESSURE CONTROL VALVE

Charles H. Covert, Manchester; Richard W. Wagner, Albion; Kenneth W. Turner, Webster, and Karen M. Meyer, Avon, all of N.Y., assignors to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 121,932, Sep. 15, 1993, abandoned. This application Aug. 31, 1994, Ser. No. 299,282

Int. Cl.^{6} F16K ***17/04***

U.S. Cl. 141—59 **6 Claims**



1. In a vehicle having a fuel tank that is filled through a fill pipe having a filler neck that is open to atmosphere when a gas cap is removed therefrom for refueling, a vapor recovery system for storing vapor displaced from the fuel tank by liquid fuel from a refueling nozzle inserted in the filler neck comprising, in combination:

vapor storage canister means;

a valve assembly having a housing defining first and second chambers separated by a diaphragm carrying a valve member, the housing further defining an internal conduit separate from the first and second chambers and having an end defining a valve seat adjacent the valve member, the valve member being movable with the diaphragm in response to varying differential pressure into and out of engagement with the valve seat to close and open the internal conduit to the first chamber, and spring means biasing the valve member toward engagement with the valve seat;

a vapor vent conduit communicating a vapor collection region of the fuel tank with the first chamber of the valve assembly;

a vapor recovery conduit communicating the internal conduit with the vapor storage canister means;

a vapor recirculation conduit communicating the second chamber of the valve assembly with the filler neck; and

means communicating the first and second chambers of the valve assembly through a restricted orifice to allow equalization of pressure across the diaphragm when the filler neck is closed from the atmosphere by the gas cap so as to allow the spring means to maintain the valve member in engagement with the valve seat to close the internal conduit from the first chamber, the vapor recirculation conduit providing communication of atmospheric pressure to the second chamber when the gas cap is removed from the filler neck with the restricted orifice in the means communicating the first and second chambers allowing the diaphragm to be activated by a differential pressure during refueling so as to move the valve member out of engagement with the valve seat and thus permit relatively unrestricted vapor flow from the fuel tank to the vapor storage canister means, with a portion of the vapor flow from the fuel tank flowing at a controlled rate through the restricted orifice and the recirculation conduit to the filler neck for recirculation by entrainment in incoming liquid fuel.

5,462,101

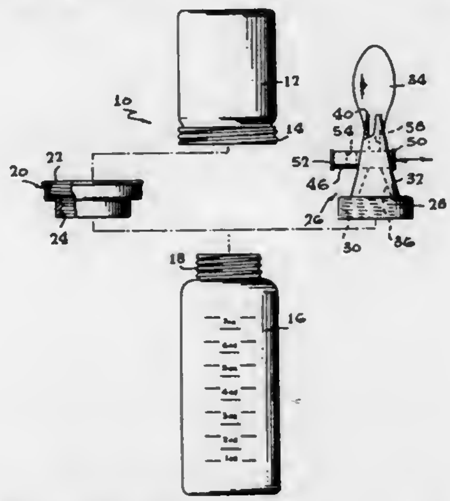
BABY FEEDING SYSTEM

Silva Mouchmouchian, 19401 Haynes St., #12, Reseda, Calif. 91335

Filed Jul. 5, 1994, Ser. No. 270,686

Int. Cl.^{6} B65B *1/04; 3/00*

U.S. Cl. 141—364 **15 Claims**



1. A baby feeding system comprising:

a coupler, said coupler being open therethrough, said coupler having first detachable attachment means for attachment to the neck of a jar of baby food and having second detachable attachment means for attachment to the neck of a squeezable baby bottle so that a jar of baby food and a squeezable baby bottle can both be detachably attached to said coupler with the jar of baby food inverted so that the food is gravitationally transferred into the squeezable baby bottle; and

a baby food dispenser, said baby food dispenser having attachment means thereon for detachable attachment to the neck of the squeezable baby bottle from which said coupler has been removed, said dispenser having a dispenser opening therethrough and having a spoon attached thereto so that the baby bottle can be squeezed and dispense food through said dispenser opening onto said spoon for feeding a baby, and a valve in said dispenser opening for selectively closing said dispenser opening.

5,462,102

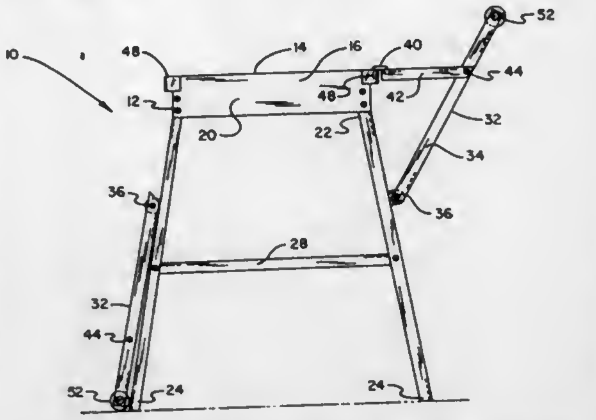
ADJUSTABLE ROLLING SAW STAND

William A. Searfoss, R.R. 7 Box 22, Bloomsburg, Pa. 17815

Filed Aug. 3, 1994, Ser. No. 285,109

Int. Cl.^{6} B25H *1/02*

U.S. Cl. 144—287 **1 Claim**



1. A new and improved adjustable rolling saw stand comprising, in combination:

a stand having a planar upper surface constituting a base for the removable receipt of a saw to be used for cutting material, the upper surface being formed in a rectangular configuration with a short downwardly extending peripheral skirt in a rectangular configuration, a plurality of legs secured at their upper ends to the surface and skirt and lower ends positionable on the ground, a plurality of cross rods secured in a rectangular configuration at intermediate points of the legs to couple the legs for additional support;

a support assembly located on opposite sides of the base, each support assembly having a pair of pivot arms pivotally secured at their inboard ends to an adjacent pair of legs at an intermediate extent thereof for movement between an elevated operative position and a lower depending position;

a locking assembly located on each side of the base, each locking assembly having a pair of locking arms for each support assembly with each pair of locking arms having exterior ends pivotally secured to an intermediate extent of the pivot arms with a support rod therebetween, the locking arms having interior ends with hooks with receiving slots secured to adjacent corners of the base for receiving the hooks when the pivot arms are in the elevated position and for removal thereof when the pivot arms are in the lower position;

a pair of rotatable rollers, each roller secured between the exterior ends of each pair of pivot arms whereby, when the pivot arms are in the elevated position, the rollers may be used for supporting material to be cut to assist a user in the handling thereof, and when the pivot arms are in the lower position, the rollers are adapted to rest on a floor beneath the lower ends of the legs to assist in the rolling of the device from one position to another; and

a bearing assembly at the end of each roller to facilitate the rolling movement of the roller with respect to the support arms.

5,462,103

COVER FOR A TRAY JACK

Gerald I. Effa, One E. Camelback Rd., Ste 550, Phoenix, Ariz. 85012

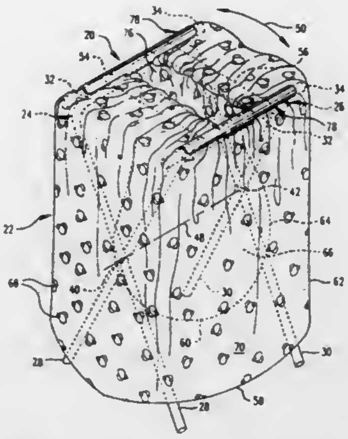
Filed May 21, 1993, Ser. No. 65,815

Int. Cl.^{6} B65D *65/04*

U.S. Cl. 150—154 **11 Claims**

1. The combination of a folding tray jack and a removable cover for said jack:

said tray jack having: two components, each with a horizontally extending, tray supporting means at an upper end thereof and



spaced apart legs which depend from the tray supporting means; means so connecting said components for relative pivotal movement about a transverse axis paralleling the axes of elongation of said tray supporting means that said components can be swung toward each other to collapse the jack to a compact, easily handled configuration and away from each other to provide a second configuration in which said tray supporting means are in a spaced apart, tray supporting role; and means extending from one to the other of the tray jack components for limiting the movement away from each other of the horizontally extending, tray supporting means;

said cover having: a skirt configured to completely surround and conceal said jack and to extend from the upper ends of said components downwardly thereover; and

said cover also having an integral segment folded over the upper end of the tray jack, said integral segment depending through an opening located at the upper end of the tray jack and defined by said tray supporting means and said flexible straps, and said integral segment of said cover forming a receptacle with a closed lower end and an open upper end.

5,462,104
TOROIDAL CARCASS FOR ROAD VEHICLE TIRES

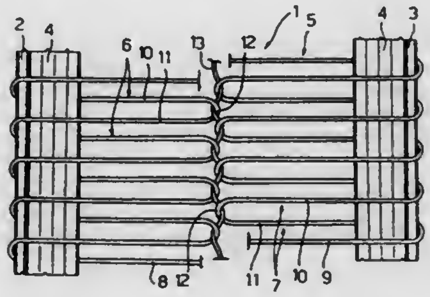
Karl J. Siegenthaler, Rome, Italy, assignor to Bridgestone Corporation, Tokyo, Japan

Filed Oct. 14, 1994, Ser. No. 323,212

Claims priority, application Italy, Dec. 14, 1993, TO93A0945

Int. Cl.^{6} B60C *9/02;9/10*

U.S. Cl. 152—563 **4 Claims**



1. A toroidal carcass (1) for road vehicle tires, comprising:

the carcass, having two annular beads;

a toroidal reticulated structure connecting the beads which structure includes a number of elongated reinforcing elements extending in substantially radial planes in relation to the beads; said elongated elements defined by a pair of loops, each loop extending in respective radial planes in relation to and from the beads, and forming part of respective turns of respective first and second continuous cords wound about the beads; and

a third continuous cord connecting the loops in said pair of loops.

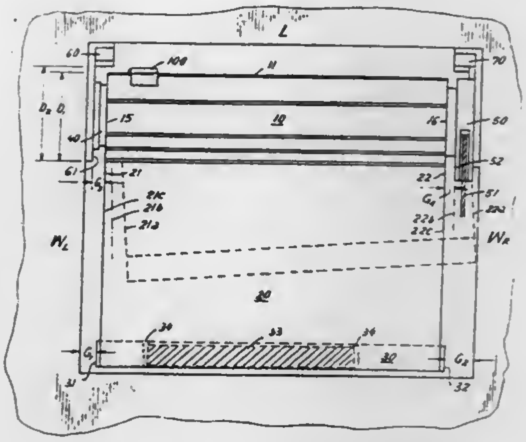
5,462,105
ADJUSTMENTS FOR WINDOW SHADES

Janusz Supernak, 4905 Caminito Exquisito, San Diego, Calif. 92130

Filed Aug. 7, 1992, Ser. No. 925,871

Int. Cl.^{6} E06B *9/08*

U.S. Cl. 160—323.1 **37 Claims**



1. Means for the angular adjustment of a rectangular window shade within a window opening, said window shade at least partially rolled upon a window shade roller, said window shade roller having a first end and a second end and an effective diameter, said means comprising;

at least one device installed at a location upon said window shade roller, whereby

said device provides an increase in said effective diameter of said window shade roller at and around said location where said device is installed and said increase in said effective diameter of said window shade roller at said location skews said window shade toward said location of said window shade roller having said increase in said effective diameter.

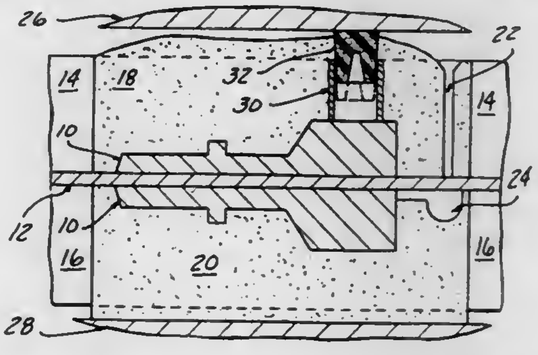
5,462,106
METHOD OF PRODUCING A MOLD OPEN RISER IN MOLD DURING CASTING

Paul E. Hanna, 4 Brandywine Cir., Greensboro, N.C. 27409

Filed May 31, 1994, Ser. No. 251,128

Int. Cl.^{6} B22C *9/08*

U.S. Cl. 164—15 **4 Claims**



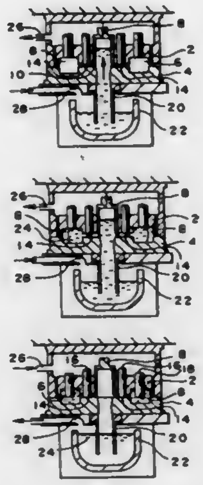
1. A method of forming an open riser in a mold, comprising the steps of installing a riser sleeve within the cope sand extending against a mold pattern;

telescoping a heat consumable plug into an upper end of said riser sleeve so as to be partially press fitted therein with a portion thereof projecting above said upper end of said riser sleeve and the level of said cope sand; and

pushing said plug further into said riser sleeve as said cope sand is squeezed in constructing said mold, whereby up consuming of said plug by hot metal during casting, an open riser is produced.

5,462,107
VACUUM CASTING METHOD

Tamotsu Hasegawa; Yasuyuki Arakawa, both of Nagoya, and Atushi Ota, Toyota, all of, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan
Filed Jun. 28, 1994, Ser. No. 266,549
Claims priority, application Japan, Jun. 30, 1993, 5-160789
Int. Cl.⁶ B22D *18/04;18/06*
U.S. Cl. 164—63 **7 Claims**



1. A vacuum casting method comprising the steps of:

isolating a molding cavity defined by a die from a molten metal retaining dome;

reducing pressure in said molding cavity defined by said die;

moving molten metal through said molten metal retaining dome at a final rising speed of between about 5 and 10 cm/sec;

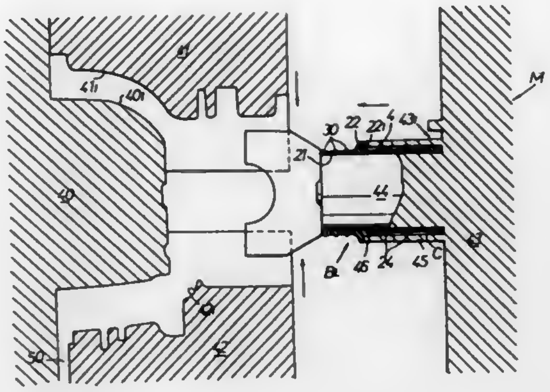
opening a passage between said molding cavity defined by said die and said molten metal retaining dome to charge said molten metal moved through said molten metal retaining dome into said molding cavity defined by said die;

pressurizing said molten metal in said molding cavity defined by said die; and

allowing said molten metal in said molding cavity defined by said die to solidify.

5,462,108
PROCESS FOR CASTING A CYLINDER BLOCK

Hisashi Katoh, Saitama; Tadayoshi Nakajima, Mie; Tsunehisa Hata; Hideyo Miyano, both of Saitama, and Shinsuke Koda, Tochigi, all of, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Division of Ser. No. 456, Jan. 4, 1993, Pat. No. 5,357,921. This application Aug. 31, 1994, Ser. No. 298,754
Claims priority, application Japan, Jan. 6, 1992, 4-310; Jan. 6, 1992, 4-311; Jan. 9, 1992, 4-2474
Int. Cl.⁶ B22D *19/08*
U.S. Cl. 164—98 **2 Claims**



1. A process for casting a cylinder block comprising a cylinder liner block mounted in a cylinder block body to define a cylinder bore and a water jacket defined around an outer periphery of said cylinder liner block and opened into a deck surface of said cylinder block body, said process comprising steps of:

providing an integrally projecting seal flange around an outer periphery of a lower portion of a hollow cylindrical cylinder liner block;

setting said hollow cylindrical cylinder liner block into a metal mold for forming the cylinder block body;

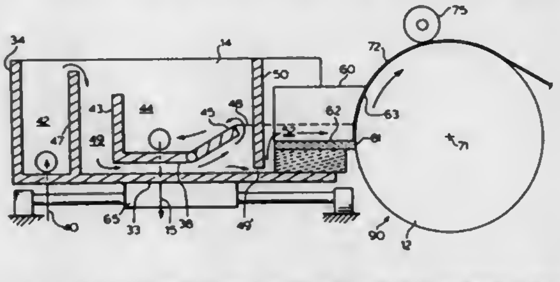
fitting an outer peripheral surface of said cylinder liner block into a hollow cylindrical jacket projection formed in said metal mold so as to mate a free end of said jacket pin to a sealing surface of the seal flange; and

pouring a molten metal under a pressure into a cavity defined by said metal mold and said cylinder liner block, thereby anchoring the cylinder liner block into the cylinder block body in a cast-in manner so as to form the cylinder liner block.

5,462,109
METHOD AND APPARATUS FOR PRODUCING METAL STRIP

Albert M. Vincze; Theodore J. Seymour, both of Oakville; Patrick Culkeen, Burlington; Nai-Yong Tang; Gerald P. Lewis, both of Mississauga; Paul Niessen, Waterloo, and John V. Marlow, Oakville, all of, Canada, assignors to Cominco Ltd., Vancouver, Canada
Filed Oct. 5, 1992, Ser. No. 956,212
Int. Cl.⁶ B22D *11/06;11/10;11/12*
U.S. Cl. 164—479 **30 Claims**

1. A method for the casting of metal strip on a moving, chilled casting surface on substantially the upper half of a rotatable casting drum from a pool of molten metal comprising:



providing a tundish containing a pool of molten metal adjacent a substantially vertical portion of said casting surface, said tundish having a feed chamber, a return chamber and a diverting chamber and having an open front in proximity to the casting surface, removably attaching in said tundish adjacent said open front a graphite lip insert having a floor and opposed sidewalls adapted for a fit with the tundish open front whereby said molten metal cannot leak thereby, said graphite lip insert having an open front defined by the lip insert floor and the lip insert sidewalls cooperating with the substantially vertical portion of the casting surface adjacent thereto to contain the pool of said molten metal in the lip insert;

controlling the surface level of the pool of molten metal;

moving said casting surface upwardly through said pool of the molten metal by rotating said drum for depositing a layer of the molten metal thereon;

cooling said molten metal to solidify a strip of the metal on the casting surface; and

stripping the metal strip from the casting surface.

21. An apparatus for direct casting of strip from a pool of molten metal in a tundish onto a chilled casting surface adjacent thereto on substantially the upper half of a rotatable casting drum comprising a tundish including a feed chamber, a return chamber and a diverting chamber having passageways communication said chambers in sequence, said tundish having an open front in proximity to a substantially vertical portion of the casting surface, a lip insert having a floor and opposed sidewalls adapted to be inserted into the tundish adjacent the tundish open front, said lip insert having an open front defined by the lip insert floor and sidewalls for cooperation with the casting surface to contain a pool of said molten metal having a surface level within the lip insert, said pool being in pressure communication with the diverting chamber whereby the surface level of the pool in the lip insert is the same as a surface level of molten metal in the diverting chamber, means for controlling the surface level of the pool of said molten metal in the diverting chamber to control the surface level in the lip insert, and means for moving the chilled casting surface upwardly through the pool of molten metal for the casting of metal on the chilled casting surface.

5,462,110

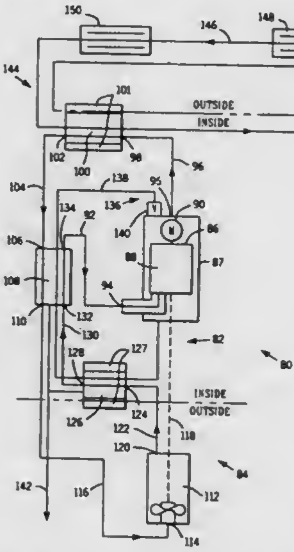
CLOSED LOOP AIR-CYCLE HEATING AND COOLING SYSTEM

Donald L. Sarver, P.O. Box 323, Cudahy, Wis. 53110

Filed Dec. 30, 1993, Ser. No. 175,609

Int. Cl.^{6} F25B *29/00;* **F25D** *9/00*

U.S. Cl. 165—48.1 **6 Claims**



1. A closed air cycle system for heating and cooling air within the interior of a structure having a liquid radiator system, comprising:

a compressor to compress air;

a first heat exchanger coupled to the compressor so as to intake compressed air therefrom;

a first louver interconnected to the first heat exchanger, the first louver movable between a first heating position wherein the first heat exchanger effects a heat exchange between the compressed air and the liquid radiator system within the interior of the structure and a second cooling position wherein the first heat exchanger effects a heat exchange between the compressed air and outside air;

a second heat exchanger coupled to the first heat exchanger so as to intake the compressed air and coupled to the compressor so as to provide air to the compressor, the second heat exchanger effecting a heat exchange between the compressed air and the air provided to the compressor;

a turbine coupled to the first heat exchanger to intake the compressed air, the turbine rotating by energy of the compressed air so as to generate energy to partially power the compressor and to decompress the compressed air; and

a third heat exchanger coupled to the turbine so as to intake the decompressed air and coupled to the first heat exchanger so as to provide the air for the compressor;

a second louver interconnected to the third heat exchanger, the second louver movable between a first heating position wherein the third heat exchanger effects a heat exchange between the decompressed air and outside air and a second cooling position wherein the third heat exchanger effects a heat exchange between the compressed air and the interior of the structure.

5,462,111

COOLING APPARATUS

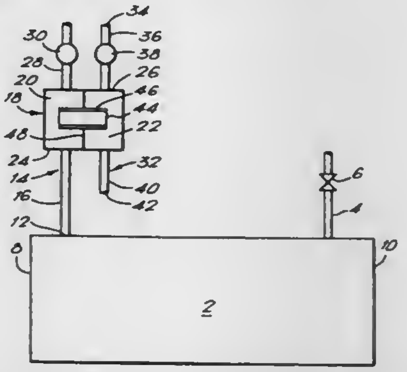
David G. Wardle, Tadworth, England, assignor to The BOC Group plc, Windlesham, England

Filed Mar. 25, 1994, Ser. No. 218,381

Claims priority, application United Kingdom, Mar. 29, 1993, 9306496

Int. Cl.^{6} F28D *15/00*

U.S. Cl. 165—104.14 **15 Claims**



1. Cooling apparatus comprising, a single cooling chamber; means for injecting a gas or cold vapor thereof into the chamber; an exhaust gas passage for removing exhaust gas from the cooling chamber, said exhaust gas comprising vapor of the liquified gas; flow inducing means in said exhaust gas passage operable to draw said exhaust gas therethrough; and at least one heat pipe having one end in heat transfer relationship with a region of said exhaust passage and an other end in heat transfer relationship with a heat source, whereby, in operation, the heat pipe transfers heat from said heat source to the exhaust gas.

5,462,112

PLATE HEAT EXCHANGER

Clas-Göran Johansson, Löddeköpinge, Sweden, assignor to Alfa-Laval Food Engineering AB, Lund, Sweden

Filed Mar. 28, 1994, Ser. No. 211,284

Claims priority, application Sweden, Jan. 25, 1991, 9103122

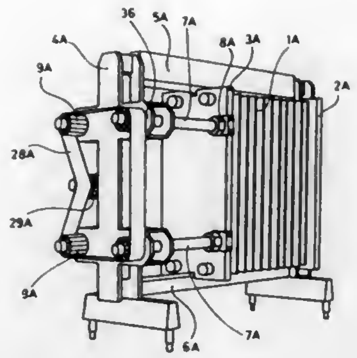
Int. Cl.^{6} F28F *3/08*

U.S. Cl. 165—167 **11 Claims**

1. A plate heat exchanger comprising a package of heat transferring plates (1),

two end plates (2, 3) between which the package of heat transferring plates (1) is kept together,

at least two threaded bolts (7), said bolts extending between the end plates (2, 3) and having bolt heads (27) arranged to bear directly or indirectly against one (2) of the end plates,



a plurality of nuts (**9**), each in threaded engagement with one of said bolts (**7**) and arranged to bear directly or indirectly against the other end plate (**3**),

the bolts (**7**) and nuts (**9**) being arranged for movement of one of said two end plates toward or away from the other,

said heat exchanger further comprising

a flexible endless drive member (**28**) partly surrounding and engaging by rotational driving engagement each of said bolts (**7**) or each of said nuts (**9**), and

a motor (**29**) in driving engagement with the drive member (**28**) for simultaneous rotation of all the bolts (**7**) or nuts (**9**),

said bolt heads (**27**) and said nuts (**9**) being coupled to their respective end plates (**2**, **3**) in a manner such that they are prevented from moving axially away from their respective end plates (**2**, **3**) upon operation of the drive member (**28**).

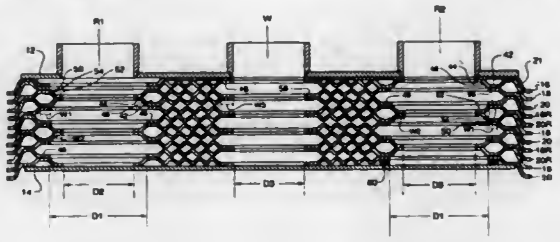
5,462,113

THREE-CIRCUIT STACKED PLATE HEAT EXCHANGER

Steven M. Wand, York City, Pa., assignor to FlatPlate, Inc., York, Pa.

Filed Jun. 20, 1994, Ser. No. 262,682
Int. Cl.^{6} F28F *3/08*

U.S. Cl. 165—167 **6 Claims**



1. A three-circuit stacked plate heat exchanger comprising a stack of at least six generally rectangular sheet metal plates of uniform outside dimensions arranged in a stacked relationship with the peripheries of adjacent plates connected in a fluid-tight manner, the stack having a top and a bottom, characterized in that:

a) the stack consists of first plates of a first configuration alternating with second plates of a second configuration, beginning with top first and second plates at the top of the stack;

b) the top first and second plates are both in a first position, the first and second plates immediately below the top first and second plates are both in a second position reached by rotation of 180° from the first position, and thereafter in the stack each first and second plate is rotated by 180° relative to the nearest first or second plate respectively above or below it;

c) each plate has lateral and longitudinal axes;

d) each plate includes a heat exchange portion in which the plate surface lies between spaced parallel upper and lower planes;

e) each plate has first through sixth generally circular ports cut through it for allowing fluid passage, said ports being so located on each plate that when adjacent first and second plates are both in said first or second position the first through sixth ports in the first plate are aligned with the corresponding first through sixth ports respectively in the second plate, and when a first plate in one of said first and second positions is adjacent to a second plate in the other of said first and second positions the first, second, third, fourth, fifth and sixth ports in the first plate are aligned respectively with the fourth, third, second, first, sixth and fifth ports in the second plate;

f) the surface of each first plate is configured such that:

- i) each of said first and third ports has a first diameter and the plate surface around the edge of each said port defines an annular planar platform of a first width and distance from the port center lying in the lower of said parallel planes;
- ii) each of said second and fourth ports has a second diameter and the plate surface around each said port defines first and second annular planar platforms, the first platform being of said first width and distance from the port center and lying in the lower of said parallel planes, the second platform being of a second width and distance from the port center and lying in the upper of said parallel planes, the inner edge of one of said first and second platforms being the edge of said port, the inner edge of the other of said first and second platforms being radially outward from the outer edge of said one platform, said plate surface further defining a section connecting the outer edge of said one of said platforms with the inner edge of said other of said platforms; and
- iii) each of said fifth and sixth ports has a third diameter and the plate surface around the edge of each said port defines an annular planar platform of a third width lying in the upper of said parallel planes;

g) the surface of each second plate is configured such that:

- i) each of said first and third ports has said abovementioned second diameter and the plate surface around each said port defines first and second annular planar platforms, the first platform being of said above-mentioned first width and distance from the port center and lying in the upper of said parallel planes, the second platform being of said above-mentioned second width and distance from the port center and lying in the lower of said parallel planes, the inner edge of one of said first and second platforms being the edge of said port, the inner edge of the other of said first and second platforms being radially outward from the outer edge of said one platform, said plate surface further defining a section connecting the outer edge of said one of said platforms to the inner edge of said other of said platforms;
- ii) each of said second and fourth ports has said abovementioned first diameter and the plate surface around the edge of each said port defines an annular planar platform of said above-mentioned first width and distance from the port center lying in the upper of said parallel planes; and
- iii) each of said fifth and sixth ports has said abovementioned third diameter and the plate surface around the edge of each said port defines an annular planar platform of said above-mentioned third width lying in the lower of said parallel planes; and

h) abutting surfaces in adjacent plates are joined in a fluid-tight manner.

5,462,114

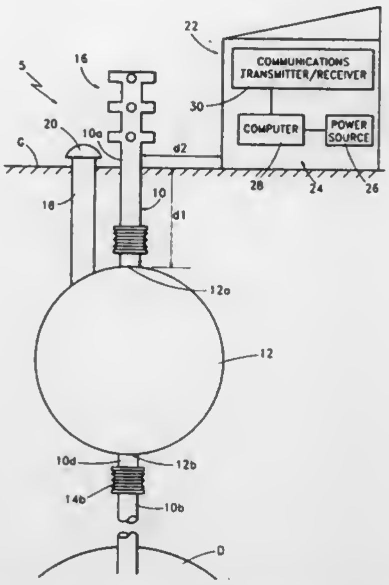
SHUT-OFF CONTROL SYSTEM FOR OIL/GAS WELLS

Anthony T. Catanese, Jr., 724 First St., Mamaroneck, N.Y. 10543

Filed Nov. 19, 1993, Ser. No. 154,594
Int. Cl.^{6} E21B *34/06;34/16*

U.S. Cl. 166—53 **38 Claims**

1. Shut-off control system for an oil/gas well casing an upper portion of which extends above ground level and is connected to a discharge manifold and a lower portion of which extends below ground level to an oil/gas dome from which oil or gas is extracted, said control system comprising a protective enclosure positioned a predetermined distance below ground level and being substantially fully enclosed but having input and output openings through which



said well casing enters and exits said enclosure; and having entry means for providing entry to said enclosure to authorized personnel means within said enclosure for permitting flow of oil or gas through said well casing when in an open condition and for inhibiting flow through said casing when in a closed condition; actuator means mechanically coupled to said valve means for actuating said valve means for actuating said valve means to said open or closed conditions; and normally inaccessible closure means at least partially disposed below ground level and connected to said actuator means for selectively controlling the condition of said actuator means, whereby undesired flow of oil/gas can be terminated in the event of an abnormal alarm condition at the discharge manifold with said entry means being coupled to said actuator means for closing said valve means upon unauthorized opening of said entry means.

5,462,115

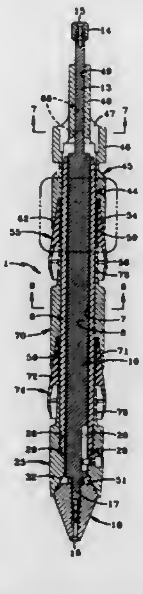
GAS AND OIL WELL SWAB

Steven V. Belden, Massillon; Dennis D. Belden, Jr., Akron, and John G. Corp, Norton, all of Ohio, assignors to Belden & Blake Corporation, North Canton, Ohio

Filed Mar. 3, 1994, Ser. No. 205,069

Int. Cl.^{6} E21B *43/25*; F04B *47/12*

U.S. Cl. 166—177.3 **17 Claims**



1. A swab for mounting within a well casing including:

a) an elongated hollow body having a generally inner surface defining an axial bore extending through said body and providing an internal fluid flow passage;

b) openings formed in upper and lower portions of the body and communicating with the internal flow passage;

c) seal means mounted on the body to provide a seal between an outer surface of the swab and an interior wall of a well casing;

d) an actuating rod slidably mounted within the bore of the swab body;

e) valve means connected to the actuating rod for opening and closing the opening formed in the lower portion of the body for regulating the flow of fluid through the bore from a well casing during the descent and ascent of the swab in said casing; and

f) pressure relief means mounted in the swab body between the seal means and the valve means providing a relief passage extending between an interior of a well casing and the fluid flow passage within the body for automatically opening upon the fluid pressure within a well casing reaching a predetermined amount.

5,462,116

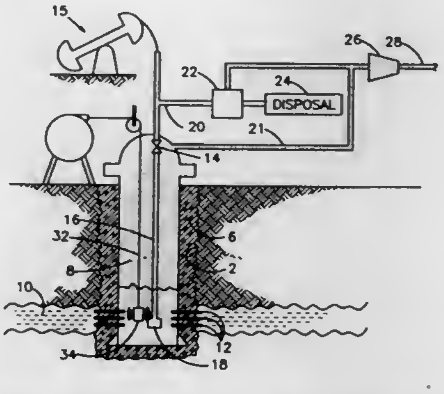
METHOD OF PRODUCING METHANE GAS FROM A COAL SEAM

Walter D. Carroll, 12111 Burgoyne Dr., Houston, Tex. 77077

Filed Oct. 26, 1994, Ser. No. 329,458

Int. Cl.^{6} E21B *43/00*

U.S. Cl. 166—249 **14 Claims**



1. A method of producing coal-bed methane gas from a wellbore comprising the steps of:

drilling a wellbore so that a coal seam is intersected;

casing said wellbore with cement, said casing having a first end and a second end;

providing a valve control means, attached at the first end of said casing, for controlling the methane gas from the wellbore;

perforating said casing at a depth that intersects said coal seam;

fracturing the coal seam;

providing a valve control means at the first end of said casing;

lowering a transducer into the wellbore of said casing to a depth corresponding to the depth of said perforations, said transducer capable of converting electrical energy to a sound energy;

activating said transducer so that the sound energy is produced;

producing the methane gas.

5,462,117

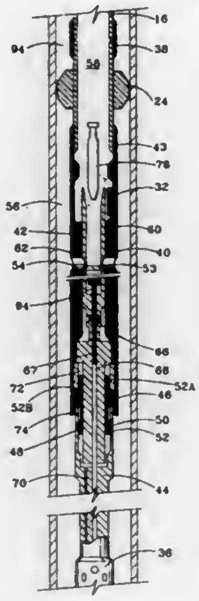
TUBING CONVEYED PERFORATING SYSTEM WITH FLUID LOSS CONTROL

Robert R. Green, Houston, and Kelly D. Ireland, The Woodlands, both of Tex., assignors to Baker Hughes Incorporated, Houston, Tex.

Filed Oct. 25, 1994, Ser. No. 328,721

Int. Cl.^{6} E21B *43/116;34/06*

U.S. Cl. 166—297 **20 Claims**



1. A downhole assembly for suspending in a wellbore from a tubular string having a tubing flow path therein, the assembly positioned above a perforating gun suspended from a tubular string, and a packer being positioned on the tubular string above the perforating gun for sealing an annulus about the tubular string, the assembly further comprising:

a housing having a flow port therein for normally maintaining fluid communication between the tubing flow path and a lower portion of the annulus below the packer;

a flapper valve mounted on the housing, the flapper valve being biased closed for sealing the tubing flow path above the flapper valve from the tubing flow path below the flapper valve;

a lock assembly for normally suspending the perforating gun from the housing and for releasing the perforating gun upon activation of the perforating gun; and

a stop member structurally interconnected to the perforating gun and normally positioned in a stop position for preventing closure of the flapper valve, such that upon firing of the perforating gun the lock assembly releases the perforating gun and the stop member is moved to a release position to close the flapper valve.

14. A method of perforating and producing a well, comprising:

suspending a perforating gun in a wellbore from a tubular string;

setting a packer positioned on the tubular string for sealing an annulus about the tubular string;

firing the perforating gun;

releasing the fired perforating gun from the tubular string; and

automatically closing the valve for sealing a tubular flowpath within the tubular string in response to releasing the fired perforating gun.

5,462,118

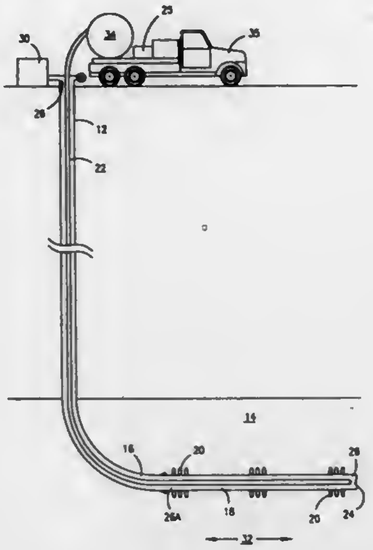
METHOD FOR ENHANCED CLEANUP OF HORIZONTAL WELLS

Alfred R. Jennings, Jr., Plano, and Michael R. Chambers, Bedford, both of Tex., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed Nov. 18, 1994, Ser. No. 342,318

Int. Cl.^{6} E21B *37/00*

U.S. Cl. 166—312 **10 Claims**



1. A method for improving the efficiency of horizontal wellbore cleanout in a horizontal wellbore drilled from a vertical wellbore comprising the steps of:

running a coiled tubing into said horizontal wellbore;

injecting a first cleanup fluid down said coiled tubing;

injecting a second cleanup fluid down an annulus formed by said coiled tubing and said wellbore;

balancing injection rates in said coiled tubing and said annulus; and

reciprocating said coiled tubing back and forth over said horizontal wellbore.

5,462,119

TUBING HANGING SET FOR A SUBMARINE OIL-WELL, RUNNING TOOL FOR ITS PLACING AND HANDLING METHOD

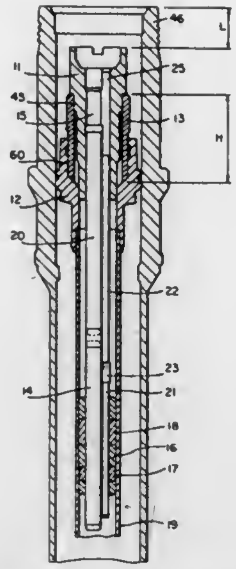
Walber P. de Souza, São Goncalo, and José R. F. Moreira, Rio de Janeiro, both of, Brazil, assignors to Petroleo Brasileiro S.A.-Petrobras, Rio de Janeiro, Brazil

Filed May 13, 1994, Ser. No. 242,625

Int. Cl.^{6} E21B *33/043;33/047*

U.S. Cl. 166—348 **3 Claims**

1. A tubing hanging set for hanging, locking and sealing a submarine oil-well comprising a tubing hanger (**11**), a connection sleeve (**13**), a double hydraulic packer (**16**) and tubular extensions, (**20**) and (**22**), wherein the tubing hanger (**11**) is seated on an upper internal part (**45**) of said connection sleeve (**13**), said connection sleeve (**13**) having a lower external part seated on an internal upper part (**24**) of a casing hanger (**12**); said tubing hanger (**11**) having passageways (**15**) and (**25**) extending therethrough; one of said passageways (**15**) being connected with one of the tubular extensions which in turn is connected to tubing (**14**) extending through said double hydraulic packer (**16**) and the other of said passageways (**25**) having internally a valve to block the flow from the annulus between tubing (**14**) and casing (**19**) located in the portion below the double hydraulic packer (**16**); the connection from the other of said passageways (**25**) and said annulus being made by the other of said tubular extensions (**22**) connected by means of a sleeve (**23**) to a short tubing (**21**) extending through the double hydraulic packer (**16**); said double hydraulic packer (**16**) having



grips (17) for locking tubing hanging set (10) and at least one packing unit (18) for sealing said tubing hanging set (10) in a casing depending from said casing hanger.

5,462,120

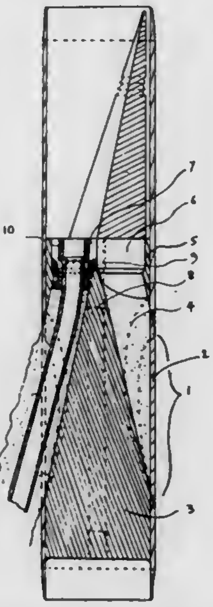
DOWNHOLE EQUIPMENT, TOOLS AND ASSEMBLY PROCEDURES FOR THE DRILLING, TIE-IN AND COMPLETION OF VERTICAL CASED OIL WELLS CONNECTED TO LINER-EQUIPPED MULTIPLE DRAINHOLES

Michel Gondouin, San Rafael, Calif., assignor to S-Cal Research Corp., San Rafael, Calif.

Filed Jan. 4, 1993, Ser. No. 814,585

Int. Cl.^{6} E21B *7/04; 43/00*

U.S. Cl. 166—380 7 Claims



1. Apparatus for completing a multi-branch cased well for oil recovery by sequential cyclic steam injection methods and for petroleum production from non-uniformly-pressured heterogeneous reservoirs through medium curvature, liner-equipped, horizontal drainholes;

said apparatus includes downhole equipment, tools and devices for making casing/liner and liner tubing sealed connections and individual liner/drainhole flow connections, comprising:

a) a special steel casing joint equipped with a hard metal multi-channel whipstock permanently affixed to and sealed in said casing joint by means of an upper guide plate presenting at least two small feed-through vertical holes, one of which terminated at both ends by threaded connections, and two larger vertical holes, each leading to a slanted cylindrical curved channel partly filled with a cement plug and each said channel leading to an elliptical window machined in a direction slanted downwards at a pre-selected kick-off angle into the wall of said casing joint and plugged by a drillable plate conforming with the outer surface of said casing joint,

b) a retrievable wedge-type top whipstock tool whose base presents at least two alignment pins or prongs fitting into said guide plate small holes, in which they are held by releasable latches, said top whipstock's outer lateral surface presenting at least one latching recess for its removal using an overshot tool,

c) an overshot tool equipped with releasable hooks to pull out, re-orient and reset said top whipstock, in the same trip,

d) a steel liner inserted in a drainhole drilled through each said whipstock channel, said liner hung with devices resisting liner weight and thermal expansion forces applied to said liner from above as well as from below and said liner permanently sealed into said channel by a pressure-sealing device including a heat-resistant seal, in addition to thermal cement,

e) a tubing completion assembly conveying production fluids from a drainhole to the surface and steam from the surface to a drainhole; wherein said tubing completion assembly is terminated, at its lower end, by a heat-resistant, pressure-tight, multiple-breakable-sealed connecting device wherein two pairs of vertical tubular connector prongs, equipped with releasable high-temperature-sealing devices, respectively fit into the two larger holes and into the two smaller holes in the guide plate of said special casing joint, to respectively convey production fluids from a drainhole to said tubing assembly and steam from a known three-way valve to the other drainhole,

f) a hydraulically-operated slot-cutting tool for selectively perforating said drainhole liner to establish a flow connection between a surrounding oil reservoir and said liner in its uncemented lower part.

5,462,121

FAILSAFE LINER INSTALLATION ASSEMBLY AND METHOD

Phillip W. Schmuck, New Waverly; Steven R. Hayter, Houston; James R. Zachman, The Woodlands, and John V. Salerni, Kingwood, all of Tex., assignors to Baker Hughes Incorporated, Houston, Tex.

Filed May 3, 1994, Ser. No. 238,064

The portion of the term of this patent subsequent to Nov. 1, 2011, has been disclaimed.

Int. Cl.^{6} E21B *43/04*

U.S. Cl. 166—383 32 Claims

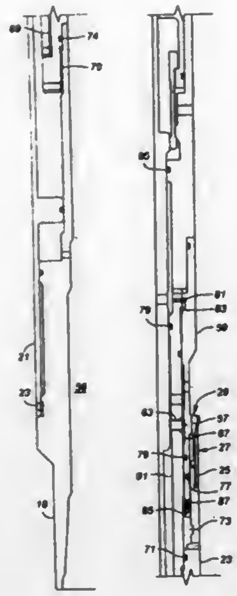
1. A downhole apparatus for positioning a tool, comprising:

positioning means for positioning the tool at a desired point downhole;

actuating means on said positioning means for selectively actuating the tool;

lock means operable on the tool for selective prevention of release of the tool from said positioning means responsive to rotational and longitudinal movements of said positioning means; and

said actuating means, when actuated to operate the tool facilitating unlocking of said lock means, at least in part, to allow release between the tool and said positioning means from at least one of rotational or longitudinal movement of said positioning means.

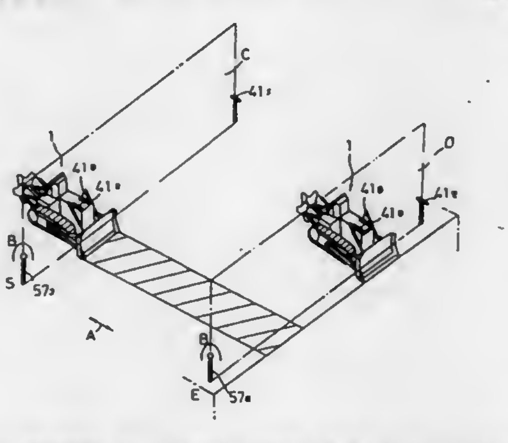


5,462,122
AUTOMATIC DRIVE CONTROL SYSTEM FOR A BULLDOZER

Shigeru Yamamoto; Shigenori Matsushita; Shu H. Zhang; Satoru Nishita, and Kazushi Nakata, all of Hirakata, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Jun. 24, 1994, Ser. No. 265,720
Claims priority, application Japan, Jul. 8, 1993, 5-169023
Int. Cl.⁶ E02F *3/76;3/00*

U.S. Cl. 172—2 **21 Claims**



1. An automatic drive control system for a bulldozer which is capable of automatically driving a bulldozer such that the bulldozer moves back and forth predetermined times between a digging start position and a digging end position, the automatic drive control system comprising:

(a) digging start detecting means for detecting that the bulldozer is in the digging start position;

(b) digging end detecting means for detecting that the bulldozer is in the digging end position;

(c) driving direction detecting means for detecting the momentarily varying driving direction of the bulldozer; and

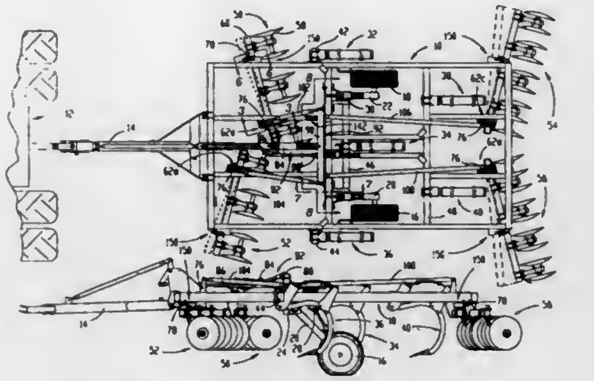
(d) drive controlling means for shifting a transmission into a forward gear when the digging start detecting means detects that the bulldozer is presently in the digging start position; shifting the transmission into a reverse gear when the digging end detecting means detects that the bulldozer is presently in the digging end position; and controlling the bulldozer such that the driving direction detected by the driving direction detecting means is made coincident with a target driving direction when the bulldozer is moving from the digging start position towards the digging end position.

5,462,123
TILLAGE IMPLEMENT WITH ON-THE-GO DEPTH CONTROL OF ANGLE ADJUSTABLE DISC GANGS

Robert D. Harlan, Hanover, and Donald R. Landoll, Marysville, both of Kans., assignors to Landoll Corporation, Marysville, Kans.

Filed Feb. 3, 1993, Ser. No. 13,000
Int. Cl.⁶ A01B *63/32*

U.S. Cl. 172—454 **23 Claims**



1. In a tillage implement having a wheeled frame, front and rear pairs of disc gangs mounted on the frame for working the soil as the implement is pulled across a field by a towing vehicle, and depth adjustment means for adjustably raising and lowering the gangs relative to the frame, the improvement comprising:

said front and rear pairs of gangs each including a left gang and a right gang,

said depth adjustment means including power mechanism operable from said towing vehicle for causing all of said gangs to be adjustably raised and lowered in unison during said depth adjustment,

said power mechanism including means permitting each of said gangs to be individually depth-calibrated independently of the others,

said mechanism including a hydraulic actuator, a common motion transmitting device coupled with the actuator for back and forth movement along a prescribed path of travel during extension and retraction of the actuator, and four operating links for the four gangs, there being one operating link for each of said gangs respectively,

said four links operably coupling the gangs with said device such that the gangs are depth-adjusted in unison by the device when the actuator is extended or retracted,

each of said links including means for selectively adjusting the length of each link without causing concurrent length adjustment of the other links, whereby to permit independent depth calibration of the gangs relative to one another,

said motion transmitting device being located intermediate the front and rear gangs,

the pair of links for the left and right front gangs extending rearwardly from the front gangs into operable connection with the motion transmitting device, and the pair of links for the left and right rear gangs extending forwardly from the rear gangs into operable connection with the motion transmitting device.

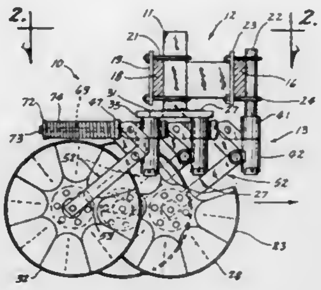
5,462,124
DUAL COULTER DEVICE

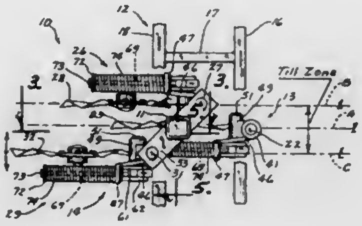
Ray Rawson, Farwell, Mich., assignor to Unverferth Manufacturing Co., Inc., Kalida, Ohio

Filed Sep. 1, 1993, Ser. No. 114,758

Int. Cl.^{6} A01B *35/16;35/28*

U.S. Cl. 172—569 5 Claims





1. A coulter assembly for mounting on a tool bar comprising in combination:

a forward coulter unit including a pivotal coulter wheel engageable with the ground for clearing residue and loosening the soil in a first path, and having an upstanding shank adapted for mounting on the tool bar;

a first coulter unit including a pivotal coulter wheel engageable with the ground for clearing residue and loosening the soil in a second path offset to one side from said first path, and having an upstanding first shank;

a second coulter unit including a pivotal coulter wheel engageable with the ground for clearing residue and loosening the soil in a third path offset to an opposite side of said first path from said second path, and having an upstanding second shank;

plate means secured to both said first shank and said second shank; and

a single upright post secured to said plate means and adapted for mounting on the tool bar.

5. A coulter assembly for mounting on a tool bar comprising in combination:

a first coulter unit including a pivotal wheel engageable with the ground for clearing residue and loosening soil in one path, and having an upstanding first shank;

a second coulter unit including a pivotal coulter wheel engageable with the ground for clearing residue and loosening the soil in another path offset to one side of said one path, and having an upstanding second shank;

plate means secured to both said first shank and said second shank;

a single upright post secured to said plate means and adapted for mounting on the tool bar;

and further wherein said first shank and said second shank are disposed completely below the tool bar;

and further wherein said plate means comprises an elongated relatively flat plate having a pair of apertures formed therein in spaced relationship for receiving, respectively, each said first shank and said second shank;

and further wherein said apertures are both laterally offset and staggered fore and aft from each other relative to the normal direction of movement of the coulter assembly.

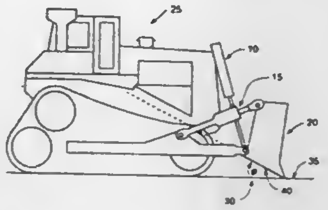
5,462,125
AUTOMATIC TIP ANGLE CONTROL

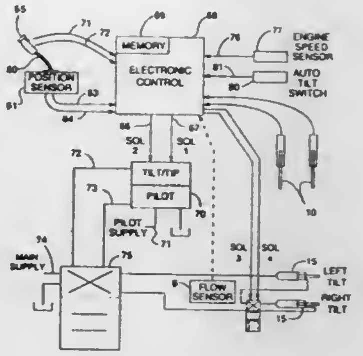
Ken L. Stratton, Dunlap; Kevin J. Lueschow, Edwards; James C. Barton, Peoria, and Thomas G. Hayes, Ipava, all of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Sep. 22, 1993, Ser. No. 125,439

Int. Cl.^{6} E02F *3/76;* G06F *15/50*

U.S. Cl. 172—826 18 Claims





1. On an off-highway vehicle having a tilt function associated with an implement, an automatic tilt system comprising:

a tilt actuator;

position sensing means for sensing the position of the tilt actuator and for outputting a position signal corresponding to the sensed position, wherein said position sensing means includes an engine speed sensor;

processor means for receiving the position signal, calculating an implement tilt angle position, calculating a command signal corresponding to the difference between the implement tilt angle and a desired implement angle position, and for outputting the command signal to the tilt actuator; and

selector means for selecting one of several pre-set implement tilt angle positions and for outputting a selection signal corresponding to the selected pre-set implement tilt angle position.

5,462,126
GROUND ROD DRIVER

James D. Wallace, P.O. Box 689, Athens, Tenn. 37303

Filed Apr. 25, 1994, Ser. No. 231,922

Int. Cl.^{6} B25D *17/08*

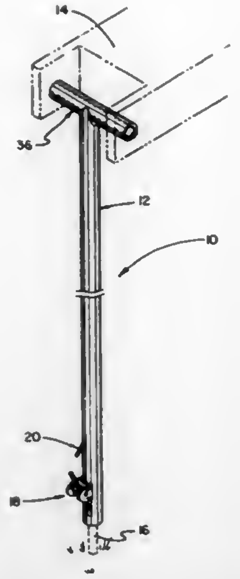
U.S. Cl. 173—53 1 Claim

1. A new and improved ground rod driver for installing electrical ground rods in the earth comprising:

an elongated steel prime mover engagement means;

a short tubular steel prime mover engagement member detachably pivotally affixed to an end of the prime mover engagement means;

an elongated tubular steel ground rod receiver coated with a layer of paint and having an inner surface, an outer surface, a first end portion affixed to the prime mover engagement member by a welded joint, a central portion having a length of between about four feet to twenty feet, and a second end portion further having a free opening with a diameter of about eleven sixteenth inches for slidably receiving a ground rod therein, a through hole formed thereon, a slot formed thereon at a location between the through hole and the opening, and a plurality of ribs affixed longitudinally to the outer surface thereof for providing added strength thereto;



- a steel rod engagement assembly operatively affixed to the second end portion of the tubular ground rod receiver wherein access to the slot of the ground rod receiver is provided, the rod engagement assembly having two spaced aligned fulcrum members each formed of substantially flattened plates with a through hole disposed thereon and with each plate coupled to the outer surface of the second end portion of the ground rod receiver with a welded joint, an elongated pivoting cam member with a through hole disposed thereon positioned between the fulcrum members and pivotally secured therebetween with a threaded bolt extended within the through hole thereof and extended within the through holes of the fulcrum member and secured with an engaging nut and with the cam member further having a cam surface formed of a substantially semicircular plate with a constant radius of curvature and a plurality of teeth formed upon at least half of a curving perimeter thereof and with the teeth of the cam surface extended through the slot on the second end portion of the ground rod receiver for engaging a ground rod slidably disposed therein and wherein rotation of the cam member in one direction results in increasing ground rod engagement and rotation in an opposing direction results in decreasing ground rod engagement; and
- a steel clamping setscrew having a T-shaped handle and a threaded portion threadedly affixed within the through hole of the tubular ground rod receiver and with the threaded portion used to frictionally engage and provide attachment of the ground rod with the ground rod receiver to generate an initial ground rod position and to permit extraction with the prime mover engagement means.

5,462,127

HOLDING DEVICE

Anders Svensson, Myrstigen 2, S 561 39 Huskvarna, Sweden

PCT No. PCT/SE92/00507, § 371 Date Dec. 30, 1993, § 102(e) Date Dec. 30, 1993, PCT Pub. No. WO93/01028, PCT Pub. Date Jan. 21, 1993

PCT Filed Jul. 6, 1992, Ser. No. 170,293

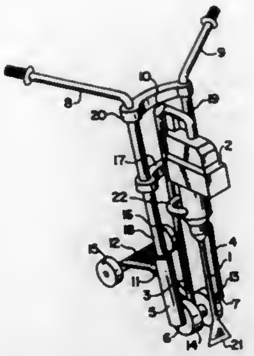
Claims priority, application Sweden, Jul. 12, 1991, 9102173

Int. Cl.^{6} B25D *17/24;* **B23D** *79/02*

U.S. Cl. 173—162.2 **5 Claims**

1. A holder for a device having an axially vibrating tool comprising:

fastening structure constructed and arranged to receive the tool so as to be mounted with respect thereto;



at least one shock absorber having upper and lower ends and disposed generally parallel with respect to a longitudinally axis of the tool when the tool is mounted with respect to said fastening structure;

wheel structure connected to lower ends of said at least one shock absorber so as to support the holder in wheel supporting relation during operation of the tool; and

handle structure extending from said upper end of said at least one shock absorber,

wherein a pair of spaced shock absorbers are provided, said handle structure including a pair of handles, each shock absorber being associated with a respective handle at an upper end thereof, said lower ends of said shock absorbers being coupled together by a shaft, said fastening structure being pivotally coupled to said shaft at a distal end thereof.

5,462,128

CUTTER BIT FOR USE IN DRILLING OPERATIONS

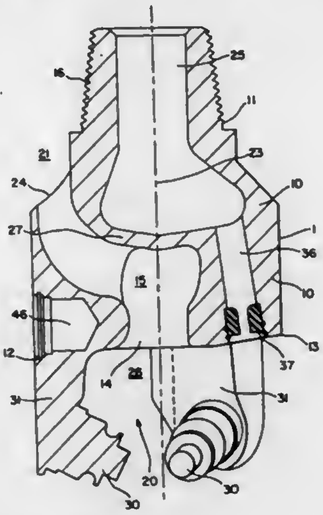
Clifford R. Gray, P. O. Box 234, North Beach, Western Australia 6023, Australia

Continuation-in-part of Ser. No. 134,386, Oct. 12, 1993, abandoned. This application Dec. 3, 1993, Ser. No. 161,789

Claims priority, application Australia, Jan. 20, 1992, PL5358

Int. Cl.^{6} E21B *10/18*

U.S. Cl. 175—339 **10 Claims**



1. A rotary drilling bit comprising:

(a) a body having (i) a threaded end adapted to be connected to a rotary tubular drill string and (ii) an inlet opening extending through the threaded end, said body having a full diameter lower body portion and an upper body portion which has at least a circumferential segment which is positioned radially inwardly with respect to the axis of rotation of the drill string and the bit connected thereto;

(b) a plurality of leg members extending downwardly from the periphery of the lower body portion and circumferentially spaced thereon whereby upon rotation of the bit the legs circumscribe a zone therebetween below the lower body portion;

(c) a cutting element mounted on each leg and extending inwardly into the zone;

(d) a supply flow passage extending through the body and interconnecting the bit inlet opening and the zone for delivering fluid to said zone; and

(e) an interior return flow passage extending upwardly through the lower body portion from said zone and exiting upwardly from the lower body portion opposite the circumferential segment of the upper body portion whereby a portion at least of the fluid delivered from the supply flow passage to said zone flows from said zone through the return flow passage in the body, bypassing the exterior of the lower body portion.

5,462,129

METHOD AND APPARATUS FOR EROSIVE STIMULATION OF OPEN HOLE FORMATIONS

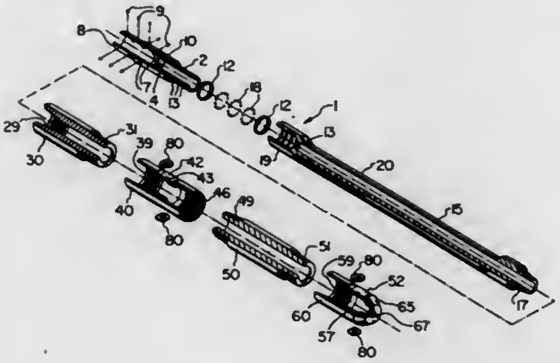
Jim E. Best, Cochrane, and Donald A. Smith, Innisfail, both of, Canada, assignors to Canadian Fracmaster Ltd., Canada

Filed Jun. 1, 1994, Ser. No. 252,407

Claims priority, application Canada, Apr. 26, 1994, 2122163

Int. Cl.^{6} E21B *7/18*

U.S. Cl. 175—67 **14 Claims**



1. A method of treating a section of unlined well bore comprising the steps of:

establishing a flow path through tubular means from the top of the well bore to a location opposite the section of unlined well bore to be treated;

pumping an erosive fluid through said flow path at a predetermined rate and pressure;

directing a stream of said erosive fluid against a surface of said section of well bore to be treated to cause the initiation of a cut thereinto; and

moving said stream of said erosive fluid past said surface to be treated to extend the cut formed therein in the direction of movement of said stream, said erosive fluid including a nonreactive gas therein in sufficient predetermined quantity to create an under balanced condition in said well bore.

5,462,130

DRILLING TOOL

Wolfgang Peetz, Fronreute, Germany, assignor to Hawera Probst GmbH, Ravensburg, Germany

Filed Mar. 30, 1994, Ser. No. 220,038

Claims priority, application Germany, May 5, 1993, 43 14 868.9

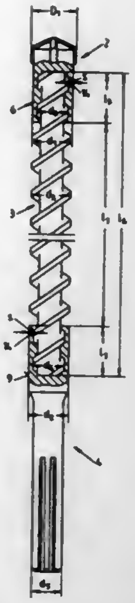
Int. Cl.^{6} E21B *17/042;17/22*

U.S. Cl. 175—323 **8 Claims**

1. A rock drill, comprising:

a drill head;

a clamping shaft; and



a helical shaft having a constant minor diameter and being interposed between said drill head and said clamping shaft, said helical shaft comprising:

a central portion having a first major diameter;

two end portions each having a second major diameter smaller than the first major diameter; and

a continuous conveying helix extending along said helical shaft for conveying rock dust; said conveying helix having opposite end portions corresponding to respective said end portions of said helical shaft; said drill head and said clamping shaft being threaded onto respective said end portions of said conveying helix to threadably fasten said helical shaft to said drill head and said clamping shaft; the major diameters being measured between diametrically opposite points on an outer face of said helix; said minor diameter being measured between diametrically opposite points of a root of said helix.

5,462,131

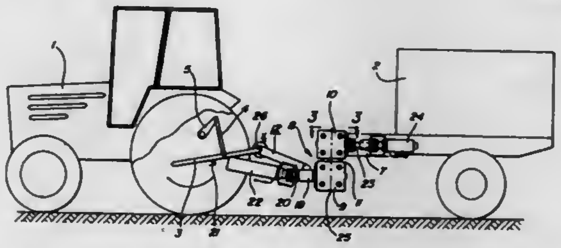
DEVICE FOR ATTACHING AN AGRICULTURAL IMPLEMENT TO A TRACTOR

Manfred Eidam, Wilthen; Michael Flanhardt, Cologne; Stefan Rauschenbach, Grosspostwitz, and Andreas Roth, Neunkirchen-Seelscheid, all of, Germany, assignors to GKN Walterscheid GmbH, Lohmar, Germany

Filed Sep. 27, 1994, Ser. No. 313,720

Int. Cl.^{6} B60K *25/06*

U.S. Cl. 180—14.4 **5 Claims**



1. A device for attaching an agricultural implement to a tractor and for establishing a driving connection between a power take-off shaft of the tractor and a drive or a driveline for driving the implement comprising;

a drive unit having first and second drives arranged one above the other, said first drive includes a first connecting journal which, by a driveshaft, is connectable to the power take-off shaft of the tractor;

said second drive arranged above said first drive, said second drive includes a second connecting journal connected to the drive or driveline of the implement, said two connecting journals arranged in planes extending parallel relative to one another, said first and second drives, via a pivot bearing, being pivotable around a pivot axis which is arranged at a right angle relative to the two connecting journals, said pivot enables the tractor and implement to pivot relative to one another around a vertical axis;

drawing means arranged between the second drive and the implement;

an attaching stirrup having two arms adapted for connection with one of two lower steering arms of the tractor and adapted for enabling the implement to be inclined relative to the tractor around a transverse axis;

a tilting bearing enabling the implement to be inclined sideways around a longitudinal axis relative to the tractor, with the longitudinal axis intersecting the transverse axis at a right angle and with the longitudinal axis being formed by the rotational axis of the first connecting journal of the first drive, the transverse axis is offset upwardly from the longitudinal axis towards the second drive and the tilting bearing is formed by a bearing housing supporting the first connecting journal and by a sleeve which is positioned on the bearing housing and forms part of the attaching stirrup.

5,462,132

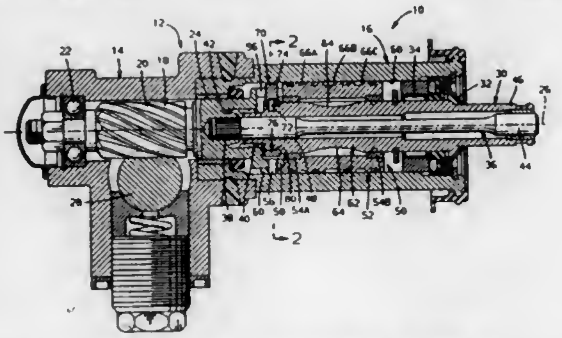
MOTOR VEHICLE POWER STEERING GEAR

Eugene T. Tanke, II, Vassar, and Tony M. Dodak, Birch Run, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 14, 1995, Ser. No. 422,401

Int. Cl.^{6} B62D *5/083*

U.S. Cl. 180—149 **4 Claims**



1. A power steering gear for a motor vehicle including

a tubular spool shaft connected to a manual steering wheel of said motor vehicle for rotation therewith about a centerline of said steering gear,

a pinion head connected to a pair of steered wheels of said motor vehicle and rotatable independently of said spool shaft about said centerline of said steering gear, and

a torsion bar inside said spool shaft having a first end rigidly connected to said pinion head and a second end rigidly connected to said spool shaft biasing said spool shaft to an on-center position relative to said pinion head,

characterized in that said steering gear includes a preload centering apparatus comprising:

a drive pin means rigidly connected to said spool shaft,

a C-shaped spring disposed around said spool shaft having a first resilient jaw and a second resilient jaw cooperating in clamping said drive pin means therebetween with a resilient preload on said drive pin means, and

an abutment means on said pinion head resiliently clamped between said first and said second jaws of said C-shaped spring with said resilient preload in said on-center relative position of said spool shaft including a first radial cantilever spring bearing against said first jaw and a second radial cantilever spring bearing against said second jaw,

each of said first and said second radial cantilever springs flexing upon an engagement with the corresponding one of said first and said second jaws of said C-shaped spring during forced oscillation of said pinion head through said on-center relative position of said spool shaft for cushioning said engagement and minimizing audible noise attributable to said engagement.

5,462,133

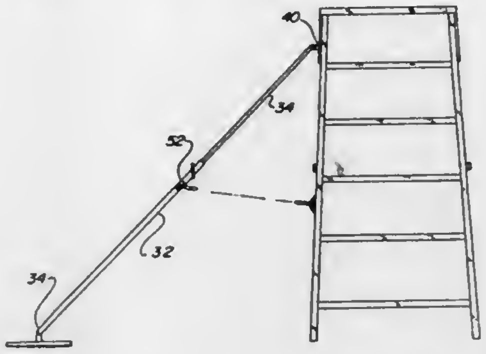
STEP LADDER STABILIZER

Warren R. Merrill, Jr., and Jacqueline M. Taylor-Merrill, both of 105 Glendale St., Morganton, N.C. 28655

Filed Oct. 20, 1994, Ser. No. 326,248

Int. Cl.^{6} E06C *5/36*

U.S. Cl. 182—172 **1 Claim**



1. A stepladder stabilizer for maintaining a stepladder in an upright configuration when in use comprising, in combination:

a pair of interchangeable rectangular horizontally positioned planar feet, each of the feet having an upper surface, a lower surface, and a bracket coupled to the upper surface and extended upwards therefrom with one foot further having a plurality of teeth extended downwards from the lower surface thereof and with the other foot further having a pad coupled to the lower surface thereof;

a leg further comprising:

an elongated straight rigid tubular lower segment having a sealed lower end and an open upper end with a threaded hole disposed therethrough, the lower end pivotally removably coupled to the bracket of one of the feet to define a first swivel joint that allows rotation of the lower segment in a first vertical plane; and

an elongated straight rigid cylindrical upper segment having an upper end and a lower end with the lower end telescopically received within the upper end of the lower leg;

a bracing joint having a first section and a second section, the first section further having a cylindrical shape and an axial bore formed thereon with a T-shaped cross section and a threaded bolt extended therefrom at a location aligned with and remote from the bore and with the bolt couplable to a step ladder through the use of a nut, the second section further having a cylindrical shape with an axial plug formed thereon and disposed within the bore of the first section and an end pivotally coupled to the upper end of the upper segment to thereby create a second swivel joint that allows the leg to be rotated in a second vertical plane that is positioned in perpendicular alignment with the first plane and also allows the leg to be rotated in a third plane that is positioned in coplanar alignment with the first plane, thereby providing two degrees of freedom;

a pair of chains with each chain having a first end coupled to the lower leg near its upper end with a coupling bracket and a second end couplable to a separate leg of the stepladder with another coupling bracket with each coupling bracket formed of a base plate and a U-shaped eyelet extended outwards from the base plate and with the chains used for limiting the extent to which the leg can be pivoted and rotated; and a locking pin having a threaded tip end and a T-shaped handle end and with the tip end threadedly disposed within the threaded hole of the lower leg and abuttable against the upper segment when tightened for setting the extension of the leg.

5,462,134
SCAFFOLDING CONSTRUCTION, IN PARTICULAR MEANS FOR JOINING TWO OR MORE OF ITS POSTS IN VERTICAL POSITION

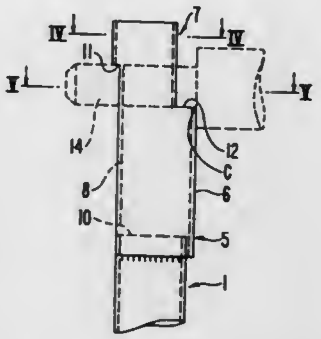
Johannes H. M. Van Helmond, Helmond, Netherlands, assignor to SGB Holdings Ltd. for These Research & Development Dept. Holland, Venray, Netherlands

Filed Dec. 14, 1993, Ser. No. 166,024

Claims priority, application Netherlands, Dec. 28, 1992, 9202269

Int. Cl.^{6} E04G *1/14*

U.S. Cl. 182—178 **17 Claims**



1. A scaffolding construction for allowing two or more posts to be joined together in an aligned position, comprising:
a post having a first end and a second end;
a bushing positioned on the first end, a portion of the bushing protruding beyond the first end of the post;
a recess located in the protruding portion of the bushing, the recess having a bottom and being open at a top, and extending across a portion of a circumference of the protruding portion of the bushing; and
a longitudinal groove having walls, a top and a bottom, the groove being formed in a wall of the protruding portion of the bushing opposite the recess, wherein the top of the groove is between the bottom of the recess and the end of the protruding portion of the bushing, and wherein the bottom of the groove is between the bottom of the recess and the post;
wherein the top of the groove and the bottom of the recess are spaced along the protruding portion of the bushing to 1) receive a pin of an additional post inserted through the recess and groove in a direction perpendicular to the longitudinal direction of the post and 2) guide the pin along the groove walls and support the pin by the recess when the additional post is swung into an aligned position with the post.

5,462,135
TREE STAND

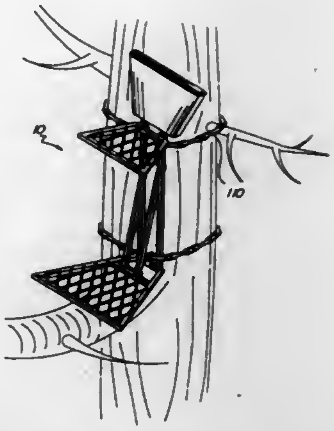
Robert D. Ambler, 1220 Plains Rd., Leslie, Mich. 49521, and Rick L. Green, 5781 Kinneville Rd., Eaton Rapids, Mich. 48827

Filed Jun. 30, 1994, Ser. No. 269,130

Int. Cl.^{6} A01M *31/00*

U.S. Cl. 182—187 **6 Claims**

2. A tree stand comprising:
a foot rest;
a back leg having a base end and a tip end with the base end coupled with the foot rest in an operable configuration and decoupled therefrom in a stowed configuration;



a front leg having a base end pivotally coupled to the foot rest at a location offset from the coupling of the foot rest with the back leg and a tip end pivotally coupled to the back leg, the front leg and the back leg upwardly orientable from the foot rest in an operational configuration and proximately orientable therewith in a stowed configuration;
a seat pivotally coupled to the rear leg and generally perpendicularly orientable therefrom in an operational configuration and upwardly orientable therefrom in a stowed configuration;
a seat back pivotally coupled to the rear leg and generally upwardly orientable therefrom in an operational configuration and proximately orientable with the seat in a stowed configuration; and
coupling means for coupling the back leg to a tree.

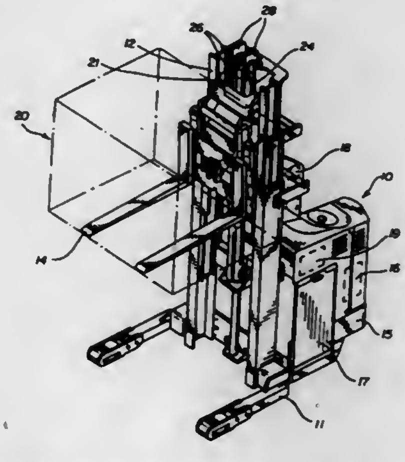
5,462,136
PREVENTION OF SLACK LIFT CHAINS ON A MAN-UP LIFT TRUCK

John Schoenmaker, Greene, and Gene R. Mathes, Binghamton, both of N.Y., assignors to The Raymond Corporation, Greene, N.Y.

Filed Mar. 3, 1994, Ser. No. 205,219

Int. Cl.^{6} B66B *9/20*

U.S. Cl. 187—223 **8 Claims**



1. A hydraulic circuit for controlling chain slackness in a lift mast, comprising:
a fluid reservoir;
a lift mast and a chain, said lift mast being capable of being raised or lowered hydraulically;
a lift cylinder operatively connected to said lift mast for raising and lowering said lift mast;
at least one fluid pump disposed between said fluid reservoir and said lift cylinder for pumping hydraulic fluid from said reservoir to said lift cylinder;

- a fluid flow valve disposed between said reservoir and said at least one fluid pump for regulating fluid flow to said lift cylinder, hence controlling the raising and lowering of said lift mast;
- a load-holding valve disposed between said lift cylinder and said reservoir;
- a transducer operatively connected to said fluid flow valve for sensing fluid pressure in said fluid flow valve, and, in response to a given low-pressure level, generating a signal; and
- a controller operatively connected to said transducer and said load-holding valve, said controller blocking fluid flow through said load-holding valve in response to said signal, whereby said lift mast will be prevented from lowering and said chain from slackening.

5,462,137
GYROPLANE ROTOR BRAKING UNIT

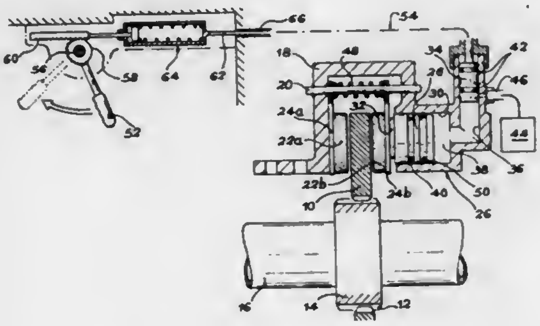
Jacques A. Aubry, Cabries, and Michel R. Bonfils, St. Cannat, both of, France, assignors to Aerospatiale Societe Nationale Industrielle, France

Continuation of Ser. No. 972,241, Nov. 5, 1992, abandoned. This application Oct. 4, 1994, Ser. No. 319,471

Claims priority, application France, Nov. 7, 1991, 91 13741

Int. Cl.^{6} B64C *27/32*

U.S. Cl. 188—72.6 **11 Claims**



1. A gyroplane rotor braking unit, comprising:
- a disk able to rotate with the rotor;
- a non-rotary support member adjacent to the disk;
- at least one friction lining anchored on said non-rotary support member;
- braking means able to apply the friction lining to at least one face of the disk, said braking means comprising at least one force amplification hydraulic actuator integrated into the support member, said hydraulic actuator including a motor piston, a free piston acting on said friction lining and having a section larger than that of the motor piston, and a control chamber formed in the support member between the motor piston and the free piston;
- a control member located in a gyroplane cockpit; and
- mechanical transmission means connecting the control member to the braking means, said transmission means comprising an input member engaged with the control member, a flexible control member received within a sheath fixed to a gyroplane structure and having a first end fixed to the motor piston, and a force limiting means connecting the input member to another end of the flexible control member, whereby the braking force which the friction lining applies to the disk upon actuation of said control member is limited to an upper, predetermined value.

5,462,138
BRAKE BAND

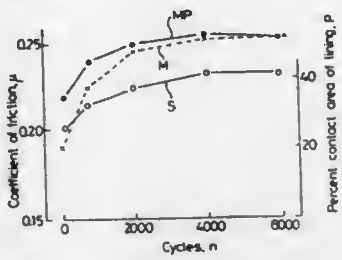
Toshiaki Wakisaka, and Hirofumi Nakagomi, both of Shizuoka, Japan, assignors to NSK-Warner K.K., Tokyo, Japan

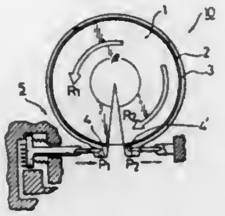
Filed May 26, 1994, Ser. No. 252,330

Claims priority, application Japan, May 31, 1993, 5-149784

Int. Cl.^{6} F16D *51/00*

U.S. Cl. 188—77 R **16 Claims**





1. A brake band-suitable for use in an automatic transmission, comprising a brake lining having an apply side and an anchor side, a surface of said brake lining at the apply side thereof having a percent contact area in the range of 10–40% when new produced by working, whereby said brake band has a greater contact area than an unworked brake band wherein the percent contact area is defined by a ratio of a total cross-sectional length of surface asperities to a given length of said lining.

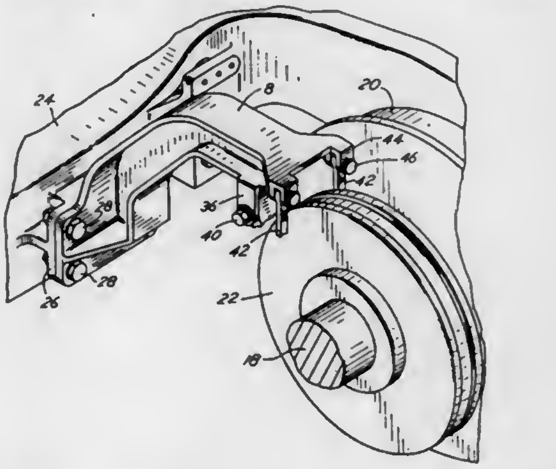
5,462,139
CAST BOLT-ON MOUNTING BRACKET FOR SUPPORTING A DISC BRAKE ON A RAILCAR TRUCK

William C. Jones, Jr., Reynoldsburg; Richard B. Polley, Gahanna, and Roger F. Sanzo, Columbus, all of Ohio, assignors to GSI Engineering, Inc., Columbus, Ohio

Filed May 4, 1994, Ser. No. 237,651

Int. Cl.^{6} F16D *65/14*

U.S. Cl. 188—206 R **7 Claims**



1. A mounting bracket assembly for use with a railcar truck for supporting a disc brake actuator assembly from the truck for braking a corresponding rail wheel axle, said disc brake actuator assembly including brake shoes arranged on opposite sides of a brake disc for engagement with a portion of said disc which moves

generally upwardly or downwardly depending on the direction of rotation of said disc, said mounting bracket comprising a metal bracket cast as a unitary member and having one end designed to be bolted onto a portion of a truck frame to fix the said bracket in a stationary position relative to said truck frame, and said metal bracket having an opposite end provided with depending lugs for supporting said disc brake actuator assembly, said one end of said metal bracket being generally flat and vertical and provided with bolt holes for bolting to a transom portion of said truck frame.

5,462,140

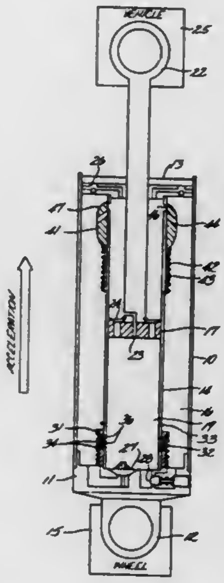
ACCELERATION SENSITIVE SHOCK ABSORBER

J. Guy Cazort, Corona Del Mar, and Donald G. Richardson, Jackson, both of Calif., assignors to Richardson Technologies, Ltd., Jackson, Calif.

Filed May 5, 1992, Ser. No. 878,850

Int. Cl.⁶ F16F *9/34*

U.S. Cl. 188—275 **28 Claims**



1. An acceleration sensitive shock absorber comprising:

an outer tube;

means for connecting the outer tube to a portion of a vehicle;

an inner tube fixed within the outer tube defining an annular reservoir between the inner and outer tubes for shock absorber fluid;

a piston sealed within the inner tube and connected to a shaft extending out of the shock absorber, the shaft including means for connecting the shaft to another portion of the vehicle, the piston dividing the inside of the inner tube into an upper chamber and a lower chamber;

means for passing fluid between the upper and lower chambers and the reservoir upon compression or extension of the shock absorber;

an orifice through the sidewall of the inner tube adjacent one of the chambers; and

a movable sleeve in the reservoir surrounding the portion of the inner tube containing the orifice for opening the orifice upon acceleration of the tubes in one longitudinal direction and increasing flow of fluid from one of the chambers into the reservoir in the event of longitudinal acceleration of the shock absorber tubes at more than a preselected magnitude.

5,462,141

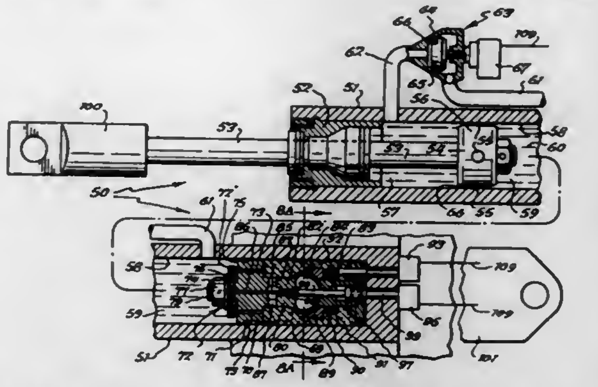
SEISMIC ISOLATOR AND METHOD FOR STRENGTHENING STRUCTURES AGAINST DAMAGE FROM SEISMIC FORCES

Douglas P. Taylor, N. Tonawanda, N.Y., assignor to Tayco Developments, Inc., North Tonawanda, N.Y.

Filed May 7, 1993, Ser. No. 59,246

Int. Cl.⁶ E04H *9/02;* **F16F** *5/00*

U.S. Cl. 188—280 **43 Claims**



1. A seismic isolator for providing hydraulic damping and frequency-dependent stiffening to a structure subjected to variable frequency seismic forces comprising a cylinder, a damping chamber in said cylinder, liquid in said damping chamber, an accumulator chamber for receiving liquid from said damping chamber, a piston having a first piston portion in said damping chamber and a second piston portion located outside of said damping chamber, a damping head on said piston in said damping chamber dividing said damping chamber into first and second subchambers, first liquid passing means operatively associated with said damping head for permitting liquid flow between said first and second subchambers, dividing means between said damping chamber and said accumulator chamber for primarily causing said liquid to be retained in said damping chamber, said first subchamber being located between said damping head and said dividing means, said second subchamber being located on the opposite side of said damping head from said first subchamber, and second liquid passing means operatively associated with said dividing means for permitting flow of liquid between said first subchamber and said accumulator, said first and second liquid passing means being so proportioned that said seismic isolator produces primarily damping forces and some stiffening forces when said seismic forces have velocities associated with their frequencies which are transmitted to said piston and which are below a predetermined value and said seismic isolator produces damping forces and increasing stiffening forces with a spring component as liquid is forced from said first subchamber through said second liquid passing means into said accumulator chamber as the velocities associated with said frequencies of said seismic forces which are transmitted to said piston increase toward and above said predetermined value.

5,462,142

FLUID OPERATED DAMPER WITH NONRELEASABLE COVER UNIT FOR ELECTROMAGNETIC VALUE

Günther Handke, Euerbach; Alfred Wirth, Schweinfurt, and Andreas Zietsch, Röthlein, all of, Germany, assignors to Fichtel & Sachs AG, Schweinfurt, Germany

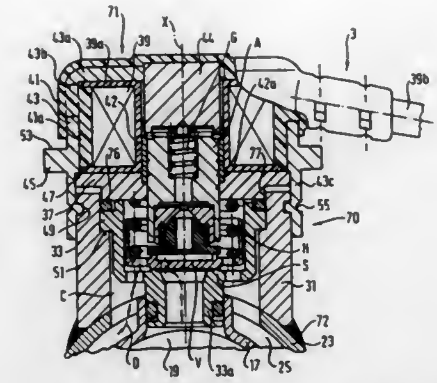
Filed Jul. 14, 1993, Ser. No. 91,664

Claims priority, application Germany, Jul. 15, 1992, 9209505.4 U

Int. Cl.⁶ F16F *9/46;* **B60G** *17/08*

U.S. Cl. 188—299 **34 Claims**

1. A fluid operated oscillation damper with an electromagnetically controlled valve unit for varying the damping force of said oscillation damper, said valve unit comprising a plurality of fluidic and electromagnetic valve unit components, at least part of said fluidic and electromagnetic valve unit components being accom-



modated within a valve unit compartment of said oscillation damper, said valve unit compartment being confined by compartment confining means, said compartment confining means comprising at least two housing units, one of said housing units being a basic housing unit attached to a part of said oscillation damper, a further one of said housing units being a cover unit attached to said basic housing unit, said cover unit being nonreleasably connected by nonreleasable connection means with said basic housing unit; and

said cover unit being partially made of metallic material and partially made of plastics material, said nonreleasable connecting means being provided between said basic housing unit and said metallic material of said cover unit.

5,462,143
CONTROLLABLE SHOCK ABSORBER FOR MOTOR VEHICLES

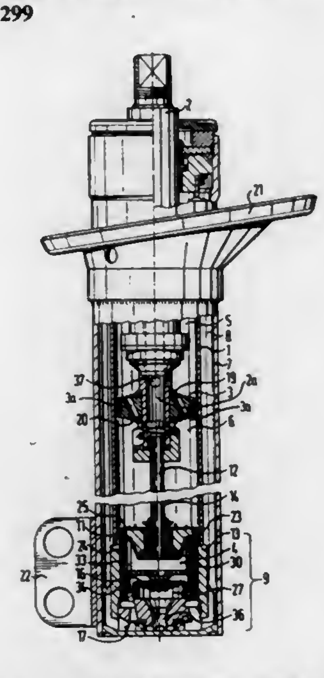
Thomas Sasse, Ennepetal, Germany, assignor to August Bilstein GmbH & Co. KG, Ennepetal, Germany

Filed Feb. 17, 1994, Ser. No. 197,600

Claims priority, application Germany, Feb. 17, 1993, 43 04 754.8

Int. Cl.⁶ B60G *17/08;* **F16F** *9/50*

U.S. Cl. 188—299 **12 Claims**



1. A shock absorber for an automotive vehicle, comprising

(a) a damping cylinder having a cylinder chamber containing damping fluid;

(b) a damping piston axially slidably received in said damping cylinder; said damping piston dividing said cylinder chamber into first and second work chambers; in a pressing phase said damping piston moving axially in a direction tending to reduce a volume of said second work chamber; in a pulling phase said damping piston moving axially in a direction tending to increase a volume of said second work chamber; said damping piston including a bore coupling the work chambers to one another;

(c) pressure-responsive valve means mounted on said damping piston for controlling said bore in said pressing and pulling phases;

(d) an axially hollow piston rod affixed to said damping piston and extending axially in said damping cylinder;

(e) an outer tube coaxially surrounding said damping cylinder and defining an equalizing chamber therewith;

(f) a bottom valve assembly provided in said second work chamber; said equalizing chamber being in communication with said second work chamber through said bottom valve assembly;

(g) means for defining a first bypass channel coupling said first work chamber with said equalizing chamber through said hollow piston rod by circumventing a bottom valve of said bottom valve assembly;

(h) means for defining a second bypass channel coupling said second work chamber with said equalizing chamber by circumventing said bottom valve; and

(i) setting means for varying cross-sectional flow passage areas of said first and second bypass channels as a function of relative rotary displacements between said damping cylinder and said piston rod.

5,462,144
IMPACT-ABSORBER DEVICE

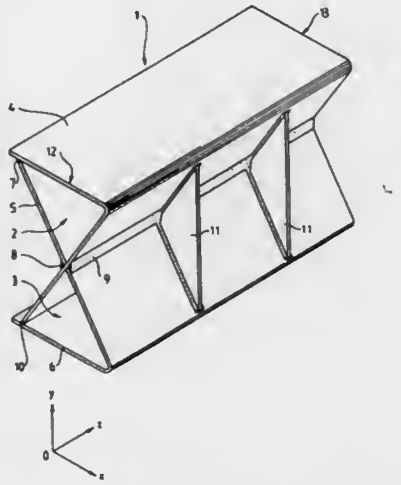
Pierre-Henri Guardiola, Chatenois Les Forges; Van-Tha Iv, Cravanche; Albert Metzger, Hartmannswiller; Louis-Marie Cleon, Paris La Defense, and Marwan Dannawi, Nantes, all of, France, assignors to Gec Alsthom Transport Sa, Paris, France

Filed Apr. 13, 1994, Ser. No. 227,010

Claims priority, application France, Apr. 23, 1993, 93 04823

Int. Cl.⁶ F16F *7/12;* **B61D** *17/00*

U.S. Cl. 188—377 **15 Claims**



1. An impact-absorber device comprising at least one deformable mechanical member absorbing by deformation the energy generated by an impact in a given direction wherein said member is made from thin plate, having a cross-section in a plane perpendicular to the direction of impact in the shape of a first and a second triangle, each having a common vertex;

wherein said first and said second triangle each have a respective base which is disposed opposite said common vertex; and

wherein said base of said first triangle is disposed opposite said base of said second triangle.

5,462,145

HYDROKINETIC LOCKUP TORQUE CONVERTER WITH LOCKUP CLUTCH

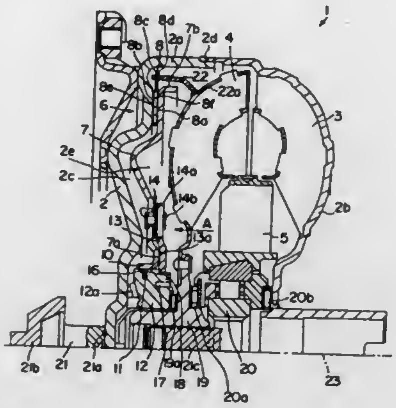
Joachim Gimmler, Dittelbrunn, Germany, assignor to Fichtel & Sachs AG, Schweinfurt, Germany

Filed Mar. 1, 1994, Ser. No. 204,064

Claims priority, application Germany, Mar. 3, 1993, 43 06 598.8

Int. Cl.^{6} F16H *45/02*

U.S. Cl. 192—3.29 **19 Claims**



1. A hydrokinetic lockup torque converter such as for an automobile, said lockup torque converter comprising:

a turbine wheel disposed on a first shaft;

a converter housing configured to be driven by a second shaft of an internal combustion engine and to house said torque converter;.

a lockup clutch disposed between said turbine wheel and said converter housing and configured to couple said turbine wheel to said converter housing;

said lockup clutch comprising:

a piston, said piston being disposed between said converter housing and said turbine wheel;

a friction plate, said friction plate being disposed between said piston and said converter housing;

an axis of rotation;

said torque converter defining:

an axial direction substantially parallel to the axis of rotation;

a circumferential direction about the axis of rotation;

a radial direction substantially perpendicular to the axial direction;

a first hub, said first hub being disposed and fastened to rotate with said converter housing about the axis of rotation;

said piston being disposed about said first hub to move in the axial direction along said first hub;

a hub disc, said hub disc being mounted on said first hub and disposed between said turbine wheel and said piston;

means for connecting said piston and said hub disc, said connecting means for attaching and driving said piston and said hub disc as a unit about the axis of rotation; and

said hub disc being fastened rigidly and immovably to said first hub to provide no play between said hub disc and said first hub in all three of: the axial direction, the circumferential direction, and the radial direction.

5,462,146

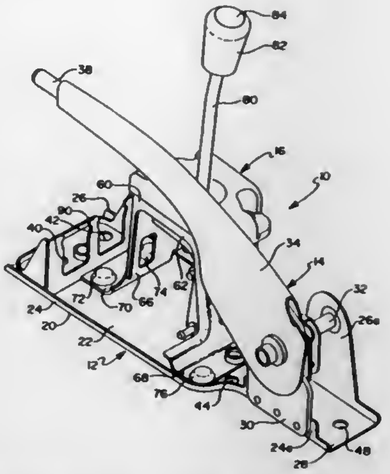
COMMON SHIFTER AND PARKING BRAKE MOUNTING

Miles G. Doolittle, Royal Oak, and Paul A. Zielesch, Clawson, both of Mich., assignors to Dura Mechanical Components, Inc., Troy, Mich.

Filed Jul. 6, 1993, Ser. No. 86,319

Int. Cl.^{6} B60K *20/04*

U.S. Cl. 192—4 A **8 Claims**



1. The combination of a transmission shifter, a parking brake actuator, and a mounting bracket assembly for mounting both the transmission shifter and the parking brake actuator to a vehicle structure characterized by the mounting bracket assembly comprising

an elongated member incorporating means for mounting the parking brake actuator thereto and mounting holes for mounting the elongated member to the structure, and

fastening means securing the shifter to the elongated member and including resilient means comprising spaced resilient pads interposed between the shifter and the elongated member and bonded to both, thereby providing a soft mounting of the shifter to the mounting bracket assembly and to the vehicle structure.

5,462,147

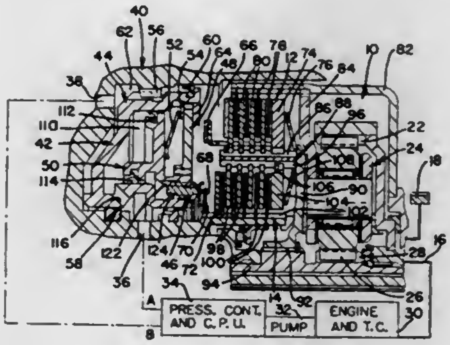
ENGAGEMENT CONTROL MECHANISM FOR A TORQUE TRANSMITTING DEVICE

James F. Sherman, Brighton, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 8, 1994, Ser. No. 255,600

Int. Cl.^{6} F16D *67/04*

U.S. Cl. 192—18 A **4 Claims**



1. A fluid operated torque transmitting means comprising:

a spring applied friction torque transmitting means;

a fluid pressure applied friction torque transmitting means;

a stationary housing;

a fluid operated piston means slidably disposed in said housing and being linearly movable in one direction in response to fluid pressure for enforcing disengagement of said spring applied torque transmitting means and for enforcing engagement of said fluid pressure applied friction torque transmitting means; and

overlap engagement adjustment means disposed on said fluid operated piston means and being responsive to a control pressure to establish a linear position of a control surface on the fluid operated piston means at which the engagement of the fluid pressure applied friction torque transmitting means begins relative to the beginning of disengagement of the spring applied torque transmitting means.

5,462,148
VEHICLE MULTI-RATIO TRANSMISSION

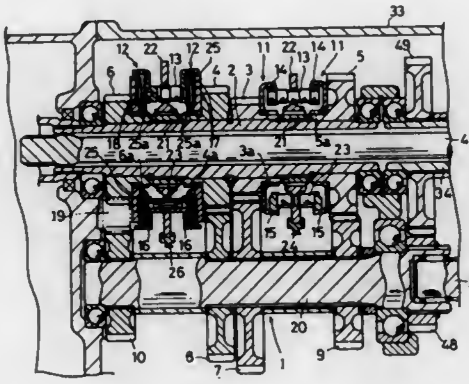
Toshiro Azuma, Sanda; Yasuo Seno, Itami; Hiroshi Kitagawara, Kobe, and Shusuke Nemoto, Yao, all of, Japan, assignors to Kanzaki Kokyukoki Mfg. Co., Ltd., Amagasaki, Japan

Filed Nov. 22, 1993, Ser. No. 156,039

Claims priority, application Japan, Dec. 22, 1992, 4-092369 U

Int. Cl.⁶ F16D *23/10;* **F16H** *3/08*

U.S. Cl. 192—48.3 **3 Claims**



1. In a vehicle multi-ratio transmission disposed between a drive shaft and a speed-change shaft and having a plurality of forward directional change-speed gear trains and a backward directional gear train, wherein each of the gear trains is actuated by a synchronizer clutch associated with said each gear train, said synchronizer clutch constituting a sole clutch means disposed between said drive shaft and said speed-change shaft for actuating said each gear train, the improvement characterized in:

that a multidisc-type synchronizer clutch (12) is associated with each of a heavily operated gear train of the forward directional change-speed gear trains and the backward directional gear train, whereas a cone-type synchronizer clutch (11) is associated with each of the other forward directional change-speed gear trains.

5,462,149
MONEY VALIDATORS

Peter J. Waine, Chobham, and Bernard J. Campbell, Sherfield-on-London, both of, United Kingdom, assignors to Mars Incorporated, McLean, Va.

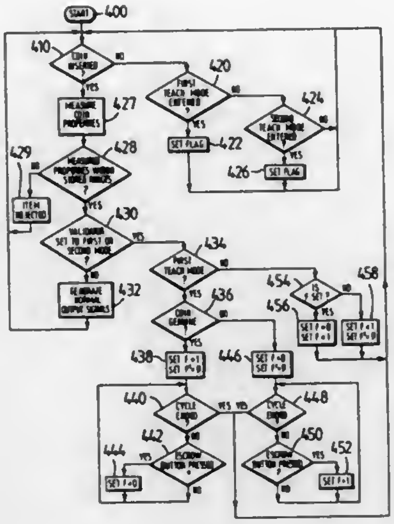
Filed Jun. 4, 1993, Ser. No. 70,424

Claims priority, application United Kingdom, Dec. 7, 1990, 9026619

Int. Cl.⁶ G07D *5/08;* **G07F** *7/04*

U.S. Cl. 194—206 **46 Claims**

1. A method of adjusting a money validator which is operable in a testing mode to compare measured properties of an item with a set of ranges to determine whether the item is genuine money, the validator being arranged to deliver items which have been tested and found genuine to a store, wherein the method comprises selecting from the store a non-genuine item which has erroneously been found by the validator to be genuine, and causing the validator to test the non-genuine item while the validator is in a teach mode, the validator being responsive to the measured-properties of the item for enabling or disabling at least one set of ranges in such a manner as to prevent future erroneous determination that items with such properties are genuine.



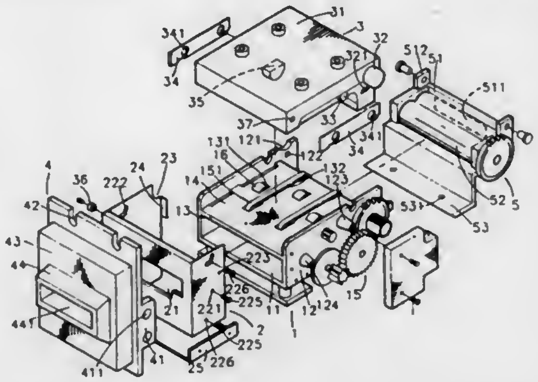
5,462,150
COLLECTING DEVICE FOR CURRENCIES

Yuan F. Chang, Taipei, Taiwan, Prov. of China, assignor to Gamemax Corporation, Taipei, Taiwan, Prov. of China

Filed May 9, 1994, Ser. No. 239,528

Int. Cl.⁶ G07F *7/04*

U.S. Cl. 194—206 **6 Claims**



1. A collecting device for currencies comprising a lower housing, a supporting bracket connected to the lower housing, an upper housing, a front lid positioned adjacent a forward portion of the lower and upper housings, and a rear housing positioned adjacent a rear portion of the lower and upper housings;

the lower housing having two side walls and upper and lower supporting plates extending between the two side walls, the side walls each having a cut-out, a clipping hole, a post and a locking post, the cut-outs receiving the upper housing, the upper and lower supporting plates defining a basic slot therebetween, a delivering space being defined between the two side walls and adjacent to the upper supporting plate, a plurality of rectangular openings and symmetrically disposed elongated slots being provided in the upper supporting plate, the lower housing further comprising,

conveyor means for conveying currency, the conveying means being mounted to at least one of the posts on at least one of the side walls, the conveying means including a pair of belts which are located in the elongated slots in the supporting plate, and

a pair of sensors located both in the basic slot and in the rectangular openings of the upper supporting plate,

the upper housing having two side walls and a lid, a projecting pin and a positioning dowel being provided on each of the side walls of the upper housing, each of the projecting pins being located adjacent to a hook, said hooks being engaged with the clipping holes of the side walls of the lower housing, the upper housing further comprising,

a guide plate on each of the side walls of the upper housing, each of the guide plates having a hole defined therein, the holes in the guide plates being received on the dowels of the side walls of the upper housing, and

an upper housing sensor for identifying currency, said upper housing sensor being mounted to the lid, and

the supporting bracket having a locking plate, the upper housing being inserted into the locking plate, the locking plate having a positioning slot defined therein, a screw passing through the positioning slot and being connected to the upper housing whereby the upper housing is movably mounted with respect to the lower housing.

5,462,151

METHOD AND APPARATUS FOR COIN VALIDATION

David M. Furneaux, Maidenhead, United Kingdom, assignor to Mars, Incorporated, McLean, Va.

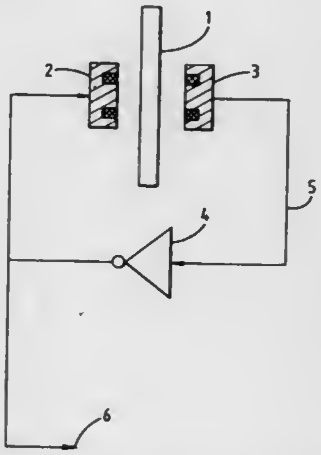
PCT No. PCT/GB92/00354, § 371 Date Aug. 4, 1993, § 102(e) Date Aug. 4, 1993, PCT Pub. No. WO92/15970, PCT Pub. Date Sep. 17, 1992

PCT Filed Feb. 27, 1992, Ser. No. 104,038

Claims priority, application United Kingdom, Feb. 27, 1991, 9104069

Int. Cl.^{6} G07D *5/08*

U.S. Cl. 194—318 **11 Claims**



10. A coin validator for accepting coins of a plurality of coin types, comprising:

a transmitter;

a receiver; and

a feedback path coupling the transmitter to the receiver wherein the feedback path causes a phase shift of substantially 180°, such that the transmitter, receiver and feedback path form a circuit which oscillates at a frequency dependent upon the coin type of a coin positioned between the transmitter and receiver, wherein the phase shift is independent of frequency of oscillation.

5,462,152

GRIPPING AND REMOVING ARTICLES FROM A GROOVED SURFACE

Lars G. A. Wadell, Aengelholm, Sweden, assignor to Nestec S.A., Vevey, Switzerland

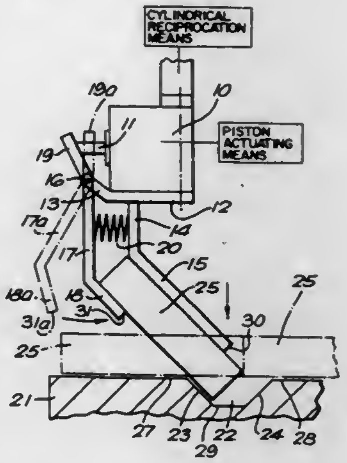
Continuation of Ser. No. 146,954, Nov. 3, 1993, Pat. No. 5,348,134. This application Sep. 9, 1994, Ser. No. 303,715

Claims priority, application European Pat. Off., Dec. 1, 1992, 92120460

The portion of the term of this patent subsequent to Sep. 20, 2011, has been disclaimed.

Int. Cl.^{6} B65G *47/22*

U.S. Cl. 198—409 **11 Claims**



1. A process for gripping and removing articles from a surface comprising:

transporting an article on a table surface having a groove therein to a position so that an edge of the article is positioned over the groove;

moving two jaw members of a gripping device vertically toward the table surface and contacting the article with a first jaw member to move the edge of the article into the groove and tilt the article so that a portion of a bottom surface of the article adjacent the table surface is lifted from the table surface;

moving a second jaw member towards the first jaw member and the bottom surface of the tilted article to contact the bottom surface of the tilted article so that opposing surfaces of the tilted article are gripped between the first and second jaw members;

moving the jaw members and gripped article away from the table surface; and

moving the second jaw member away from the first jaw member to release the gripped article from the jaw members.

5,462,153

CONTAINER HANDLING SYSTEM

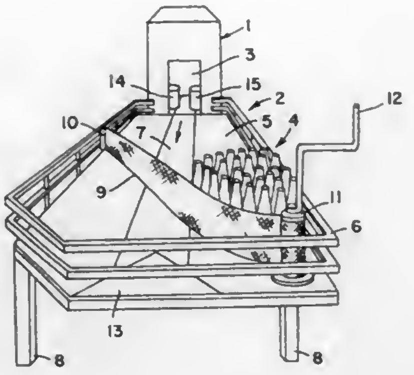
Henrik Friis, Stenløse, Denmark, assignor to Tomra Systems A/S, Asker, Norway

Filed Sep. 23, 1994, Ser. No. 311,397

Int. Cl.^{6} B65G *47/34*

U.S. Cl. 198—597 **19 Claims**

1. In a system that includes a reverse vending machine for empty liquid containers, such as empty beverage bottles, and a container collection table operatively connected with an outlet from said machine for collecting containers put into said machine by a customer and delivered out from said machine, and the table being provided with an endless conveyor belt with opposite longitudinal sides extending in a longitudinal direction of the table, and the table having two longitudinal surface regions arranged such that one of the longitudinal surface regions is provided alongside one of the longitudinal sides of the conveyor belt, and the other longitudinal surface region is provided alongside the other longitudinal



side of the conveyor belt, and the table having a periphery, the improvement comprising a band means extendable across each of the longitudinal surface regions of said table, said band means having opposite end portions and being longitudinally flexible and having an inherent lateral rigidity to permit said band means to be positioned substantially upright laterally with respect to the longitudinal surface regions of the table along the length of said band means, one end of said band means in said laterally upright position being secured to said table proximate one of said longitudinal surface regions, roller means being provided at said other longitudinal surface region for receiving the opposite end portion of the band means in said laterally upright position, actuating means operatively connected with said roller means for winding or unwinding said opposite end portion of said band means onto or from said roller means, said band means having a first extended slack length disposable on said table when said band means is unwound a predetermined amount from said roller means, said roller means reducing the amount of the first extended slack length on said table when said actuating means is actuated to wind the roller means, whereby in a wound mode said band means is wound to take up the slack of the first extended slack length to tension the band means and cause movement of said containers on said table transversely of said table from one of said longitudinal surface regions to the other of said longitudinal surface regions, and whereby in the unwound mode said band means has the first extended slack length on said table to permit gradual movement of said band means to a peripheral portion of said table by engagement of the first extended slack length of said band means with a growing accumulation of containers delivered onto said table from the reverse vending machine.

5,462,154

SLAT FOR TRANSPORTING DEVICE FOR EXTRUDED ARTICLES OF ALUMINUM OR ALUMINUM ALLOY

Kiyomitsu Matsushima; Hidekazu Odake; Tamotsu Ohashi, and Isamu Tsukada, all of Toyama, Japan, assignors to Yoshida Kogyo K.K., Tokyo, Japan

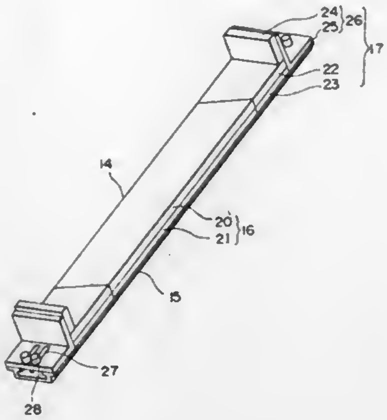
Filed May 26, 1994, Ser. No. 249,575

Claims priority, application Japan, Jun. 2, 1993, 5-029404 U; Nov. 30, 1993, 5-299610; Dec. 8, 1993, 5-065603 U

Int. Cl.^{6} B65G *15/44*

U.S. Cl. 198—699 **13 Claims**

1. A slat for a transporting device for an extruded article of aluminum or an alloy thereof, comprising an elongated base member having terminal ends and a guide secured to the transporting device, subsidiary heat-resistent members removably mounted at the terminal ends of said base member, and a main heat-resistant member arranged between said subsidiary heat-resistant members, wherein at least one of said subsidiary heat-resistant members is mounted to be slidable along the guide of said base member for removal of said main heat resistant member.



5,462,155

LINEAR VIBRATORY CONVEYOR

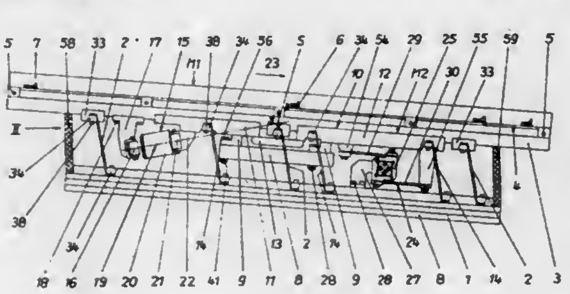
Adelbert Demar, Grossbardorf; Wolfgang Ebner, Saal; Horst Meinfelder, Seidingstadt, and Josef Köberlein, Bad Königshofen, all of, Germany, assignors to Josef Koberlein Maschinen- und Vorrichtungsbau, Germany

Filed Aug. 3, 1994, Ser. No. 285,064

Claims priority, application Germany, Aug. 4, 1993, 43 26 146.9

Int. Cl.^{6} B65G *27/28*

U.S. Cl. 198—760 **8 Claims**



1. A linear fibratory conveyor comprising:

a bottom plate (32);

a vibrating conveyor track (4);

spring elements (2) disposed between the bottom plate (32) and the vibrating conveyor track (4);

a trimming weight (8) linked to the vibrating conveyor track (4) and substantially determining a first vibrating mass (M1);

a countermass (10) substantially determining a second vibrating mass (M2);

spring elements (14) arranged between the bottom plate (32) and the countermass (10);

a vibratory drive (15) formed by an electromagnetic drive engaging with the first vibrating mass (M1) on the one hand and with the second vibrating mass (M2) on the other hand; and

a coupler (24) engaging between the first vibrating mass (M1) and the second vibrating mass (M2) and enforcing reciprocal vibration, wherein the coupler (24) has a coupler case (25) torsionally vibratable about a stationary axis (26) in relation to the bottom plate (32) and linked to the first vibrating mass (M1) and the second vibrating mass (M2) by way of a connecting rod (29, 30), and wherein the coupler (24) is separate from the vibratory drive (15).

5,462,156

CONVEYER DEVICE AND CONNECTION STRUCTURE OF ROLLERS INCORPORATING MOTORS

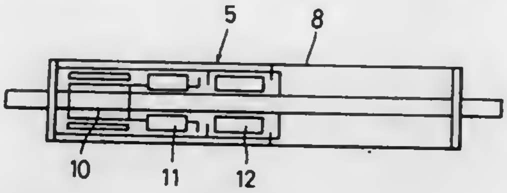
Kazuaki Kobayashi, and Kazuo Kobayashi, both of Hyogo, Japan, assignors to Itoh Electric Company Limited, Hyogo, Japan

Filed Sep. 7, 1994, Ser. No. 301,803

Claims priority, application Japan, Nov. 30, 1993, 5-068939 U

Int. Cl.^{6} B65G *13/06*

U.S. Cl. 198—788 **10 Claims**



1. A conveyer device comprising;

a plurality of motor-incorporated rollers each internally being provided with a motor, wherein at least two of said motor-incorporated rollers among said plural motor-incorporated rollers respectively have motors connected in series to each other.

5,462,157

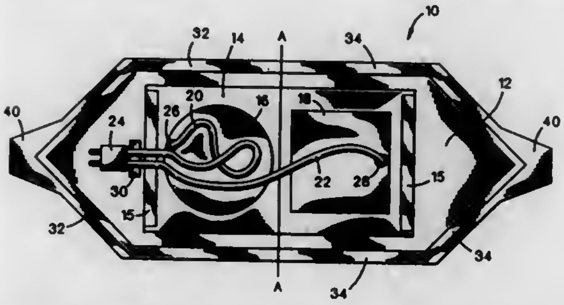
ELECTRODE PACKAGE

Gary A. Freeman, Newton Center, Mass., and Ward M. Hamilton, Amherst, N.H., assignors to ZMD Corporation, Wilmington, Del.

Filed Oct. 28, 1993, Ser. No. 144,665

Int. Cl.^{6} B65D *85/86*

U.S. Cl. 206—210 **22 Claims**



1. An electrode package in which one or more adhesively-applied skin electrodes may be sealed, said electrode package comprising:

a first adhesively-applied skin electrode,

an envelope comprising a sheet of material and adapted to open to a generally flat configuration, and

a releasable seal joining portions of said envelope to provide a sealed first compartment, said first electrode being positioned in said sealed first compartment and isolated from an external environment,

said package further comprising a first wall that defines a first interior surface facing the interior of said sealed first compartment, said first interior surface including a first electrode mounting surface attached to an adhesive portion of said first electrode, wherein said envelope may be opened to expose said first electrode to the external environment by releasing said releasable seal.

11. An electrode package in which one or more adhesively-applied skin electrodes may be sealed, said electrode package comprising:

a first adhesively-applied skin electrode,

a second adhesively-applied skin electrode,

an envelope comprising a sheet of material,

a releasable seal joining portions of said envelope to provide a sealed first compartment, said first electrode and said second electrode being positioned in said sealed first compartment and isolated from an external environment,

a first wall that defines a first interior surface facing the interior of said sealed first compartment, said first interior surface including a first electrode mounting surface attached to an adhesive portion of said first electrode,

a second wall that defines a second interior surface facing the interior of said sealed first compartment, said second interior surface including a second electrode mounting surface attached to an adhesive portion of said second electrode,

wherein said first and second interior surfaces face each other.

13. An electrode package in which one or more adhesively-applied skin electrodes may be sealed, said electrode package comprising:

a first adhesively-applied skin electrode,

a first compartment containing said first electrode,

a releasable seal adapted to seal said first compartment and maintain said first electrode in a sealed mode in which said first electrode is not exposed to an external environment,

a connector of said first electrode,

a second compartment outside of said first compartment and containing said connector of said first electrode, and

a barrier element positioned at said releasable seal and providing an electrically conductive path between the first electrode and the connector without exposing the first electrode to the external environment.

16. An electrode package in which one or more adhesively-applied skin electrodes may be sealed, said electrode package comprising:

a first adhesively-applied skin electrode,

a compartment containing said first electrode,

a releasable seal adapted to seal said compartment and maintain said first electrode in a sealed mode in which said first electrode is not exposed to an external environment,

a connector of said first electrode, the connector being exposed to the external environment, and

a barrier element positioned at said releasable seal and providing an electrically conductive path between said first electrode and said connector of said first electrode without exposing the first electrode to the external environment.

20. An electrode package in which one or more adhesively-applied skin electrodes may be sealed, said electrode package comprising:

a compartment for maintaining a first said electrode in either a sealed mode in which the first said electrode is not exposed to an external environment or an unsealed mode in which the first said electrode is exposed to the external environment, and

a barrier element between said compartment and the external environment, said barrier element providing an electrically conductive path between the first said electrode and a connector of the first said electrode that is located in the external environment,

wherein said barrier element comprises a body of the connector, the body providing the electrically conductive path between the first said electrode and the connector, and

wherein the body comprises a single piece of material and includes an integral hinge.

5,462,158

DISC PACKAGE

Robert G. Kramer, Cincinnati, Ohio, assignor to The C.W. Zumbiel Co., Cincinnati, Ohio

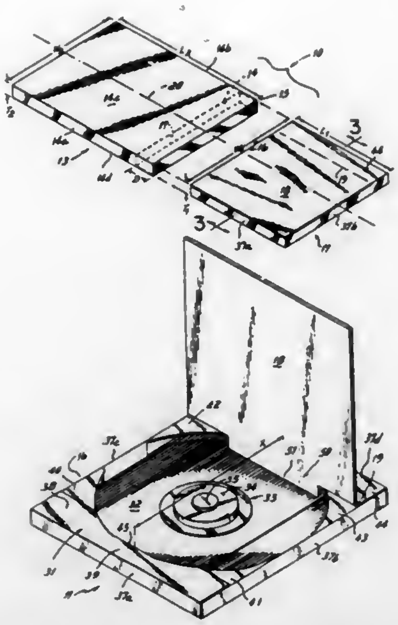
Filed Jul. 9, 1993, Ser. No. 89,250

Int. Cl.^{6} B65D *85/57*

U.S. Cl. 206—307 **12 Claims**

1. A disc package comprising

a carton for said disc, said carton having a thickness sufficient to receive said disc in storage relation, and said carton being of a first length,



a sleeve that defines a seat at one end of said sleeve, said sleeve having a thickness substantially the same as the thickness of said carton, said seat being sized and configured to receive one end of said carton in end to end seated relation therewith, said sleeve being of a second length, the combined length of said carton and said sleeve when in seated relation one with the other during distribution of said disc to a consumer being substantially greater than either one of said first length and said second length, and

a cover hingedly connected to said carton for enclosing said disc within said carton, said Cover being partially seated within said seat when said carton and said sleeve are seated in end to end relation, said cover thereby not being operable until said carton is removed from seated relation with said sleeve,

said carton and said sleeve being in end to end seated relation one with the other during distribution of said disc package to a consumer, said sleeve being removed from seated relation with said carton when use of said disc by said consumer is first desired with said sleeve being thereafter disposed of if desired, and said disc being removable from and returnable to storage relation within said carton by said consumer through use of said cover when said sleeve is not in seated relation with said carton.

5,462,159
MEDIA DISK STORAGE CONTAINER

Richard Roth; Paul D. Miller, and William L. Plumb, all of New York, N.Y., assignors to Queens Group, Inc., Long Island City

Continuation of Ser. No. 192,829, Feb. 7, 1994, Pat. No. 5,377,827, which is a continuation-in-part of Ser. No. 904,342, Jun. 22, 1992, Pat. No. 5,284,242. This application Sep. 13, 1994, Ser. No. 304,927

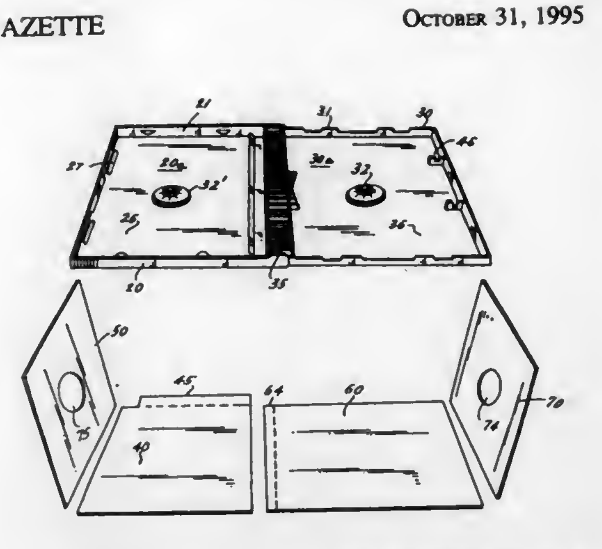
The portion of the term of this patent subsequent to Feb. 8, 2011, has been disclaimed.

Int. Cl.⁶ B65D *85/57*

U.S. Cl. 206—310 **14 Claims**

1. A media disk storage container, comprising:

a lid including a first panel having an inner surface and an outer surface, and a first sidewall extending at least partially around the periphery of the first panel, the outer surface of the first panel being recessed with respect to a peripheral edge of the first sidewall for receiving a corresponding first sheet of printed material, the first sidewall having a first recessed section continuous with the recess on the outer surface of the first panel for receiving a portion of the first sheet of printed material wrapped over the first sidewall;



a base including a spine, a second panel having an inner and an outer surface, and a second sidewall extending at least partially around the periphery of the second panel; and

means for hingedly connecting the lid and base together.

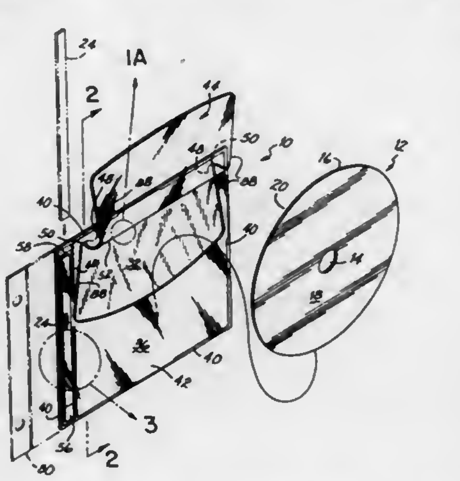
5,462,160
STORAGE CONTAINER WITH INTEGRAL FLAP

Ross O. Youngs, Dublin, Ohio, assignor to Univenture, Inc., Dublin, Ohio

Continuation of Ser. No. 998,957, Dec. 31, 1992, abandoned. This application Jul. 15, 1994, Ser. No. 276,055

Int. Cl.⁶ B65D *85/30;85/57*

U.S. Cl. 206—312 **43 Claims**



1. A storage container for storing a compact disc having an aperture and an edge, comprising:

a first flexible sheet;

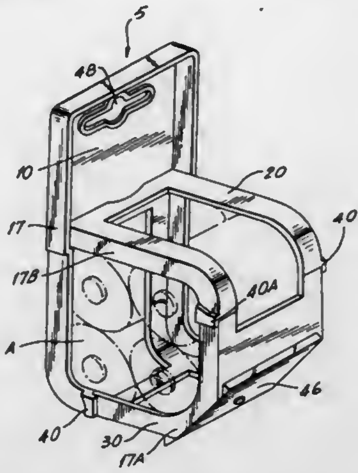
a nonwoven fabric sheet overlaying said first flexible sheet; and

a second flexible sheet overlaying said nonwoven fabric sheet opposite said first flexible sheet and joined to said first flexible sheet through said nonwoven fabric sheet to define a compact disc storage area, said second flexible sheet having a cut to define a flap portion which hinges along a hinge line and opens along an opening line to allow access to said compact disc storage area, said flap portion having a width that decreases in a direction toward said hinge line and said cut terminating at two ends and having arcuate regions adjacent said ends, whereby said arcuate regions resist tearing of said flap portion at said ends when accessing said compact disc storage area.

5,462,161
BATTERY CONTAINER AND DISPLAY PACKAGE

Daniel J. Halaburda, Rockaway, N.J.; David Dombrowski, Essex, and William H. Valls, Harwinton, both of Conn., assignors to Matsushita Electric Corporation of America, Secaucus, N.J.

Continuation of Ser. No. 7,172, Jan. 21, 1993, abandoned. This application Aug. 2, 1994, Ser. No. 284,263
Int. Cl.⁶ B65D *73/02*
U.S. Cl. 206—705 **9 Claims**



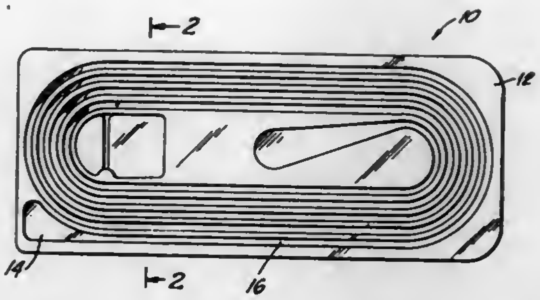
1. A package for the containing and displaying of articles comprising a long front panel having a generally J-shaped cross-section and having a first end, and a second end, a short rear panel having a generally J-shaped cross-section and having at least a first end, a bottom panel having a generally V-shaped cross-section and having a first end and a second end, said bottom panel connecting said front panel and rear panel, each of said panels having a first side-channel, and a second side-channel removed from said first side-channel, all of the respective first and second side-channels being longitudinally aligned, such that said respective first side-channels define an opening along a side of said package, and said second side-channels define an opening along the opposite side of said package, and a connecting means for securing the first end of said rear panel to said front panel at a position intermediate the first end and the second end of said front panel.

5,462,162
PACKAGED SYNTHETIC ABSORBABLE SURGICAL ELEMENTS

Donald S. Kaplan, Weston; Matthew E. Hermes, Easton; Ross R. Muth, Brookfield; David L. Brown, Wallingford, and Henry A. Holzwarth, Weston, all of Conn., assignors to United States Surgical Corporation, Norwalk, Conn.

Continuation of Ser. No. 911,981, Jul. 10, 1992, Pat. No. 5,366,081, which is a continuation of Ser. No. 568,089, Aug. 16, 1990, Pat. No. 5,222,978, which is a continuation-in-part of Ser. No. 89,735, Aug. 26, 1987, abandoned, Ser. No. 221,308, Jul. 19, 1988, Pat. No. 5,051,272, Ser. No. 388,152, Aug. 1, 1989, abandoned, Ser. No. 395,476, Aug. 18, 1989, abandoned, and Ser. No. 491,215, Mar. 9, 1990, Pat. No. 5,019,093, which is a continuation of Ser. No. 344,745, Apr. 28, 1989, abandoned, and a continuation-in-part of Ser. No. 227,699, Aug. 3, 1988, abandoned, and Ser. No. 89,732, Aug. 26, 1987, abandoned. This application Jun. 20, 1994, Ser. No. 262,203

The portion of the term of this patent subsequent to Nov. 22, 2011, has been disclaimed.
Int. Cl.⁶ A61B *17/06*
U.S. Cl. 206—339 **8 Claims**



1. A package for a surgical suture which comprises:

a) an outer envelope of substantially moisture impervious material characterized by longitudinal side edges and top and bottom transverse edges, the envelope including first and second walls, said second wall adhered to said first wall along the bottom transverse edges and portions of the first wall longitudinal side edges with the top transverse edge of said second wall terminating a distance below the top transverse edge of said first wall such that said second wall is shorter than said first wall to define an accessible pocket between them for receiving a surgical suture retainer member;

b) a peelable closure flap adhered to the outer peripheral portion of said first wall along the top transverse edge and the remaining portions of the first wall longitudinal side edges not adhered to the second wall, the peelable closure flap further adhered to the second wall and sealing access to the pocket of the envelope, the closure flap terminating in a grip-facilitating tab whose free edge terminates a distance away from the top and bottom transverse edges of the outer envelope; and

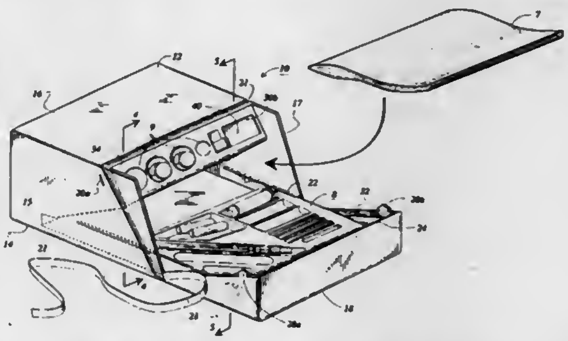
c) a surgical suture retainer member manufactured from hard plastic material and received within the pocket of the outer envelope and a surgical suture disposed in said retainer member,

whereby said package is opened by peeling of said closure flap away from the second wall and at least the longitudinal side edges of the first wall.

5,462,163
HOLDER FOR SHARP MEDICAL INSTRUMENTS WITH INDIVIDUAL ANGULARLY PRESENTED ENCASEMENTS

Arnold J. Berry, Atlanta, Ga., assignor to Emory University, Atlanta, Ga.

Continuation of Ser. No. 45,511, Apr. 8, 1993, abandoned. This application Oct. 4, 1994, Ser. No. 318,563
Int. Cl.⁶ B65D *83/10;69/00*
U.S. Cl. 206—370 **14 Claims**



1. A holder for the safe packaging, intermittent storage and disposal of needles and sharp medical instruments comprising a puncture-proof container means for use in storing, holding and disposing of needles and sharp medical instruments, said container means having a sealable cover with sealing means associated therewith, said sealing means comprising means for ensuring that no liquid can enter or exit said holder when said cover is closed and such that said container means and any contents therein can be sealed, sterilized, and remain sterile until said cover is unsealed and opened, said container means also having a bottom surface, a right side, a left side, a back panel and a top panel which comprises

a portion of said cover, said top panel extending perpendicularly from said back panel, and including a face panel which slopes toward the bottom surface; and

one or more discrete encasements each having a bottom end and being disposed parallel to said left and right sides and perpendicular to said face panel with an aperture on said face panel in communication with each encasement for receiving and holding needles, devices with needles and sharp instruments within said each encasement with the sharp or pointed end directed toward said bottom end, each encasement being disposed at an angle relative to vertical and between 0° and 90° for presenting received needles and sharp medical instruments at an angle oriented toward a user.

5. A self-contained medical procedure kit comprising:

a housing having a top surface, a bottom surface, a right side, a left side, a front end and a back end;

a cover comprising said front end, a portion of said right and left sides and a portion of said top surface, said cover also having a plurality of sides sealable to said housing; and being movable from a closed position to an open position;

sealing means for sealing said cover to said housing when said cover is in its closed position for preventing leakage of fluids or solids from inside said housing to outside said housing and for maintaining sterility of said kit before it is initially opened;

an angled panel connected to said top surface and perpendicularly positioned between said left and right sides and having one or more apertures, one or more encasements respectively communicating with said one or more apertures and suitable for receiving needles, devices with needles, and sharp instruments, and one or more encasements in addition communicating with the interior of said housing; and

said kit is comprised of material which is sterilizable.

5,462,164

HIGHTIGHT FILM PACKAGE

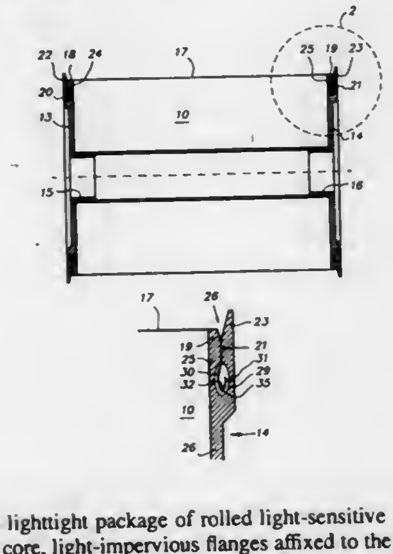
Herman Cornelissen, and Paul Wouters, both of c/o Agfa-Gevaert N.V., Septestraat 27, B 2640 Mortsel, Belgium

Filed Sep. 7, 1994, Ser. No. 301,579

Claims priority, application Netherlands, Sep. 17, 1993, 93202699

Int. Cl.⁶ B65D *85/67;85/672*

U.S. Cl. 206—389 **14 Claims**



1. In a lighttight package of rolled light-sensitive material comprising a core, light-impervious flanges affixed to the opposite ends of said core, a roll of light-sensitive material wound on said core between said flanges, and a light-shielding circumferential wrapper enclosing said roll, the improvement wherein each of said flanges has a circumferential groove therein extending from an outer periphery of the flange radially inwardly and having a generally radially outwardly opening mouth, and said wrapper has side margins thereof folded radially inwardly into through said mouth and retained within said groove.

5,462,165

PAPER REEL, PAPER REEL UNPACKING STATION FOR UNPACKING THE PAPER REEL, AND PROCESS FOR UNPACKING THE PAPER REEL

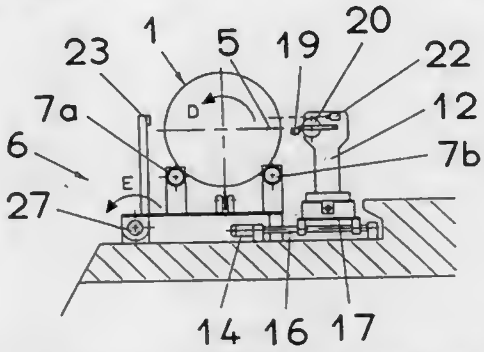
Walter Thuer, Friedberg, Germany, assignor to MAN Roland Druckmaschinen AG, Offenbach, Germany

Filed Mar. 29, 1994, Ser. No. 219,640

Claims priority, application Germany, Apr. 1, 1993, 43 10 675.7

Int. Cl.⁶ B65D *85/66;* **B65B** *43/26*

U.S. Cl. 206—410 **24 Claims**



10. A paper reel unpacking station for unpacking a paper reel having a curved outer surface enclosed by a packaging layer, a tear-off ribbon arranged between the paper reel and the packaging layer, and a grippable member connected to the tear-off ribbon, the unpacking station comprising: two rotatable rolls arranged parallel to one another so as to support and rotate the paper reel; and a tear-off table, the paper reel, together with the rotatable rolls, and the tear-off table being movable relative to one another in a longitudinal direction of the paper reel, the tearoff table having gripping means for gripping the grippable member of the tear-off ribbon so that the tear-off ribbon can be pulled off the paper reel in the longitudinal direction of the paper reel by one of moving the tear-off table away from the paper reel and moving the paper reel away from the tear-off table, the tear-off table further having a pulling device provided so as to pull the tear-off ribbon in a circumferential direction of the paper reel by rotating the paper reel while simultaneously pulling with the pulling device.

5,462,166

PACKAGE SEAL FOR INDIVIDUALLY PACKAGED SANITARY NAPKINS

Gerald T. Minton, Greenville, N.C.; Lisa J. Horwich, Cincinnati, and Steven R. Gilbert, Fairfield, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Feb. 14, 1994, Ser. No. 194,891

Int. Cl.⁶ A61F *13/20*

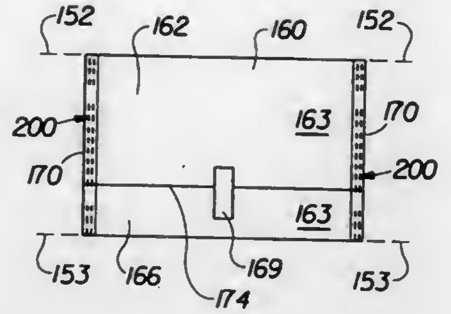
U.S. Cl. 206—440 **26 Claims**

1. An individually packaged component comprising:

a flexible wrapper, the flexible wrapper folded to have overlying wrapper portions extending intermediate a pair of spaced apart wrapper edges;

a disposable absorbent article disposed intermediate the overlying portions of the flexible wrapper, the disposable absorbent article comprising a liquid pervious topsheet, a liquid impervious backsheet, and an absorbent core disposed intermediate the topsheet and the backsheet;

wherein the folded wrapper comprises a releasable seal along each of the pair of spaced apart edges for joining the overlying portions of the wrapper; each releasable seal comprising an array of bonds, wherein the ratio of bond width to bond

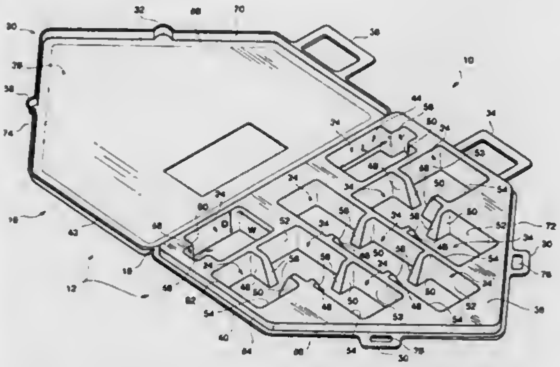


spacing in a direction generally perpendicular to the wrapper edge is less than the ratio of bond width to bond spacing in a direction generally parallel to the wrapper edge; and wherein the releasable seal has a bonded area ratio of no more than 50 percent.

5,462,167
SPORTS CARD TRAY AND STORAGE ORGANIZER DEVICE

Russell E. Polinski, Barrington, and John K. Morrow, Arlington Heights, both of Ill., assignors to Russell Specialties Corporation, Cary, Ill.

Filed Feb. 22, 1993, Ser. No. 20,762
Int. Cl.^{6} B65D *85/00*
U.S. Cl. 206—455 **18 Claims**

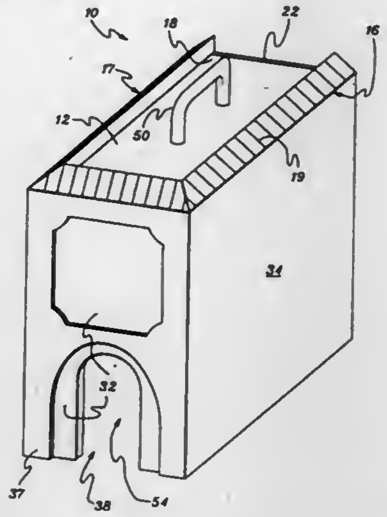


1. A sports card tray storage and organizer device comprising a housing designed to receive sports card and including first and second tray sections, said first tray section being a card receiving tray section and said second tray section being a card sorting and device closing tray section, each tray section being adjacent to and hingedly connected to the other by a living hinge and being movable between (a) a first position where said first tray section and said second tray section are in a tray section end-to-end position for establishing a card access and card sorting tray arrangement and (b) a second, device closed position with said second tray section received over said first tray section for establishing a card storage assembly, said first tray section having a plurality of card receiving pockets or recesses extending inwardly from an inside surface thereof and said second tray section having a generally planar surface sufficient to cover closely said plurality of card receiving pockets or recesses of said card receiving tray section when said second tray section is folded onto said first tray section, and latching means for latching said two tray sections together, said first and second tray sections, when closed and latched together, forming the shape of at least one of: a symbol associated with a particular sport, a piece of equipment associated with a particular sport, or an emblem associated with a particular sport.

5,462,168
BEVERAGE CONTAINER COVER

David L. Oberhelman, 2 Queens La., Queensbury, N.Y. 12804, and Lisa Herriman, 12 Third St., Glens Falls, N.Y. 12801

Filed May 25, 1994, Ser. No. 249,759
Int. Cl.^{6} B65D *65/00;65/10*
U.S. Cl. 206—457 **18 Claims**



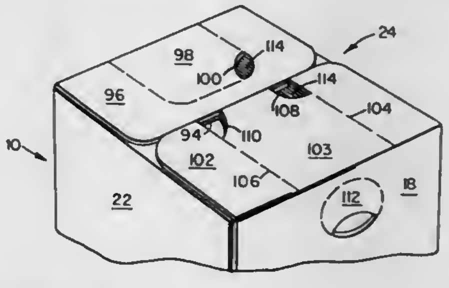
1. A beverage container cover for covering a beverage container including a spout, said beverage container cover comprising:

a housing having an open bottom for receiving said beverage container, said housing including a front face having an edge defining said open bottom;
a handle connected to said cover for lifting said beverage container cover;
a decorative panel disposed on said front face; and
an aperture located on said front face for protrusion of said spout.

5,462,169
COMPOSITE PACKAGE FOR HAZARDOUS MATERIALS

Douglas M. Dygert, Olive Branch, Miss., and Clifford B. Radcliffe, Yorktown Heights, N.Y., assignors to Ring Can Corporation, Oakland, Tenn.

Filed Sep. 23, 1994, Ser. No. 311,272
Int. Cl.^{6} B65D *21/02;* **B67D** *5/00*
U.S. Cl. 206—521 **15 Claims**



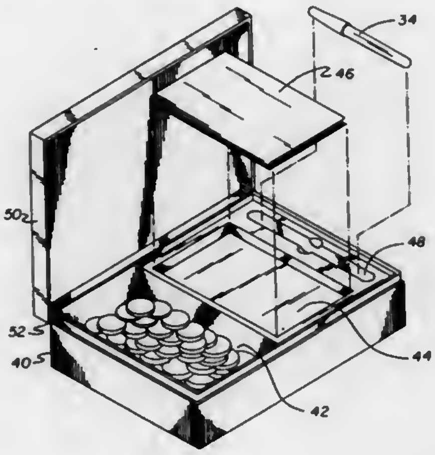
1. A composite package comprising:

an outer rectangular paperboard box and a thin-walled, rectangular plastic bottle mounted within said box;
said bottle having a bottom wall, vertical front, rear, and first and second side walls extending upwardly from said bottom wall, a top wall extending across said vertical walls and defining a fluid containing chamber therewith, a pouring spout formed on said top wall adjacent said front wall, a handle formed on said top wall and extending between said pouring spout and said rear wall, said handle having an air passageway communicating with said chamber adjacent said rear

wall, an air vent spout formed on said handle in communication with said passageway;

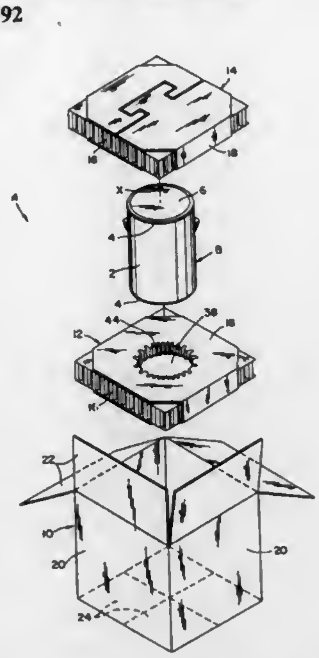
said paperboard box including front, rear, and first and second side walls adjacent the front, rear, and first and second side walls, respectively, of said bottle, said box having a top flap assembly including first and second side flaps connected to the side walls of said box and folded substantially perpendicular to said side walls, front and rear flaps connected to said front and rear walls of said box and folded over said side flaps, said front flap having a tear-away section overlying said spout and being removable when said fluid is to be poured from said spout, said rear flap having a tear-away section overlying said handle and being removable to provide access to said handle, a tear-away section on said rear wall of said box to provide access to said vent spout.

5,462,170
AUTOGRAPH BUTTON COVER
George S. Colgate, 3124 19th Street Rd., Greeley, Colo. 80631
Filed Sep. 14, 1994, Ser. No. 305,595
Int. Cl.^{6} B65D *85/58;* **A44B** *1104;1114*
U.S. Cl. 206—574 **7 Claims**



1. A new and improved autograph button cover assembly comprising, in combination:
   - a button cover formed of a transparent elastomeric material having a circular upper surface with a cylindrical side wall extending at right angles from the upper surface and with an in-turned circular flange with an aperture extending therethrough;
   - a cylindrical button adapted to receive the cover, the button being of a size so as to have its exterior cylindrical periphery located in contact with the interior surface of the side wall of the cover, the button also having apertures therethrough for stitching to a piece of apparel;
   - a pen with indelible ink therein adapted for signing the cylindrical surface of the cover; and
   - a box having a first zone for the storage of covers, a second zone for the receipt of an instructional booklet on the method of use and a third zone for the receipt of the pen.
2. An autograph button cover system comprising:
   - a button cover formed of a transparent elastomeric material having a circular upper surface with a cylindrical side wall extending at right angles from the upper surface and with an in-turned circular flange with an aperture extending therethrough; and
   - a cylindrical button adapted to receive the cover, the button being of a size so as to have its exterior cylindrical periphery located in contact with the interior surface of the side wall of the cover.

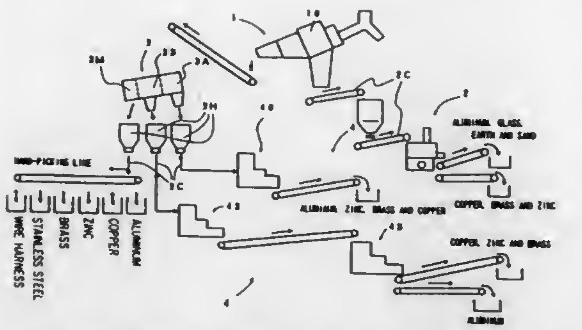
5,462,171
SHOCK-ABSORBING PACKAGE
John F. Moog, St. Louis County, and Buford R. Strauser, St. Charles County, both of Mo., assignors to The Timken Company, Canton, Ohio
Filed Mar. 18, 1994, Ser. No. 210,623
Int. Cl.^{6} B65D *81/02*
U.S. Cl. 206—592 **14 Claims**



1. A package for protecting a rigid object, said package comprising a box having an axial directed space defined by side walls and opposite ends spaced apart in the axial direction of said side walls, with one end of said box open to receive the rigid object; an object supporting insert at one end of said box, the insert including a pad containing honeycomb cells with cell axes parallel to the axial direction of said side walls and providing a region of crushed honeycombs providing within the pad to form a pocket which opens to receive and cushion the rigid object; a wrap comprising a panel extending over the pad and being formed with an opening aligned with said region of crushed honeycomb such that the wrap will support the rigid object laterally, the pad being of polygonal configuration and the panel extending out to the sides of the pad, and the corners of the pad projecting beyond the panel so impacts directed at the corners of the pad will collapse the honeycomb of the pad and the impact will be absorbed.

5,462,172
NONFERROUS MATERIAL SORTING APPARATUS
Masakatsu Kumagai, Aichi, and Yoshihisa Fujita, Saitama, both of, Japan, assignors to Toyota Tsusho Corporation; Toyota Metal Co., Ltd., both of Nagoya, and Senko Kogyo Co., Ltd., Tokyo, all of, Japan
Filed Mar. 23, 1994, Ser. No. 216,417
Claims priority, application Japan, Mar. 31, 1993, 5-098640
Int. Cl.^{6} B03B *4/00;* **B07B** *9/00;13/00*
U.S. Cl. 209—12.1 **21 Claims**

1. A nonferrous material sorting apparatus, comprising:
   - a first screening device for screening materials of not more than a minimum reference size;
   - a first sorting device for sorting the materials, which are not more than the minimum reference size and screened by the first screening device, according to a weight ratio by employing an inclined vibrating table supplied with air;
   - a second screening device for screening the materials screened by the first screening device and larger than the minimum reference size into materials of at least two kinds of reference sizes larger than said minimum reference size; and



a second sorting device including a fluidized bed for sorting the materials screened by the second screening device by adding solid constituent materials to said materials screened by the second screening device and sorting according to whether or not a specific gravity of the screened materials is large relative to that of said solid constituent materials of said fluidized bed.

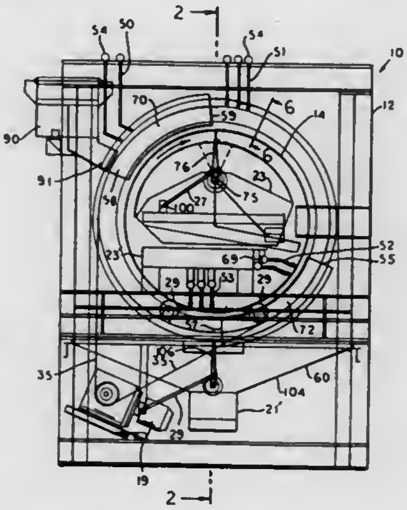
5,462,173
ROTATING DRUM MAGNETIC SEPARATOR

Richard Darling, Erie, Pa., assignor to Eriez Manufacturing Company, Erie, Pa.

Filed Mar. 4, 1994, Ser. No. 205,693

Int. Cl.^{6} B03C *1/14*

U.S. Cl. 209—39 **24 Claims**



1. A magnetic separator comprising a support means;

a drum supported on said support means;

said drum comprising a stack of spaced rings;

said rings each comprising an outwardly facing channel extending continuously around each said ring;

said outwardly facing channels each being defined by an annular bottom and two spaced flanges fixed to said annular bottom;

said outwardly facing channels extend outwardly from said drum;

spacer means engages said flanges holding said outwardly facing channels in spaced relation to one another defining spaces between two said rings;

entrapping means, made of magnetic material, disposed in said spaces between said rings;

magnets supported on said support means;

said magnets being disposed in said outwardly facing channels and adapted to direct a magnetic field through said entrapping means;

drive means connected to said rings to rotate said drum and to bring each said entrapping means successively through said magnetic field from said magnets;

a center hopper in said drum is supported on said support means;

said center hopper having axially extending partition means dividing said center hopper into a magnetic section and a non-magnetic section;

feed means supported on said support means above said drum to feed a mixture of magnetic material and non-magnetic material onto said entrapping means;

said non-magnetic section of said center hopper being disposed below said magnets to receive said non-magnetic material; and,

said magnetic section being disposed in spaced relation to said magnets to receive magnetic material.

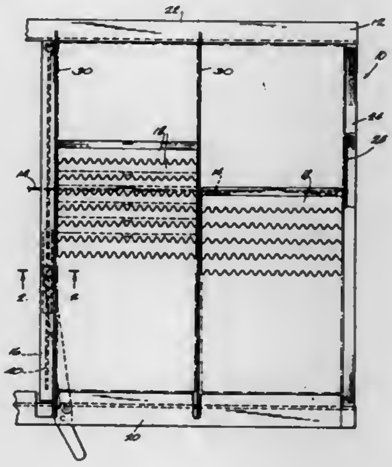
5,462,174
SIEVE APPARATUS FOR COMBINE

Thomas G. Truckenbrod, Mendota, and Benjamin E. Ramp, Normal, both of Ill., assignors to HCC Inc., Mendota, Ill.

Filed Apr. 22, 1994, Ser. No. 231,256

Int. Cl.^{6} B07B *1/49*

U.S. Cl. 209—394 **16 Claims**



1. A sieve assembly for a combine comprising

a frame including a pair of laterally spaced, elongated side members and at least one divider member disposed between and extending parallel to said side members, said side and divider members including a plurality of longitudinally spaced, circular apertures having an inside diameter and aligned in rows;

a circular wire extending through each row of said side and divider member apertures, each of said wires having an outside diameter and including a major portion having a longitudinal axis and an offset portion including a longitudinally extending retainer leg spaced radially outwardly from and parallel to said longitudinal axis and a pair of connecting legs connected between the opposite ends of said retaining leg and said major portion, said connecting legs extending at an angle from said major portion and each including bends having a radius at the connection with said major portion and with said retaining leg;

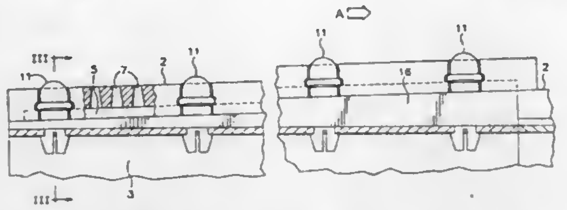
means for rotating said wires to adjust the angular orientation of said wires; and

at least one slat mounted on each of said wires,

the inside diameter of said side and divider member apertures being approximately the same as, but slightly greater than, the outside diameter of said wire and the angle of said connecting legs and the radii of said bends being such that said offset portion can be threaded through said side and divider member apertures for assembling said sieve assembly.

5,462,175
SCREEN LINING

Anton Bokor, Stutensee, Germany, assignor to Western Wire Works, Inc., Portland, Oreg.
Filed May 25, 1993, Ser. No. 67,477
Claims priority, application Germany, Feb. 10, 1993, 43 03 892.1
Int. Cl.⁶ B07B *1/49*
U.S. Cl. 209—399 **25 Claims**



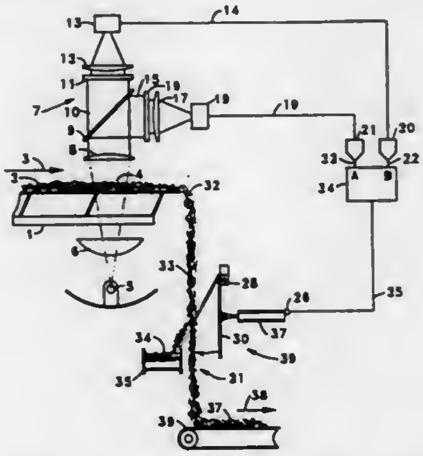
25. A lock pin assembly for readily, removably attaching said plurality of screening elements to said frame, which comprises a lock pin assembly for removably attaching said plurality of screening elements to said frame in a stair-step arrangement at different heights, each screening element being spaced apart from the other with said frame located therebetween, said lock pin assembly comprising a connector strip having first and second means for attaching the screen elements to the connector strip and in turn to the frame, said first and second attachment means being located at different heights, and means for connecting the lock pin assembly to said frame,

said lock pin assembly including means for interlockingly and removably engaging said attachment apertures to maintain the positioning of each screening element on the frame when the lock pin assembly is attached to the frame,

said lock pin assembly remaining connected within at least one mounting aperture of the frame while allowing removal of a screening element from the frame and positioning of a replacement screening element on the frame.

5,462,176
LATEX DETECTION SYSTEM

Cliff E. Hereford, deceased, late of Haddock, Ga., and Joseph H. Malek, St. Petersburg, Fla., assignors to Brown & Williamson Tobacco Corporation, Louisville, Ky.
Filed Jun. 3, 1994, Ser. No. 253,370
Int. Cl.⁶ B07C *5/00*
U.S. Cl. 209—577 **2 Claims**



1. A method of detecting and removing foreign material from a stream of particulate matter on a conveying system comprising the steps of:

transporting said particulate matter past an optical scanning area;

transmitting light through said particulate matter into a camera system;

splitting said light within said camera system into first and second beams;

filtering said first and second beams for selected wavelengths;

detecting said first and second beams to provide first and second analog signals to a computer;

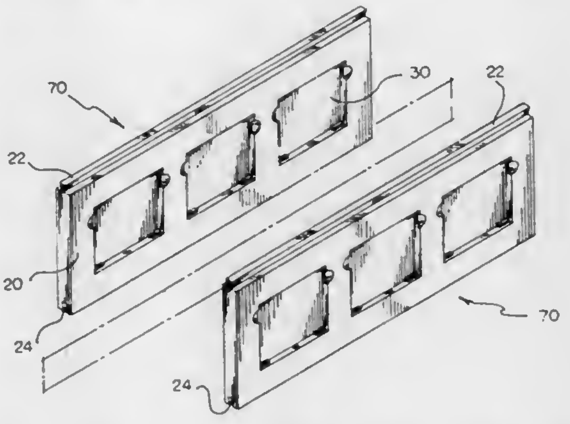
converting said first and second analog signals to first and second digital channels;

running programs to analyze said first and second digital channels to send output signals to a diverter when foreign material is detected, said programs computing a detection co-efficient to determine the occurrence of a foreign material, mapping the occurrences of foreign material and comparing the frequency and location of said occurrences of foreign material to a preselected threshold level; and,

diverting said foreign material from said stream of particulate matter in response to said output signals.

5,462,177
COMPACT DISC STORAGE AND DISPLAY RACK

Michael J. O'Donnell, 6530 W. 109th St., Worth, Ill. 60482
Filed May 11, 1994, Ser. No. 241,412
Int. Cl.⁶ A47F *7/00*
U.S. Cl. 211—40 **2 Claims**



1. A new compact disc (CD) storage and display rack for storing a collection of individually cased compact discs in a wall mountable rack which provides an attractive display of the CD case covers, protection of the CDs and CD cases from damage, easy organization of the collection, and convenient extraction/insertion of a CD from it's case without needing to remove the CD case from the rack, the compact disc storage and display rack comprising:

a rectangular rigid panel having a plurality of identical shallow straight-walled rectangular cavities formed therein, each cavity being adapted to releasably retain a conventional compact disc storage case having a top part and a bottom part hingedly connected together at the edges such that the plurality of Cases lie in a spaced coplanar relationship to each other, each cavity having gripping means whereby the CD case is gripped only by the bottom part, the top part of the case being freely pivotable about the hinge;

finger access means for providing clearance adjacent each CO case for insertion of a user's fingers to grasp the top part of the case for opening thereof, wherein the finger access means comprises first and second shallow semicircular cavities formed in the panel, each semicircular cavity being in communicating relationship with the rectangular cavity, the semicircular cavities extending outwardly from opposing long edges of the rectangular cavity proximal on end thereof, the semicircular cavities also being situated opposite each other whereby defining a pair of finger clearance slots;

mounting means whereby the panel my be attached to a room wall such that the panel lies flat against the wall with the cavities opening outwardly;

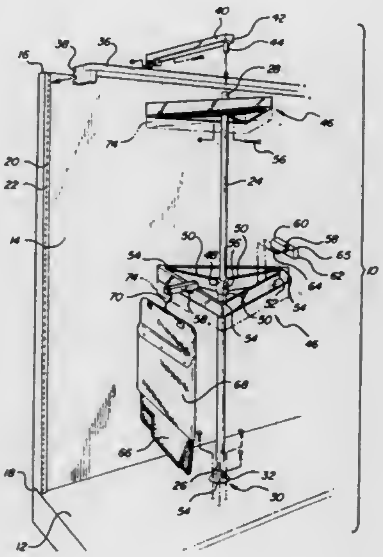
connecting means for removably connecting together a plurality of racks, the connecting means comprising a dovetail tongue formed along a top edge of the panel and a dovetail groove formed along a bottom edge of the panel whereby the tongue of one panel may slidably engage the groove of another panel such that the panels are joined coplanarly forming a single functional unit.

5,462,178
REVOLVING DISPLAY STAND

Stewart Wallach, Boca Raton, and Jacqueline Cabana, Oldsmar, both of Fla., assignors to Sagaz Industries, Inc., Miami, Fla.

Filed Jun. 13, 1994, Ser. No. 259,292
Int. Cl.⁶ A47F *5/00*

U.S. Cl. 211—95 **19 Claims**



1. An upright revolving display stand (**10**) of the type for displaying articles of merchandise (**66**) and of the type supported by both a base floor portion (**12**) and an upright wall portion (**14**) extending from the base floor portion (**12**), said revolving display stand (**10**) comprising:

a pole (**24**) having a first end (**26**) and a second end (**28**);

first rotation means (**30**) adapted to be secured to the base floor portion (**12**) for rotatably supporting said first end (**26**) of said pole (**24**);

a mounting bracket (**36**) adapted to be secured to the upright wall portion (**14**);

a cantilevered beam (**40**) extending outwardly from said mounting bracket (**36**) to a distal end (**42,42'**); said cantilevered beam (**40**) having second rotation means (**44**) at said distal end (**42**) for rotatably supporting said second end (**28**) of said pole (**24**) so that said pole (**24**) is rotatable about said first (**30**) and second (**44**) rotation means; and characterized by

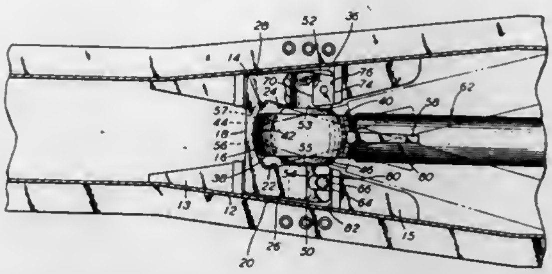
at least one display rack (**46**) including a collar (**48**) secured to said pole (**24**), three support arms (**50**) extending radially from said collar (**48**), and a triangular frame (**52**) attached to said support arms (**50**) at the apexes (**54**) thereof for supporting the articles of merchandise (**66**) to be displayed.

5,462,179
SLACKLESS DRAWBAR ASSEMBLY USING A BALL AND RACE ASSEMBLY AT EACH END OF THE DRAWBAR

David W. Daugherty, Jr., Bolingbrook; Wajih Kanjo, Lockport, both of Ill., and Michael G. Hawryszkow, Munster, Ind., assignors to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed May 4, 1994, Ser. No. 238,261
Int. Cl.⁶ B61G *9/00*

U.S. Cl. 213—62 R **34 Claims**



1. An improved slackless type drawbar assembly for connecting adjacently disposed ends of a pair of railway cars together in a substantially semi-permanent manner, said slackless drawbar assembly comprising:

(a) a first female connection member, having a first predetermined configuration, engageable in one end of a center sill portion, which is secured to a bottom portion of a car body member, of a first railway car;

(b) a first cavity formed in said first female connection member, said first cavity being defined by a back wall portion, having a second predetermined configuration, and a first pair of side wall portions, having a third predetermined configuration;

(c) a first opening, having a fourth predetermined configuration, formed through a first one of said first pair of side wall portions;

(d) an axially opposed second opening, having a fifth predetermined configuration, formed through a second one of said first pair of side wall portions;

(e) a first male connection member, having a sixth predetermined configuration, at least a portion of a first end of said first male connection member being movably disposed within said first cavity formed in said first female connection member;

(f) a first aperture formed through a predetermined portion of said first male connection member adjacent said first end thereof;

(g) a first spherical shaped member, at least a portion of said first spherical shaped member being disposed within said first aperture formed through said first end of said first male connection member;

(h) a first pair of horizontally disposed shaft members extending outwardly for a predetermined distance from axially opposed outer surfaces of said first spherical shaped member, at least a portion of a first one of said first pair of shaft members being disposed within said first opening formed through said first one of said first pair of side wall portions and at least a portion of a second one of said first pair of shaft members being disposed within said second opening formed through said second one of said first pair of side wall portions, each respective one of said first pair of shaft members has an axially opposed and substantially flat surface portion formed thereon;

(i) a first race assembly having at least a portion thereof disposed within said first aperture and secured to said first end of said first male connection member, an inner surface of said first race assembly being disposed around said portion of said first spherical shaped member disposed within said first aperture formed in said first male connection member;

(j) a second female connection member, having a seventh predetermined configuration, engageable in one end of a center sill portion, which is secured to a bottom portion of a car body member, of a second railway car;

(k) a second cavity formed in said second female connection member, said second cavity being defined by a back wall portion, having an eighth predetermined configuration, and a second pair of side wall portions, having a ninth predetermined configuration;

(l) a third opening, having a tenth predetermined configuration, formed through a first one of said second pair of side wall portions of said second cavity;

(m) an axially opposed fourth opening, having an eleventh predetermined configuration, formed through a second one of said second pair of side wall portions of said second cavity;

(n) a second male connection member having a twelfth predetermined configuration, at least a portion of a first end of said second male connection member being movably disposed within said second cavity formed in said second female connection member;

(o) a second aperture formed through a predetermined portion of said second male connection member adjacent said first end thereof;

(p) a second spherical shaped member, at least a portion of said second spherical shaped member being disposed within said second aperture formed through said first end of said second male connection member;

(q) a second pair of horizontally disposed shaft members extending outwardly for a predetermined distance from axially opposed outer surfaces of said second spherical shaped member, at least a portion of a first one of said second pair of shaft members being disposed within said third opening formed through said first one of said second pair of side wall portions and at least a portion of a second one of said second pair of shaft members being disposed within said fourth opening formed through said second one of said second pair of side wall portions, each respective one of said second pair of shaft members has an axially opposed and substantially flat surface portion formed thereon;

(r) a second race assembly having at least a portion thereof disposed within said second aperture and secured to said first end of said second male connection member, an inner surface of said second race assembly being disposed around said portion of said second spherical shaped member disposed within said second aperture formed in said second male connection member;

(s) a means engageable with a second end of said first male connection member and a second end of said second male connection member for securing said second end of said first male connection member to said second end of said second male connection member;

(t) a first pair of wedge means, a first one of said first pair of wedge means being engaged with a first one of said axially opposed and substantially flat surface portions formed on said first pair of shaft members and a second one of said first pair of wedge means being engaged with a second one of said axially opposed and substantially flat surface portions formed on said first pair of shaft members; and

(u) a second pair of wedge means, a first one of said second pair of wedge means being engaged with a first one of said axially opposed and substantially flat surface portions formed on said second pair of shaft members and a second one of said second pair of wedge means being engaged with a second one of said axially opposed and substantially flat surface portions formed on said second pair of shaft members.

5,462,180

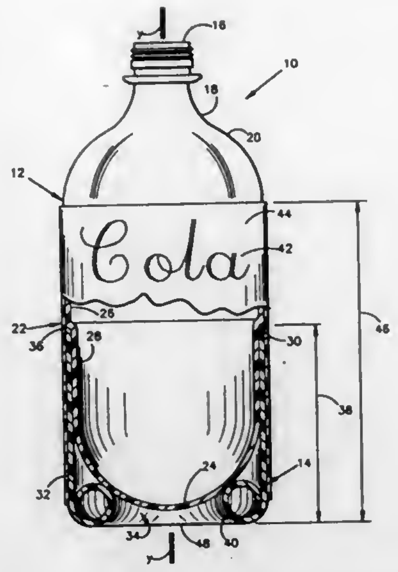
BOTTLE BASE STAND

Stephen A. Bright, Troy, Ohio, assignor to Electra Form, Inc., Vandalia, Ohio

Filed Jan. 21, 1994, Ser. No. 185,113

Int. Cl.^{6} B65D *1/02;23/08;25/24*

U.S. Cl. 215—12.1 **13 Claims**



10. A plastic container comprising an integrally molded plastic bottle comprising a shoulder, a side wall, and a substantially hemispherical bottom wall;

a base stand consisting essentially of a thin-wall unitary plastic member having an upper sheath portion engaging the bottle side wall and a toroidal base portion including a lowermost rim providing a seating rim for stable support of the bottle;

and a label enveloping the bottle and base stand, the label having a vertical dimension extending from the bottle shoulder to the toroidal base portion of the base stand.

5,462,181

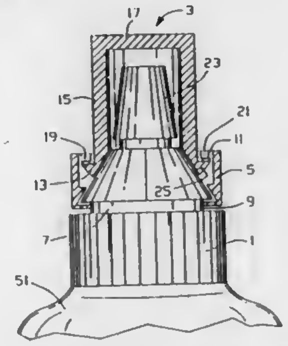
CHILD RESISTANT OVERCAP WITH SAFETY COLLAR

Kenneth P. Glynn, Raritan Township, N.J., assignor to Ideal Ideas, Inc., Flemington, N.J.

Filed Aug. 30, 1993, Ser. No. 113,236

Int. Cl.^{6} B65D *50/04;51/18;55/02*

U.S. Cl. 215—204 **14 Claims**



1. A dispenser closure, which comprises:

(a) a main closure base attachable to a container, said main closure base having a dispensing orifice, said main closure base having a top portion having a circular horizontal track thereon for attachment with an outer ring;

(b) an outer ring having a circular inside wall with a horizontal track thereon for attachment to the track of said main closure base so as to connect said outer ring to said main closure base so as to be horizontally and freely rotatable thereabout, said outer ring also having a top with an inwardly biased ledge for retaining an overcap, and having at least one cut out on said ledge to permit an overcap to be inserted and removed from said outer ring;

(c) an inner cap attached to the top of said main closure base so as to be opened and closed relative to said dispensing orifice;

(d) an overcap having a circular bottom removably inserted into said outer ring and over said inner cap, said bottom having at least one protrusion thereon which has a geometry of adequate size to freely move through said at least one cut out of said ledge of said outer ring and when said overcap is so inserted and rotated, of adequate size and geometry to prevent removal of said overcap from said outer ring, except when said at least one protrusion and said at least one cut out are in alignment; and,

Further wherein said outer ring ledge has an underside and said at least one protrusion of said overcap has a top wherein the underside of said ledge and the top side of said at least one protrusion are in frictional contact with one another when said overcap is inserted into said outer ring such that when one of said outer ring and said overcap are rotated, the other of said outer ring and said overcap rotates therewith, and wherein said frictional contact is overcome manually by holding one of said outer ring and said overcap and rotating the other of said outer ring and said overcap.

5,462,182

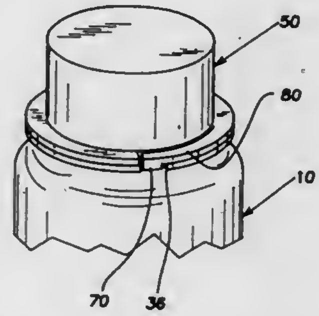
SCREWS-ON CHILD RESISTANT CONSUMER-FRIENDLY CLOSURE

Ovidiu Opresco, New York, N.Y., assignor to Weatherchem Corporation, Twinsburg, Ohio

Filed Jan. 27, 1994, Ser. No. 188,395

Int. Cl.^{6} B65D *55/02*

U.S. Cl. 215—216 **6 Claims**



1. A child resistant closure cap for a container having a threaded neck thereon, said cap having a top wall and a generally cylindrically-shaped skirt depending from a periphery of said top wall, said cap skirt having a lower edge and an internal screw thread formed for cooperation with the threaded neck of said container, locking means integrally formed with said cap skirt and adapted for being cooperatively engaged with complementary locking means of the container when said cap is fully threaded onto the container neck to prevent rotational removal of said cap, and a resilient release tab formed by a first slit in the lower edge of the cap skirt adjacent to and circumferentially extending from said locking means for a substantial arcuate distance and a second slit in the lower edge of the cap skirt perpendicularly extending from said first slit adjacent said locking means, whereby said release tab is resiliently deflectable to disengage said locking means and permit rotational removal of said cap, the lower edge of said cap skirt having a radially extending flange portion, said release tab being formed by said flange portion, said second slit extending radially outwardly through said flange portion whereby said release tab is arranged to be axially deflectable, said flange portion having an outer circumference, said release tab having a radially outwardly facing surface, whereby said outwardly facing surface of said release tab being substantially coincident with said outer circumference.

5,462,183

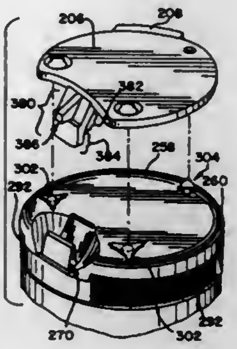
CLOSURE WITH A TAMPER-EVIDENT ELEMENT

Robert D. Rohr, Eagle; John M. Hess, Waukesha; Richard J. Daniels, Caledonia, all of Wis., and John Elliott, Waukegan, Ill., assignors to AptarGroup, Inc., Crystal Lake, Ill.

Continuation-in-part of Ser. No. 193,273, Feb. 7, 1994, abandoned. This application Dec. 9, 1994, Ser. No. 353,129

Int. Cl.^{6} B65D *17/34*

U.S. Cl. 215—237 **19 Claims**



1. A tamper-evident closure for an opening to a container interior, said closure comprising:

a molded unitary structure including
  (1) a base for attachment to said container, said base defining a discharge aperture,
  (2) a lid for movement between a closed position occluding said discharge aperture and an open position spaced from said discharge aperture, and
  (3) a manually releasable latch defined cooperatively by said base and lid to hold said lid closed; and

a tamper-indicating element that is separate from, but mounted solely to, said lid to prevent manual release of said latch, said element being free of any attachment directly to said base, said element including a removable part and including an attachment structure that is engaged with said lid and that has a frangible portion which can be broken when sufficient force is applied to remove said removable part of said element from said lid to permit operation of said latch whereby the remaining part of said attachment structure remains on said lid to provide evidence that said removable part of said element has been removed.

5,462,184

TAMPER INDICATING PACKAGE

Keith W. Ingram, Holland, Ohio, and Daniel J. Crowley, Jr., Delton, Mich., assignors to Owens-Illinois CLosure Inc., Toledo, Ohio

Continuation of Ser. No. 987,035, Dec. 7, 1992, Pat. No. 5,310,069, which is a division of Ser. No. 822,001, Jan. 16, 1992, Pat. No. 5,219,507, which is a division of Ser. No. 386,391, Jul. 27, 1989, Pat. No. 5,090,788. This application May 6, 1994, Ser. No. 239,141

The portion of the term of this patent subsequent to Feb. 25, 2009, has been disclaimed.

Int. Cl.^{6} B65D *41/34*

U.S. Cl. 215—252 **8 Claims**

1. A tamper indicating package comprising

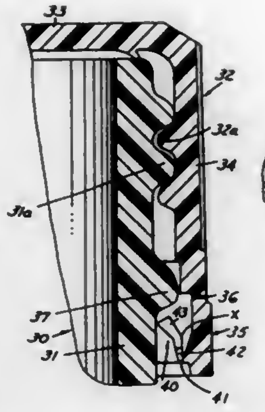
a container having a neck with a threaded finish,

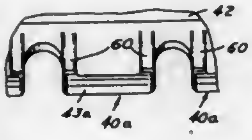
an annular bead on the neck,

a plastic closure including a base wall and a depending peripheral skirt having threads interengaging the threads of the container,

a tamper indicating band attached to the skirt by at least one weakened portion defining a line of severing, and

said band comprising a plurality of circumferentially spaced segment portions extending axially upwardly and inwardly from the remainder of the band, each said segment portion having a radially inner surface and a radially outer surface,





said segment portions including means on the radially outer surface for increasing the rigidity of each segment portion in an axial direction while permitting circumferential flexing of each segment portion so that it may tend to conform with the finish of the container.

5,462,185

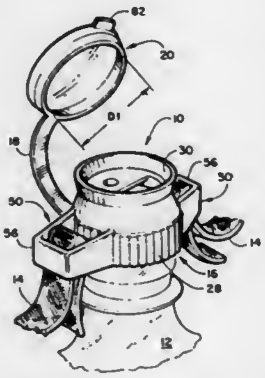
DISPENSING CLOSURE FOR FLUID CONTAINERS

Clifford M. Walker, III, 4505 Revillo Way, San Diego, Calif. 92115

Filed Jul. 18, 1994, Ser. No. 276,303

Int. Cl.⁶ B65D *51/16;25/28*

U.S. Cl. 215—307 **13 Claims**



1. A dispensing closure for a container having an externally threaded neck comprising:

a tubular cap having a top end, a bottom end, a longitudinal axis, a front side, a rear side, a left side and a right side, said tubular cap having a main body portion with a neck formed adjacent its top end; said tubular cap having a longitudinally extending bore hole that defines an inner wall surface, and said inner wall surface having internal threads formed adjacent said bottom end;

means on the interior of said bore hole for sealing the top end of the neck of a bottle once the tubular cap is threaded to the bottle;

a pair of finger-gripping arms extending transversely from diametrically opposite sides of said tubular cap; each of said finger-gripping arms having means for securing the opposite ends of a carrying strap comprising structure for interlocking said carrying strap to said finger-gripping arms; and

a closure lid for said tubular cap, and said lid having a top surface that covers said cap at the top end thereof.

5,462,186

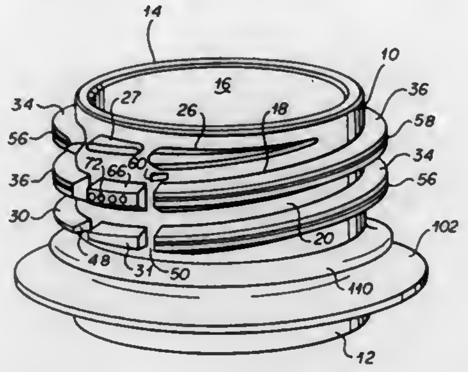
CAM FOLLOWER CLOSURE ON CONTAINER WITH CAM TRACK FINISH

Joseph M. Ladina, Marietta; Timothy R. Exley, and William A. Szedon, both of Stone Mountain, all of Ga., assignors to The Coca Cola Company, Atlanta, Ga.

Filed Aug. 2, 1994, Ser. No. 284,143

Int. Cl.⁶ B65D *41/04;55/02*

U.S. Cl. 215—330 **22 Claims**



1. In combination a closure, carbonated beverage container and finish system therefor, comprising:

a finish located on one member of a pair of members including a neck portion of a cylindrical container or an inside surface of a skirt portion of a closure and including at least two equally spaced cam tracks each spiraling around and making at least one complete revolution on a wall surface of said one member, said cam tracks being located between raised helical threads comprised of a plurality of thread segments on said one member, said at least two cam tracks further having respective equally spaced starting points on said wall surface;

plural sets of raised cam follower segments located on the other member of said pair of members for mating with said cam tracks of said one member, said cam follower segments having outwardly projecting body portions which fit into said cam tracks while contacting opposite adjacent surface portions of said threads, whereby relative rotation of the closure and finish produces an axial movement of the closure; and

pressure-actuated delay means for responsive to headspace gas pressure in the container for permitting at least one axial jog between said cam tracks and said cam follower segments during closure removal for slowing the speed of removal of the closure from the container during said relative rotation of the closure and finish.

5,462,187

PLASTIC BEVERAGE CLOSURE

James L. Gregory; Dennis J. Burzynski, both of Toledo, Ohio; Bruce J. Rote, and Frank L. Sprowl, both of Sturgis, Mich., assignors to Owens-Illinois Closure Inc., Toledo, Ohio

Continuation-in-part of Ser. No. 920,931, Jul. 28, 1992, Pat. No. 5,265,747. This application Jul. 14, 1993, Ser. No. 88,673

The portion of the term of this patent subsequent to Nov. 30, 2010, has been disclaimed.

Int. Cl.⁶ B65D *53/06*

U.S. Cl. 215—350 **12 Claims**

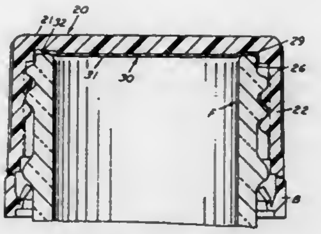
1. A plastic closure which has a finish with a top surface portion, a cylindrical outer surface portion and a curved portion at the juncture of the top surface portion and the outer surface portion, said closure comprising

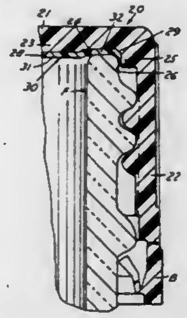
a base wall,

a peripheral skirt having an inner surface,

interengaging means on the inner surface of said skirt for engaging a container,

said interengaging means being such that relative rotational movement is required to disengage the closure from a container,





said base wall of said closure having an inner surface with a central portion and an annular liner receiving portion surrounding said central portion,

said skirt of said closure having a radially thickened portion extending radially inwardly from the inner surface of said skirt and defining a cylindrical surface extending toward the base wall,

said closure having an annular concave surface at the juncture of the base wall and said skirt and merging with said annular liner receiving portion and said cylindrical surface at the juncture of the top surface portion and the outer surface portion of the finish,

a compression molded liner engaging and being conformed to the inner surface of said central portion, said annular liner receiving portion, said concave surface and said cylindrical surface,

said liner overlying said central portion of said base wall of said closure, said annular liner receiving portion surrounding said central portion of said base wall of said closure, said concave surface of said closure and a portion of said cylindrical surface of said closure,

said liner having an exterior planar surface in the portion adapted to overlie and engage the top surface of a finish of a container, a concave arcuate surface and a free edge contacting and terminating on the cylindrical surface on said closure,

said concave arcuate surface on said liner having a configuration and cooperating with said arcuate surface on said closure such that said liner has its greatest radial thickness from a point along a central axis that is disposed horizontally below the wall of the closure in the portion of the liner between the annular liner receiving portion and the free edge of said liner,

said arcuate surface on the liner being adapted to engage the curved portion of finish at the juncture of the top surface portion and the outer surface portion of the finish and a curved portion on the exterior of the finish and terminating substantially in advance of any cylindrical outer surface portion on a container.

5,462,188

INTEGRATED INTERBOX CONNECTORS

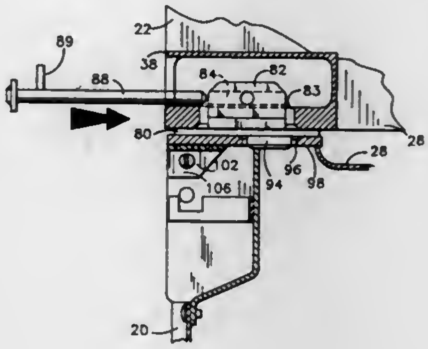
Howard J. Yurgevich, Monticello, Ind., assignor to Rosby Corporation, Monon, Ind.

Continuation-in-part of Ser. No. 49,838, Apr. 19, 1993, Pat. No. 5,346,084. This application Dec. 10, 1993, Ser. No. 165,440

The portion of the term of this patent subsequent to Sep. 13, 2011, has been disclaimed.

Int. Cl.^{6} B65D *7/26;21/02*

U.S. Cl. 220—1.5 **20 Claims**



1. Apparatus for engaging interlocking apertures provided on the bottom of cargo carriers to permit vertical stacking of the carriers, the cargo carriers also having a floor, a roof, a pair of parallel side walls, and first and second end walls respectively connected between the side walls defining a space enclosing structure, with at least one of the side walls and end walls defining an opening therethrough to permit entry and exit of cargo, the apparatus comprising

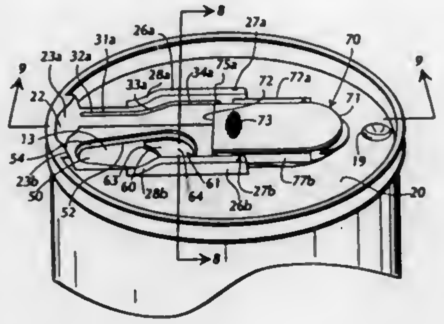
integrated interbox connectors movably connected to the carrier and positionable between in a stored position situated within the space enclosing structure of the carrier and a connecting position situated on top of the roof of the carrier, each integrated interbox connector including a rotatable projecting lug for engaging the interlocking apertures of a vertically adjacent carrier, and

securing means for securing the interbox connectors situated in the connecting position to said interlocking apertures provided on the bottom of said vertically adjacent carrier including means for rotating the rotatable head.

5,462,189
RESEALABLE, REFILLABLE CONTAINER SYSTEM

Thomas W. Pierce, 3045 New Castle Dr., Marietta, Ga. 30064
Division of Ser. No. 899,491, Jun. 16, 1992, Pat. No. 5,299,604. This application Jan. 7, 1994, Ser. No. 178,890
Int. Cl.⁶ B65D *51/18*
U.S. Cl. 220—254 **35 Claims**

9. A resealable closure apparatus for sealing a container, said



apparatus comprising:

a platform section connected to a container, said platform section defining a plug aperture, a first track, and a second track, wherein said platform section includes,

an upper surface,

a recessed floor located adjacent the plug aperture,

a first recess wall located adjacent said recessed floor and below said upper surface and defining a first section of said first track,

a first guiding head located partially above said upper surface and defining a second section of said first track,

a second recess wall located adjacent said recessed floor and below said upper surface and defining a first section of said second track, and

a second guiding head located partially above said upper surface and defining a second section of said second track; and

a plug so movably connected to said platform section that said plug selectively occupies said plug aperture, wherein said plug includes a leading end, a trailing end, a first side and an opposing second side, and a first pin member extending from a first side of said trailing end and guiding in said first track and a second pin member extending from said second side of said trailing end and guiding in said second track.

5,462,190
FUEL CAP TETHER APPARATUS

Shelly L. Lienhart, and Roger J. Rademacher, both of Holt, Mich., assignors to General Motors Corporation, Detroit, Mich.
Filed Jan. 23, 1995, Ser. No. 376,251
Int. Cl.⁶ B65D *55/16*
U.S. Cl. 220—375 **3 Claims**

1. A fuel cap tether apparatus on a motor vehicle including

a body panel having a fuel tube access opening therein,

a fuel tube having a neck behind said access opening,

a fuel door mounted on said vehicle for pivotal movement between a closed position closing said fuel tube access opening and an open position projecting outward from said body panel and exposing said fuel tube access opening, and

a fuel cap closing said fuel tube neck and removable therefrom by rotation relative to said fuel tube,

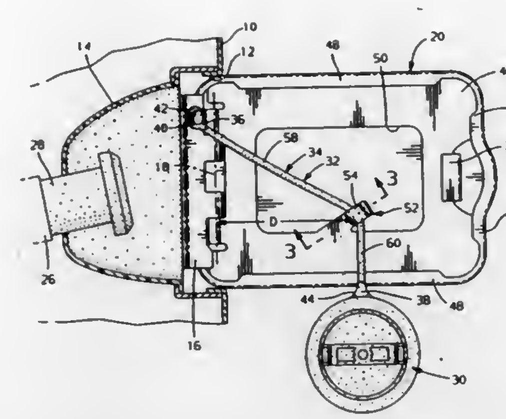
said fuel cap tether apparatus comprising:

a string-like flexible tether having a first end and a second end,

means attaching said first end of said string-like flexible tether to said vehicle,

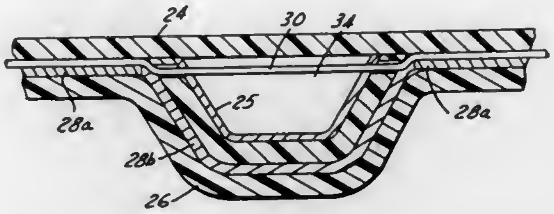
means attaching said fuel cap to said string-like flexible tether at said second end thereof so that said fuel cap is rotatable relative to said string-like flexible tether, and

a hook means on a side of said fuel door facing said fuel tube neck in said closed position of said fuel door separated from said body panel by a lateral span dimension when said fuel door is in said open position operative to releasably hang said string-like flexible tether on said fuel door when said fuel cap is removed from said fuel tube neck so that said fuel cap is laterally separated from said body panel when suspended vertically below said hook means by an outboard end of said string-like flexible tether defined between said hook means and said second end of said string-like flexible tether.



5,462,191
DOUBLE-WALLED UNDERGROUND STORAGE TANK

David H. Bartlow, and Edward B. Cannan, Jr., both of Conroe, Tex., assignors to Fluid Containment, Inc., Conroe, Tex.
Filed Feb. 7, 1994, Ser. No. 192,268
Int. Cl.⁶ B65D *90/04*
U.S. Cl. 220—469 **9 Claims**



1. An underground storage tank comprising:

a generally cylindrical inner wall comprising plastic resin and reinforcement fibers;

a plurality of circumferential support ribs bonded to the outer surface of the inner wall;

a generally cylindrical outer wall comprising plastic resin and reinforcement fibers, the outer wall substantially conforming to the contour of the inner wall and the support ribs;

at least one spacer filament mounted on the outer surface of the inner wall in the longitudinal direction over a substantial portion of the length of the tank, separating the inner wall from the outer wall and providing voids defining a passageway in which liquid flow is enhanced; and

a separator film interposed between the inner wall, spacer filament, and support ribs, and the outer wall, and covering substantially the entire outer surface of the inner wall, spacer filament, and support ribs to prevent adhesion of the outer wall to the inner wall and support ribs.

5,462,192

LUNCH HOLDER

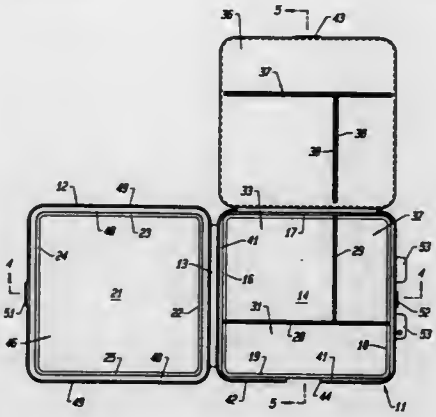
James F. Pomroy, St. Paul, and Eva M. Traxler, Minneapolis, both of Minn., assignors to Plastics, Inc., St. Paul, Minn.

Continuation of Ser. No. 168,670, Dec. 15, 1993, Pat. No. 5,323,926, which is a continuation of Ser. No. 874,902, Apr. 28, 1992, Pat. No. 5,277,329. This application Jun. 1, 1994, Ser. No. 251,894

The portion of the term of this patent subsequent to Jan. 11, 2011, has been disclaimed.

Int. Cl.^{6} B65D *1/24*

U.S. Cl. 220—526 **14 Claims**



1. In a lunch holder for holding and carrying a plurality of food products: first and second container sections of substantially similar shape and substantially equal size connected together in clamshell fashion along one side of each of said sections for movement between an open position in which the two sections are positioned side-by-side and a closed position in which the two sections are superposed one above the other, a divider separating the first section into a plurality of compartments for holding different food products, and a lid hingedly connected to the first section along a second side of said first section for movement between covering and uncovering positions relative to the compartments when the two sections are in the open position, said sections, said divider and said lid being a unitary molded structure of a semi-rigid plastic material.

5,462,193

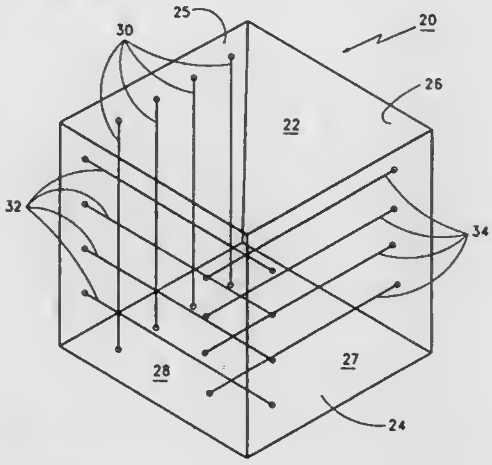
COMPOSITE PRESSURE VESSEL

Raul A. I. Schoo, Bolivar 547, Piso 6, 1066 Buenos Aires, Argentina

Filed Oct. 6, 1993, Ser. No. 132,574

Int. Cl.^{6} B65D *7/02*

U.S. Cl. 220—652 **25 Claims**



1. A composite pressure vessel for the containment generally a highly pressurized fluid, comprising:

(a) a plurality of opposed walls;

(b) a plurality of internal fibers fixedly attached to and extending between said at least two of said plurality of opposed walls interiorly of said pressure vessel, and set with a predetermined tension, so as to resist the force of said pressurized fluid tending to force said at least two of said plurality of opposed walls apart; and

(c) said plurality of internal fibers forming generally parallel sets of fibers disposed in a series of aligned rows so that the internal fibers emanate over a generally large portion of the opposed wall; and said internal fibers being offset so as not to intersect with each other, and being selected from the group comprising a single fiber strand, twisted fiber strands, and plaited fiber strand; whereby said internal fibers enable the containment of very high working pressures in said pressure vessel while minimizing the wall thicknesses of said pressure vessel thereby enabling the application of said pressure vessel in any situation where weight is a detriment.

5,462,194

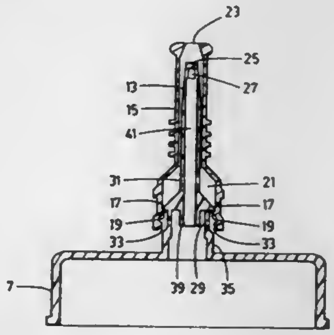
SELF-VENTING STRAW TIP

Keith D. Barnwell, Brampton, Canada, assignor to Candea Inc., Brampton, Canada

Filed Jan. 11, 1995, Ser. No. 371,100

Int. Cl.^{6} A47G *19/22;21/18;* **B65D** *47/12*

U.S. Cl. 220—709 **8 Claims**



1. A straw for a drinking container comprising:

(i) a tip having an internal channel terminating at a solid closed top and an open bottom and at least one first hole for liquid egress through the side of the tip into the channel and having at least one second hole through the side of the tip into the channel for air intake lower than the first hole;

(ii) an abutment surface of the tip around the outside of the perimeter of the tip between the first hole and the second hole;

(iii) a hollow cover movably retained on the tip and surrounding the tip having a hole at its upper end sized to fit around the solid top of the tip in sealing engagement when in a first closed position and in disengagement when in a second opened position so as to allow liquid to be removed in such second position;

(iv) a first ridge on an inner surface of the cover which is sized to sealingly engage the abutment surface between the first and the second hole when in the second open position; and

(v) a second ridge on an inner surface of the cover below the first ridge which is sized to sealingly engage the tip below the second hole when in the first closed position and which disengages from the tip when in the second open position so as to allow air into the second hole in such second position.

5,462,195
DEVICE FOR MOUNTING A HANDLE TO A PAN BODY

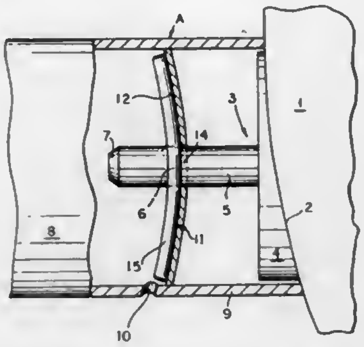
Hans-Rudolf Marti, Glarus, Switzerland, assignor to A. & J. Stockli AG, Netstal, Switzerland

Filed Aug. 29, 1994, Ser. No. 297,635

Claims priority, application Switzerland, Jan. 28, 1993, 03272/93

Int. Cl.^{6} B65D *25/28*

U.S. Cl. 220—752 **8 Claims**



1. A device for mounting a handle to a pan body, which pan body has an outer surface, including a mounting member adapted to be mounted to said outer surface of the pan body in an unreleasable manner, which handle includes a sleeve section embracing said mounting member, and including a means for mounting said handle onto said mounting member, said mounting member comprising a stub projecting towards the handle and including a transverse bore and said sleeve section comprising a curvilinear transverse wall including a concave surface area and a thereto opposite convex surface area, which transverse wall has a perforation and a transverse pin, which transverse wall is seated by its perforation in such a manner on said stub that in the mounted state of the handle its transverse wall is located adjacent the transverse bore and its pin is seated in the transverse bore and rests against the concave surface area of the curvilinear transverse wall.

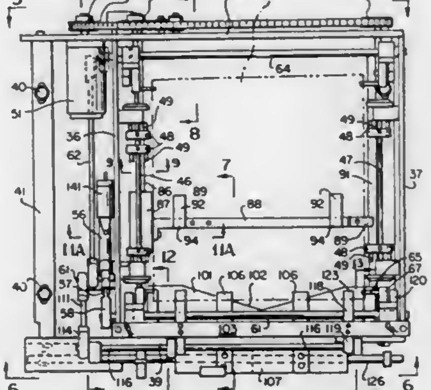
5,462,196
HOPPER AND FEED FOR PLASTIC BOOK-BINDING STRIPS

Peter Hotkowski, Old Saybrook, Conn., assignor to VeloBind, Incorporated, Northbrook, Ill.

Filed May 3, 1994, Ser. No. 237,059

Int. Cl.^{6} G07F *11/60*

U.S. Cl. 221—1 **29 Claims**



1. A hopper for an automatic book-binding machine for use with a substantially rectangular cassette having parallel horizontal longitudinal members each formed with an inward facing channel, transverse horizontal spacer members spacing said longitudinal members a fixed distance apart and vertical spacer struts spacing said cassette a fixed vertical distance below a superimposed cassette,

said cassette initially containing a plurality of thin, elongated binding strips, said strips having opposite ends each received in one said channel,

said hopper comprising:

cassette feed means for feeding a vertical stack of superimposed cassettes vertically into said hopper,

a plurality of cassette support means each having an operative position engaging under a lowermost cassette in said stack to support said cassette vertically and an inoperative position clear of said cassette to allow said cassette to drop from said hopper when said strips have been discharged therefrom, support activating means to move said cassette support means between operative and inoperative positions,

longitudinal strip feed means comprising a carriage, means guiding said carriage for movement longitudinally of said hopper below a level of said cassette, at least one upright projecting up from said carriage to engage behind a rearmost strip in said cassette, means for moving said carriage longitudinally of said hopper step by step to push the rearmost strip and all strips forward thereof forwardly a distance equal to the width of one said strip to discharge one strip at a time from said cassette,

a horizontal platen positioned to support said strips discharged from said cassette, a transverse horizontal bar adjacent the forward end of said hopper to limit forward movement of said strip, and transverse strip feed means to move said strips along said transverse horizontal bar laterally of said hopper one strip at a time.

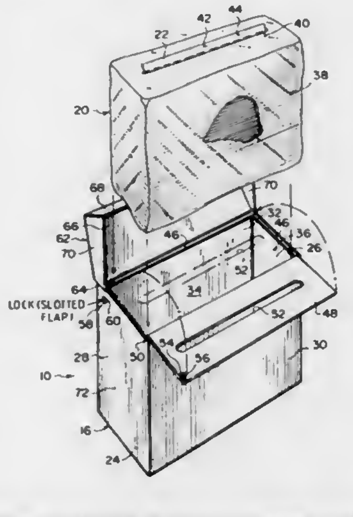
5,462,197
TOWELETTE DISPENSING DEVICE FOR CLEANING A TOILET SEAT

John D. Pound, 272 Alma Road, North Caulfield 3161, Victoria, Australia

Filed May 11, 1994, Ser. No. 241,187

Int. Cl.^{6} A47K *10/32*

U.S. Cl. 221—46 **7 Claims**



1. A towelette dispensing device for cleaning a toilet seat on a toilet bowl, which comprises:

a) a receptacle mountable onto a vertical flat surface adjacent the toilet seat, said receptacle including a bottom wall, first and second side walls, each extending upwardly from said bottom wall, a front wall extending upwardly from said bottom wall, and a rear wall extending upwardly from said bottom wall, so as to form a compartment with an open top for the insertion of a package of towelettes therein, said receptacle further including a lip formed on a top edge of said first side wall and said rear wall, and a flap hinged to a top edge of said first and second side walls adjacent said front wall, said flap having a longitudinal slot, so that when said flap is in a closed position over and onto said lip, said longitudinal slot will align with a perforated top of a soft container within said compartment of said receptacle, to allow each said towelette to be pulled out through said longitudinal slot; and

b) a package of towelettes which can be inserted into said receptacle, so that a towelette can be extracted, one at a time, from said receptacle by a person to wipe clean the toilet seat used by another person previously, which will satisfy a concern and need for individual personal hygiene by lessening the danger of germs being transmitted from the toilet seat, said package of towelettes including said soft container having said perforated top, to allow a plurality of said towelettes to be stacked within said soft container, so that once said perforated top is split open, each said towelette can be pulled out, one at a time, for use, said towelettes being fabricated out of a paper material and moistened with a disinfectant solution, so that each said towelette can clean and disinfect the toilet seat.

5,462,198

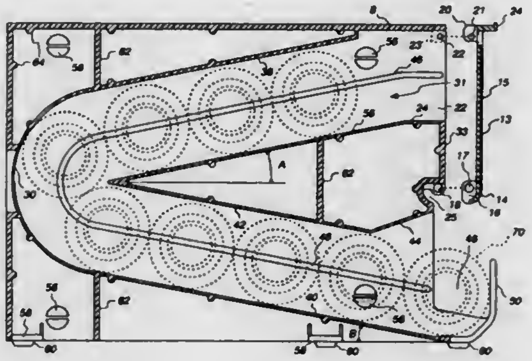
MODULAR BOTTLE DISPENSER

Alan F. Schwimmer, Northbrook, Ill., assignor to Miles Inc., Elkhart, Ind.

Filed Mar. 23, 1994, Ser. No. 217,485

Int. Cl.^{6} B65H ***3/44***

U.S. Cl. 221—130 **8 Claims**



1. A modular bottle dispenser apparatus for storing, displaying and dispensing bottles comprising:

a. a housing which includes a first opening for receiving bottles and a second opening for dispensing said bottles, said housing further including side walls, each said side wall including a friction reducing member, each said side wall further including members for interlocking adjacent modular bottle dispenser apparatuses; and

b. a continuous guide channel of two guide surfaces extending between said first opening and said second opening, said two guide surfaces defined by an upper inclined ramp and a lower inclined ramp, said upper inclined ramp being adjacent said first opening, a portion of said upper inclined ramp adjacent said first opening being horizontal, wherein the two guide surfaces are parallel over a substantial portion of the guide channel and the distance between the two guide surfaces is substantially constant over the length of the continuous guide channel, said continuous guide channel further defined as providing a path with an incline between about 9 degrees and about 11 degrees, in which said bottles travel from said first opening to said second opening.

5,462,199

APPARATUS FOR DISCHARGING PASTY COMPRESSIBLE SUBSTANCES OF HIGH VISCOSITY

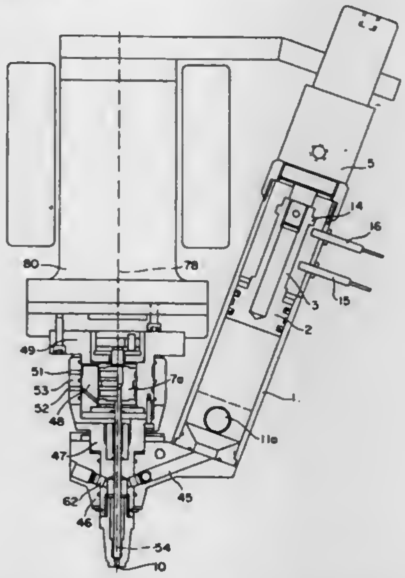
Karl Lenhardt, Neuhausen-Hamberg, Germany, assignor to Lenhardt Maschinenbau GmbH, Neuhausen-Hamberg, Germany

Continuation of Ser. No. 634,168, Dec. 17, 1990, abandoned. This application Dec. 30, 1993, Ser. No. 177,199

Claims priority, application Germany, Apr. 20, 1988, 38 13 161.7; May 7, 1988, 38 15 618.0

Int. Cl.^{6} B05C ***5/02;*** **B67D** ***5/14***

U.S. Cl. 222—54 **17 Claims**



1. An apparatus for delivering a pasty compressible substance of high viscosity, particularly for applying sealants and adhesives to automobile body parts in the manufacture of automobile bodies, the apparatus comprising:

a supply container (13) for holding the substance,
a nozzle (10) having a mouth for discharging the substance,
a feed line (11, 45) leading from the supply container (13) to the nozzle
a pump (12) for feeding the substance into the feed line (11, 45),
a holder for holding the nozzle,
a buffer container (1) disposed on the holder (46) close to the mouth of the nozzle (10) in fluid flow connection to the feedline, and having a variable volume,
a pressure generator (2 to 5), which is disposed directly on or in the buffer container (1) and is provided in addition to the pump (12), said pressure generator acting upon the buffer container to vary the volume thereof,
a flow path (45, 64, 10) between the pressure generator (2 to 5) and the nozzle mouth forming part of the feed line, and
a pressure sensor (43) which detects the pressure in the flow path (45, 64, 10) at a location which is downstream of the pressure generator (2 to 5), both the pressure sensor and the pressure generator forming part of a control loop (43, 44, 40, 25, 2 to 5) for automatically controlling pressure in the flow path at a predetermined setpoint.

5,462,200

THREADED CAP WITH CONTROLLED ORIFICE LINER FOR PIERCING A SEALED CONTAINER

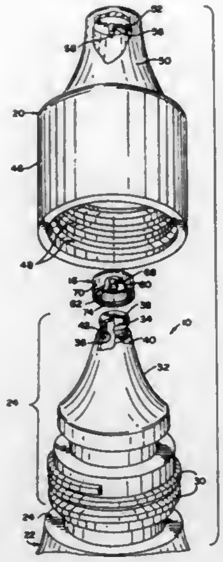
Gerhard H. Weiler, South Barrington, Ill., assignor to Automatic Liquid Packaging, Inc., Woodstock, Ill.

Filed Jan. 21, 1994, Ser. No. 184,660

Int. Cl.^{6} B67D ***5/00***

U.S. Cl. 222—83 **16 Claims**

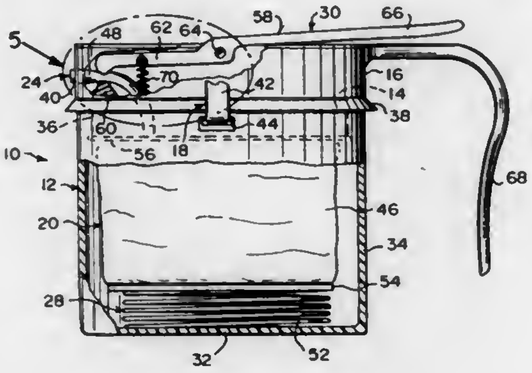
1. A dispensing orifice assembly providing a dispensing orifice of a predetermined size for a container having an access port



thereto defined by a boss and sealed by a pierceable membrane, which assembly comprises:

- a hollow overcap mountable on said boss; and
- a metamorphic flanged spike in said overcap and juxtaposed substantially normal to said pierceable membrane when the overcap is mounted to said container and transferable to said container upon full penetration of said membrane, said spike defining therein an open central passageway for container access substantially along the longitudinal axis of the spike when retained on said container.

5,462,201
AUTOMATIC LIQUID DISPENSING DEVICE
Samuel L. Wilkins, P.O. Box 108, Eastland, Tex. 76448
Filed Oct. 11, 1994, Ser. No. 320,667
Int. Cl.⁶ B65D *35/28*
U.S. Cl. 222—95 **8 Claims**



1. An automatic dispensing device comprising:

a) a housing having an open top, said housing being cylindrical shaped having bottom wall and an upstanding hollow body;

b) a lid to fit over said open top of said housing, said lid being cylindrical shaped having a downwardly extending collar to fit into said open top of said housing, a flared out lip to sit upon said hollow body and a side aperture for exiting said hose;

c) means for retaining said lid to said housing;

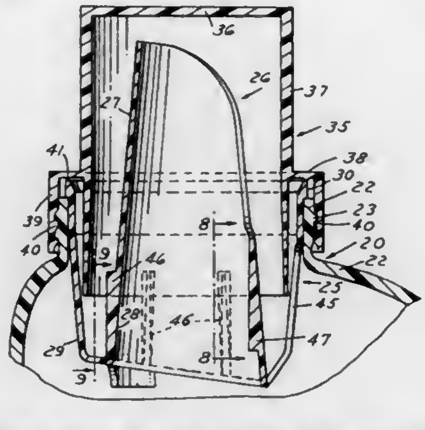
d) a bag with a liquid food product therein;

e) a hose on the top of said bag having a sealed end extending through one side of said lid;

f) means within said housing for compressing said bag placed therein; and

g) means within said lid for releasing the liquid food product through said hose after said sealed end is removed from said hose.

5,462,202
LIQUID CONTAINING AND DISPENSING PACKAGE
Eugene F. Haffner, Maumee, and Luz Rios, Oak Harbor, both of Ohio, assignors to Owens-Illinois Closure Inc., Toledo, Ohio
Filed Aug. 25, 1994, Ser. No. 295,964
Int. Cl.⁶ B67D *1/16*
U.S. Cl. 222—109 **6 Claims**

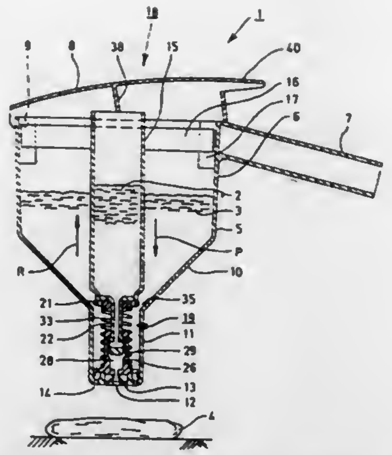


1. A liquid dispensing fitment for use on a container having a neck comprising

- a plastic body,
- said body having an inner wall defining an axial spout extending from within the neck of a container and axially beyond the end of the neck,
- said body having an outer annular wall spaced from said spout and connected to said spout by an integral annular connecting portion,
- said spout extending axially beyond said outer wall,
- said spout having an upper generally C-shaped cross section defining an opening and a lower annular cross section,
- said annular connecting portion being inclined with respect to the axis of the spout and having its lowermost portion aligned with the said opening of said C-shaped portion of said spout,
- said outer wall having an axial opening extending from a position aligned with the juncture of the C-shaped portion and annular portion of the spout through said annular connecting portion to define a combined drain back opening and a near empty pour out hole, and
- integral means on said upper end of said outer wall for engaging the neck of a container, said lower portion of said spout being substantially smooth in an axial direction to facilitate drain back,
- said lower portion of said spout having an inner surface formed with an integral axial rib having an unsymmetrical cross section aligned with said axial opening in said outer wall to facilitate manufacture.

5,462,203
DISPENSER FOR DISPERSING CONVENIENT UNITS OF TWO LIQUID PRODUCTS
Leif E. Stern, Lomma, Sweden, assignor to Asept International AB, Lund, Sweden
Filed Feb. 7, 1994, Ser. No. 192,850
Claims priority, application Sweden, Feb. 11, 1993, 9300447
Int. Cl.⁶ B67D *5/52*
U.S. Cl. 222—137 **13 Claims**

1. A dispenser for dispensing convenient units of two liquid products, said dispenser comprising: a first container (5) for hold-



ing one liquid product (3) and a second container (15) arranged within the first container (5) for holding the other liquid product (2); wherein a piston assembly (19) in a pump assembly (18) being movably mounted-in the first container (5) providing a feed-out movement (P) for feeding convenient units of the two liquid products (2, 3) simultaneously out of the first and the second containers (5, 15); wherein the piston assembly effects the feed-out movements (P) by being urged towards at least one return means (33) for feeding out convenient units of the liquid products (2, 3) through discharge openings (13, 14) in the dispenser (1) and the piston assembly (19) comprising:

at least one outer sealing means (21) under tight application against the first container (5) forcing the liquid product (3) collected in an outer dispensing chamber (31) in the first Container (5) through at least one of said discharge openings (14); and at least one inner piston (22) under tight application against a wall of a valve housing (26) forcing liquid product (2) collected in a feed-out chamber (28) in the valve housing (26) through at least one of said discharge openings (13); wherein the at least one outer sealing means (21) of the piston assembly (19) during a return movement (R) of the piston assembly (19) in a direction opposite to its feed-out movement (P) admits units of liquid product (3) to the dispensing chamber (31) of the first container (5) and wherein one of the at least one inner piston (22) and the valve housing (26) during said return movement (R) admits units of liquid product (2) to the feed-out chamber (28) in the valve housing (26).

5,462,204

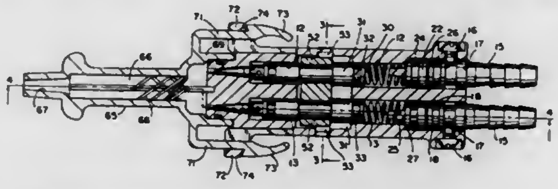
FOAM DISPENSING GUN

Clifford J. Finn, Milwaukee, Wis., assignor to RHH Foam Systems, Inc., Cudahy, Wis.

Filed Mar. 29, 1994, Ser. No. 219,151

Int. Cl.^{6} B67D *5/52*

U.S. Cl. 222—137 **26 Claims**



1. A foam dispensing gun, comprising:

a body having a pair of longitudinal passageways each including an inlet at one end adapted to be connected to a source of a pressurized fluid component, each passageway also including a conical valve seat at the other end of the passageway that opens to a nose at the end of the body;

a nozzle connected to the body and surrounding the nose, the nozzle including an outlet and a mixing chamber disposed between the nose and the outlet;

a valve member disposed in each passageway, each valve member having a forward needle portion with a conical outer surface that mates with the like surface of a respective valve seat and a rearward portion that seals off the respective passageway, each valve member also having an internal passage in fluid communication with the inlet of its respective passageway and terminating in a port short of the needle portion;

a spring connected to urge each valve member to a closed position in which the needle portion seats against the respective valve seat; and

a manually operable trigger to move the valve members to an open position against the urging of the springs.

5,462,205

PLUGGABLE MULTIPLE CARTRIDGE

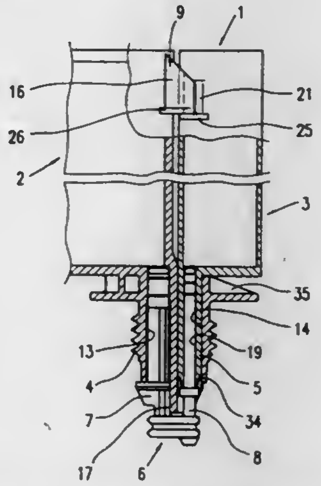
Wilhelm A. Keller, Obstgartenweg 9, CH-6402 Merlischachen, Switzerland

Filed Mar. 14, 1994, Ser. No. 209,740

Claims priority, application European Pat. Off., Mar. 15, 1993, 93810188

Int. Cl.^{6} B67D *5/60*

U.S. Cl. 222—145.1 **8 Claims**



1. A pluggable multiple cartridge comprising at least two storage containers, each storage container having at least two ends with an outlet at one end, the other end of said storage containers being attachable together by fixing means, wherein a common outlet tube socket is provided on one storage container, said common outlet tube socket having a socket channel for said outlet of said one storage container, the remaining storage containers each having at said outlet a dispensing channel pluggable into the common outlet tube socket, said common outlet socket having a separately disposed socket channel for receiving the dispensing channels of the remaining storage containers, and wherein said storage containers are positioned in a side-by-side arrangement.

5,462,206

MELTING ASSEMBLY FOR THERMOPLASTIC MATERIALS

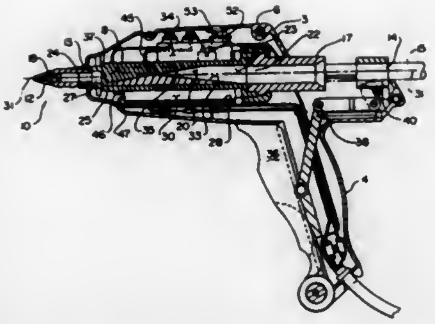
Jon B. Kwasie, 6 Highwood Rd., Manchester, Mass. 01944

Filed Oct. 12, 1994, Ser. No. 322,003

Int. Cl.^{6} B07D *5/62*

U.S. Cl. 222—146.5 **16 Claims**

1. In an apparatus for melting and dispensing thermoplastic material comprising a thermally conductive melting chamber having inlet and outlet means, by means of which the material can be passed through the chamber to melt and dispense same, the chamber having associated therewith means for heating the chamber and



temperature control means for controlling the temperature of the chamber, the improvement comprising: a plurality of fixed, heat-conducting blades, the blades being spaced from one another, substantially parallel with respect to each other and protruding into the chamber from a side wall thereof, the blades further being situated in the chamber longitudinally thereof whereby the blades progressively slice and melt the thermoplastic material as it moves through the chamber from the inlet means to the outlet means.

5,462,207

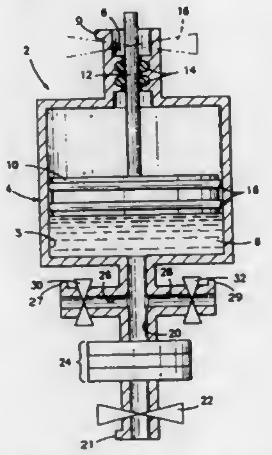
ENVIRONMENTALLY SAFE DISPENSING ASSEMBLY FOR ULTRA-PURE LIQUID CHEMICALS

Ivan S. Daraktchiev, Leuven, Belgium, assignor to OCG Microelectronic Materials, Inc., West Paterson, N.J.

Filed Oct. 19, 1994, Ser. No. 325,020

Int. Cl.⁶ B65B *3/04*

U.S. Cl. 222—148 **3 Claims**



2. A reusable dispensing assembly for supplying an ultra high purity liquid chemical to a production line, said assembly comprising:

a) a reservoir for containing a supply of the chemical;
b) means for applying dispensing pressure to the chemical in said reservoir;
c) an outlet passage leading from said reservoir, said outlet passage providing an outlet for chemical dispensed from said reservoir;
d) a chemical refill passage communicating with said reservoir;
e) a reservoir rinse passage communicating with said reservoir, said rinse passage being separate from said refill passage;
f) a first valve in said refill passage;
g) second valve in said rinse passage, said first valve being operable to close said refill passage against flow of chemical into said reservoir when said second valve is opened to admit a chemical-rinsing medium into said reservoir via said rinse passage; and
h) a third valve in said outlet passage, said third valve being operable to close when said first valve is opened to refill said reservoir with fresh chemical, and said third valve further being operable to open when said second valve is opened to admit said rinsing medium into said reservoir, whereby said outlet passage provides a conduit for flushing the rinsing medium from said reservoir.

5,462,208

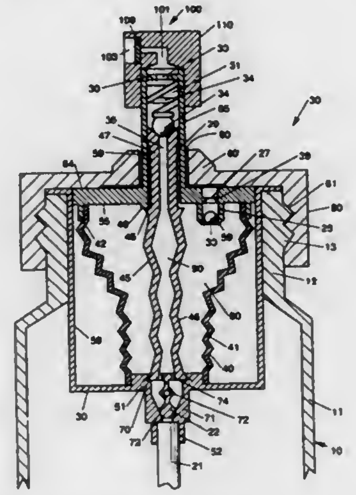
TWO-PHASE DISPENSING SYSTEMS UTILIZING BELLOWS PUMPS

Robert E. Stahley, Middletown; Mark T. Lund, West Chester, and Dimitris I. Collias, Cincinnati, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Aug. 1, 1994, Ser. No. 283,885

Int. Cl.⁶ B65D *37/00*

U.S. Cl. 222—207 **19 Claims**



1. A manually-actuated pump for dispensing a liquid in combination with a gas, said pump comprising:

(a) a liquid chamber having a volume which is reduced upon actuation of said pump to dispense said liquid; and
(b) a gas chamber enclosed by a gas bellows having a non-uniform cross-sectional area, said gas bellows being collapsible in response to actuation of said pump to dispense said gas in combination with said liquid at a pre-determined gas/liquid ratio, said pre-determined gas/liquid ratio being maintained substantially constant throughout the course of actuation of said pump by said non-uniform cross-sectional area of said gas bellows.

5,462,209

TRIGGER SPRAYER OPERABLE IN UPRIGHT, DOWNTURNED AND INVERTED POSITIONS

Donald D. Foster, St. Charles, and Philip L. Nelson, Ellisville, both of Mo., assignors to Contico International, Inc., St. Louis, Mo.

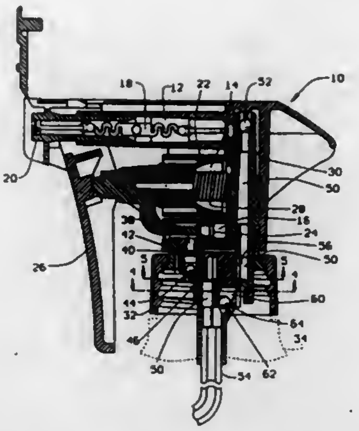
Continuation-in-part of Ser. No. 242,281, May 13, 1994. This application Jul. 12, 1994, Ser. No. 273,951

Int. Cl.⁶ B67D *5/42*

U.S. Cl. 222—376 **23 Claims**

1. A trigger sprayer for dispensing liquid from a container in an upright orientation, a downturned orientation and an inverted orientation of the trigger sprayer, the trigger sprayer comprising:

a dispenser head for dispensing liquid from the container to which the dispenser head is adapted to be attached, the dispenser head having a vent passage providing venting communication of an interior of the container with an exterior environment of the dispenser head through the vent passage when the dispenser head is positioned in the upright orientation, and the dispenser head having means for blocking communication of the interior of the container with the exterior



environment of the dispenser head through the vent passage both when the dispenser head is positioned in the downturned orientation and when the dispenser head is positioned in the inverted orientation while the trigger sprayer is dispensing liquid.

5,462,210

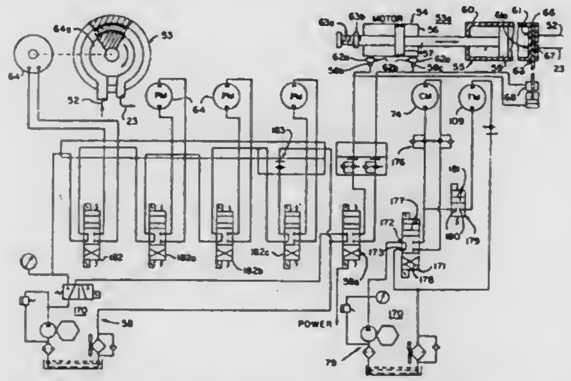
LIQUIFIED FOOD PRODUCT PUMP SYSTEM FOR SUPPLYING OF LIQUIFIED SAUCES AND OTHER PRODUCTS IN PREDETERMINED QUANTITIES

Harvey G. Kuhlman, N56 W21466 Silver Spring Rd., Menomonee Falls, Wis. 53046

Division of Ser. No. 117,225, Sep. 3, 1993, Pat. No. 5,365,831, which is a division of Ser. No. 714,824, Jun. 13, 1991, Pat. No. 5,241,899. This application Nov. 21, 1994, Ser. No. 342,918

Int. Cl.^{6} B67D *5/40*

U.S. Cl. 222—380 **6 Claims**



4. A pump apparatus for delivery of a liquified food product including a liquified food product and having chunky materials therein, comprising a piston-cylinder unit including a cylinder having an inlet/outlet end, a valve unit secured to said inlet/outlet end, said valve unit including a body member secured to said end in a fluid-tight connection, said body having an inlet opening and a discharge opening diametrically spaced, a valve plate slidably mounted within said valve body in fluid tight sliding engagement therein, said valve plate having a single opening adapted to be aligned with said inlet opening and alternatively with said outlet opening, said valve body closing the opening not aligned with said single opening, said piston-cylinder unit having a piston member slidably mounted therein and creating a suction force during movement away from said inlet/outlet end and a pressure within said cylinder for intake and discharge of said product, a pump motor unit coupled to said piston-member for cyclically operating the piston member, a valve plate motor unit for sliding of said valve plate between said inlet opening and said discharge opening, and a control unit connected to said motor units for operating of said valve unit in synchronism with the movement of said piston-member to align said single opening with said inlet opening during the retraction of said piston member for drawing of said sauce product into said cylinder and for alternately aligning said single opening with said discharge opening in synchronism with the movement of said piston member toward said discharge end, said openings being constructed to positively sever any chunky material within the respective single opening upon movement of the single opening through said respective inlet opening and discharge opening and thereby establish positive controlled movement of the food product into and from said cylinder unit in precise controlled amounts.

5,462,211

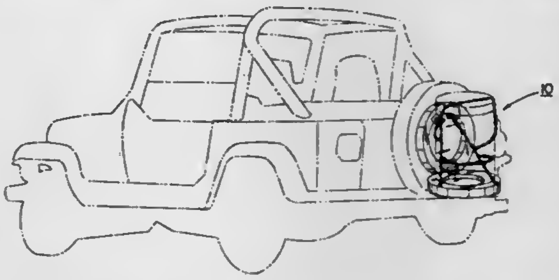
SPARE TIRE MOUNTED CONTAINER CARRIER

Earl K. Eversoll, 325 S. Wickiup, Apache Junction, Ariz. 85219

Filed Feb. 23, 1995, Ser. No. 393,437

Int. Cl.^{6} B62D *43/00*

U.S. Cl. 224—42.14 **4 Claims**



1. A new and improved carrier adapted to be secured to an inner portion of a spare automotive tire having an inside diameter and an outside diameter, the carrier comprising, in combination;

a backing disk having an upper extent, a lower extent, a first side, a second side and a periphery therebetween, the backing disk having a diameter approximately equal to the inside diameter of said automotive tire, two mounting holes formed through the upper extent of the backing disk, two bolts adapted to be inserted through the mounting holes to secure the backing disk to the inner portion of a spare automotive tire, two primary chain hooks secured within the upper extent of the backing disk, two secondary chain hooks secured within the backing disk;

a backing ring having an upper extent, a lower extent, a first side, a second side and a periphery therebetween, the ring having an outside diameter approximately equal to the diameter of the backing disk, and an inside diameter, the first side of the backing ring secured to the second side of the backing disk;

a base disk having an upper extent, a lower extent, a first side, a second side and a periphery therebetween, the base disk having a diameter approximately equal to the inside diameter of said automotive tire, indicia formed upon the second side of the base disk;

a base ring having an upper extent, a lower extent, a first side, a second side and a periphery therebetween, the ring having an outside diameter approximately equal to the diameter of the base disk, and an inside diameter, the second side of the base ring secured to the first side of the base disk, two primary chain hooks secured to the upper extent of the base ring,

a hinge having a first mounting plate pivotally secured to a second mounting plate, the first mounting plate secured to the lower extent of the backing ring, the second mounting plate secured to the lower extent of the base ring, the hinge thus pivotally relating the backing disk and backing ring to the base disk and base ring;

two primary chains secured between the two primary chain hooks of the backing disk and the two primary chain hooks of the base ring, the two primary chains being of a length to allow the base disk and base ring to pivot 90 degrees relative to the backing disk and backing ring; and two secondary chains secured between the two secondary chain hooks of the backing disk, the secondary chains serving to secure a container to the first side of the base disk and the first side of the base ring when the base disk and base ring are pivoted 90 degrees relative to the backing disk and backing ring.

5,462,212

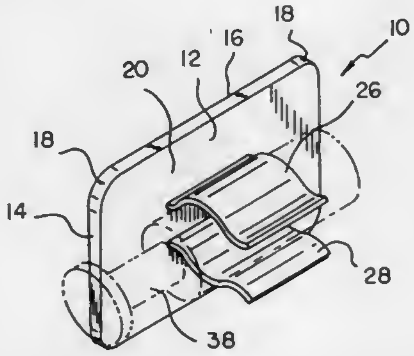
CIGARETTE LIGHTER KEEPER

Robert N. Hertel, Jr., 3000 Valley Forge Cir., Apt. 1347, King of Prussia, Pa. 19406

Filed Jul. 18, 1994, Ser. No. 276,836

Int. Cl.⁶ B60R *7/00*

U.S. Cl. 224—570 **1 Claim**



1. A new and improved cigarette lighter and keeper for holding a cigarette lighter comprising, in combination:

a cylindrical cigarette lighter;

a one-piece base plate formed of a rigid material in a rectangular configuration having rounded corners and having short parallel side edges with a vertical center line therebetween and long parallel upper and lower edges with a horizontal center line therebetween, the one-piece base plate having a front face and a rear face parallel with respect to each other;

two forwardly extending brackets integrally formed with the front face of the base plate, the brackets being positioned on a central extent of the front face and extending to between about 30 and 50 percent of the length of the base plate on opposite sides of the horizontal center line, respectively, each of the brackets extending outboardly from the base plate essentially perpendicular to the front face at the inboard extents of each of the brackets and then arcuately curved away from the horizontal center line and then formed with an opposite curve at the outboard extents of each of the brackets, intermediate extents of each of the brackets together constituting the greater portion of a circular cross-section receiving and supporting the cigarette lighter therein, the brackets being fabricated of a resilient material to allow the positioning and removal of the cigarette lighter within the intermediate extents of the brackets, the brackets being spaced along their entire extents when the cigarette lighter is removed therefrom and when supported thereby;

an adhesive layer formed on the rear face of the base plate to allow securement thereof to any of a plurality of surfaces within an automobile; and

a flexible sheet of peelable material secured over the adhesive layer on the rear face of the base plate to preclude sticking of the base plate onto one of said surfaces until the peelable material is removed.

5,462,213

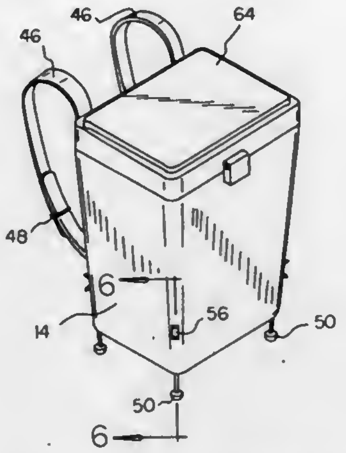
COMBINATION SEATS AND STORAGE CONTAINERS WITH CARRYING STRAPS

Robert W. Watt, 2703 Bockstruck La., Alton, Ill. 62002

Filed Mar. 2, 1994, Ser. No. 204,957

Int. Cl.⁶ A45F *4/02*

U.S. Cl. 224—155 **6 Claims**



1. A new and improved combination seat and storage container with carrying straps comprising, in combination:

a storage container having trapezoidal shaped side walls and front and rear trapezoidal shaped walls forming a generally rectangular but downwardly tapering configuration, the storage container having a rectangular bottom wall having corners secured at its periphery thereof to lower edges of the side, front and rear walls and a generally rectangular lid larger than the bottom wall having a rear edge pivotally secured along an upper edge of the rear wall and with a clasp securing a front edge of the lid to the front wall of the container;

a pair of shoulder straps secured to the rear wall for transportation purposes;

the side, front and rear walls being fabricated of a double wall configuration with an accordion structure located therein for added strength;

a padded seat fixed to an upper surface of the lid for more comfortable seating by a user;

a sealed projection on a lower surface of the lid around its periphery thereof with a cooperable recess formed in the upper edge of the rear wall and an upper edge of the front and side walls;

each of said corners of said bottom wall having a substantially vertically extending bore, each of said bores extending within an associated wall of said walls of said storage container substantially along the length and intermediate said double wall configuration of the associated wall;

a plurality of leveling legs having a length substantially equivalent to said bores, each of said legs being mounted within one of said bores for extension therefrom or retraction therein, each of said legs having an associated pinch clamp to control the extension and retraction of said leg with respect to said bore; and

a liquid container for liquid located within the storage container and a tube coupling the bottom of the liquid container with the exterior of the storage container for drinking purposes.

5,462,214

BODY MOUNTED CAMERA SUPPORT ASSEMBLY

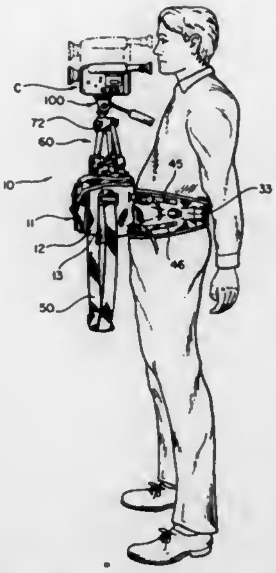
Brian Buswell, Rte. 1, Box 2440, Show Low, Ariz. 85901

Filed Apr. 14, 1994, Ser. No. 227,338

Int. Cl.⁶ G03B *29/00*

U.S. Cl. 224—224 **22 Claims**

1. An apparatus for supporting a camera in a stable position from an individual's torso, comprising, a storage case having an inner



storage compartment which is defined by upper and lower walls, opposite side walls and front and rear walls, belt means extending from said storage case for mounting the storage case to the individual's torso, a plurality of first locking elements mounted in spaced relationship to one another to said storage case, a stand having at least two adjustable legs, each of said legs having upper and lower ends, a camera engaging means mounted to said stand and extending above said upper end of said legs, second locking elements mounted to said lower end of said legs, and said first and second locking elements being releasably engageable with one another to thereby mount said stand to said storage case.

5,462,215

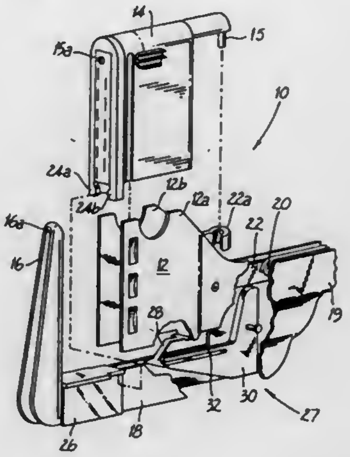
LOCKING DEVICE FOR AN APPARATUS FOR APPLYING SURGICAL FASTENERS

Frank J. Viola, Sandy Hook; David T. Green, Westport, and Henry Bolanos, East Norwalk, all of Conn., assignors to United States Surgical Corporation, Norwalk, Conn.

Continuation of Ser. No. 275,227, Jul. 14, 1994, abandoned, which is a continuation of Ser. No. 71,935, Jun. 3, 1993, abandoned, which is a continuation of Ser. No. 780,861, Oct. 18, 1991, abandoned. This application Dec. 9, 1994, Ser. No. 352,976

Int. Cl.^{6} A61B *17/068*

U.S. Cl. 227—176 **29 Claims**



1. A locking device for a surgical fastener applying instrument, said instrument including a first jaw member having a cartridge containing a plurality of fasteners and a second jaw member, advancing means for approximating said first jaw member towards said second jaw member to grip tissue therebetween, and means for driving said fasteners from said cartridge into said tissue, said locking device comprising:

means for engaging said first jaw member, said engaging means positioned on said second jaw member and movable from a non-engaged position prior to said fasteners being driven from said cartridge to an engaged position subsequent to said fasteners having been driven from said cartridge, said engaging means including a cantilivered blocking portion for permitting proximal movement of said first jaw member subsequent to said fasteners having been driven from said cartridge and impeding distal movement of said first jaw member after said fasteners have been driven from said cartridge, said engaging means movable to said engaged position only after said fasteners have been driven from said cartridge.

5,462,216

PROCESS FOR BRAZING METAL, AND APPARATUS THEREFOR

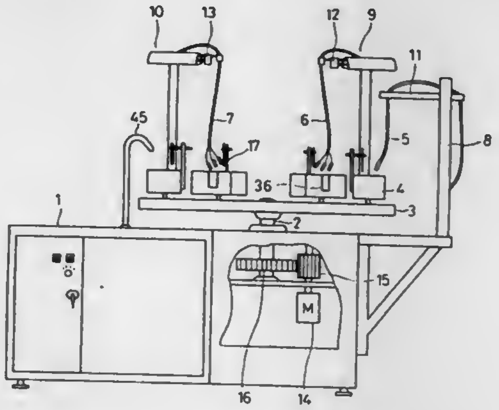
Makoto Nishimura, No. 1-28-5, Toyotama-Naka, Nerima-Ku, Tokyo, Japan

Division of Ser. No. 150,353, Nov. 9, 1993. This application Oct. 7, 1994, Ser. No. 320,094

Claims priority, application Japan, Nov. 10, 1992, 4-323747

Int. Cl.^{6} B23K *3/00;3/04*

U.S. Cl. 228—47.1 **4 Claims**



1. An apparatus for brazing a metal, comprising

a transfer means for intermittently transferring a work along a production line,

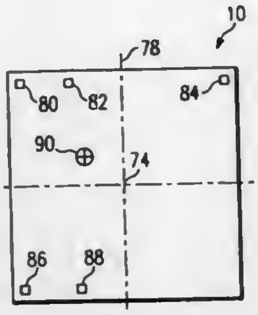
a plurality of box-like heat retaining containers mounted at constant distances on said transfer means and opened at its upper portion to surround lower and side surfaces of the work,

a retaining jig provided for each of said heat retaining containers for fixing the work, at least one work-preheating gas burner disposed along said production line and constructed so that a continuous combustion and a pulse combustion are switched-over from one to another, and

at least one regular brazing gas burner disposed along the production line downstream from said work-preheating gas burner and constructed so that a continuous combustion and a pulse combustion are switched-over from one to another.

5,462,217
HIGH FORCE COMPRESSION FLIP CHIP BONDING SYSTEM

Richard L. Simmons, Jonestown, and Michael J. Bertram, Dripping Springs, both of Tex., assignors to Microelectronics and Computer Technology Corporation, Austin, Tex.
Division of Ser. No. 112,494, Aug. 25, 1993, Pat. No. 5,368,217. This application Sep. 15, 1994, Ser. No. 306,548
Int. Cl.⁶ B23K *20/02;* **H01L** *21/603*
U.S. Cl. 228—180.22 **14 Claims**



1. A method for precisely bonding interconnects of a flip chip device to a corresponding wiring pattern on a substrate, comprising the steps of:

determining the centroid of the pattern formed by the interconnects on the flip chip device;

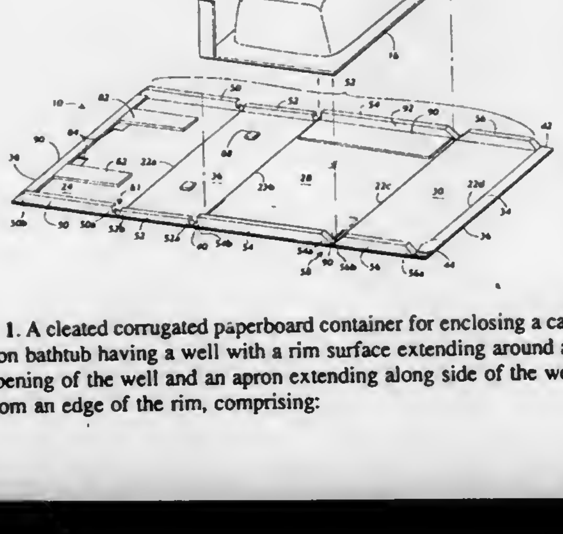
directing the flip chip device toward the substrate for contacting the corresponding wiring pattern with the interconnects;

compressing the interconnects into the corresponding wiring pattern using a bonding force, the bonding force being directed along a neutral axis of deflection of a frame transmitting the bonding forced the neutral axis of deflection being coincident with the centroid, to minimize lateral shifting of the flip chip device relative to the substrate to precisely bond the interconnects to the corresponding wiring pattern; and

electronically viewing the flip chip device and the substrate along the neutral axis of deflection for aligning the flip chip interconnects with the corresponding wiring pattern.

5,462,218
CLEATED CORRUGATED PAPERBOARD CONTAINER

John M. Grigsby, 2275 Edgemere Lake Cir., Marietta, Ga. 30062, and Daniel H. Doerr, 4794 Boxwood Way, Acworth, Ga. 30102
Filed Oct. 3, 1994, Ser. No. 317,038
Int. Cl.⁶ B65D *5/50*
U.S. Cl. 229—23 C **9 Claims**



1. A cleated corrugated paperboard container for enclosing a cast iron bathtub having a well with a rim surface extending around an opening of the well and an apron extending along side of the well from an edge of the rim, comprising:

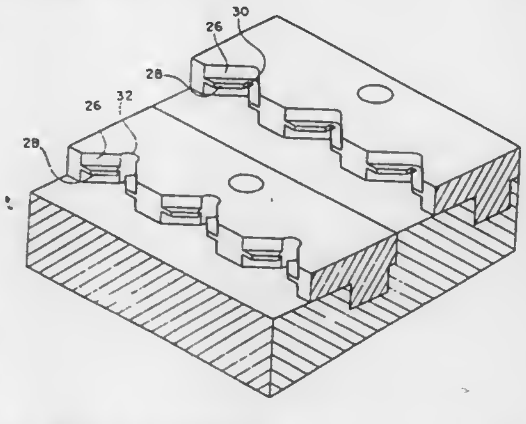
a blank of corrugated paperboard scored to define a top panel, an apron panel, a bottom panel, and a well panel as a series of panels and a manufacturers joint foldably joined together along the respective scores, the blank having two side edges, a leading edge, and a trailing edge; and

a pair of cleats rigidly attached to the side edges each of the panels in the series of panels, whereby a plurality of cleats are longitudinally aligned on the side edges of the blank, each cleat having a pair of longitudinal ends which are cut for mating engagement with the end of the adjacent cleat upon folding the blank on the scores,

whereby the blank, being folded on the scores after the bathtub is placed rim down on the bottom panel of the blank, encloses the bathtub in a corrugated paperboard container which is closed by securing the manufacturers joint to a portion of the top panel adjacent the trailing edge of the blank.

5,462,219
DEVICE FOR ASSEMBLING SEMICONDUCTOR CHIPS BETWEEN TWO HEAT SINKS

Claude Pouet, Tours, and Yoland Collumeau, Rochecorbon, both of, France, assignors to SGS-Thomson Microelectronics, S.A., Pouilly, France
Continuation of Ser. No. 82,668, Jun. 25, 1993, Pat. No. 5,351,873. This application Aug. 12, 1994, Ser. No. 289,947
Claims priority, application France, Jun. 26, 1992, 92 08282
The portion of the term of this patent subsequent to Oct. 4, 2011, has been disclaimed.
Int. Cl.⁶ B23K *37/04*
U.S. Cl. 228—49.5 **20 Claims**



19. A device, for mounting a heat sink to a chip in a predetermined configuration, the device comprising:

an inclined surface; and

a stop extending from the inclined surface, the stop being constructed and arranged to hold the chip and the heat sink against the force of gravity in the predetermined configuration, wherein the stop includes a main stop to abut the heat sink and a median stop to abut the chip.

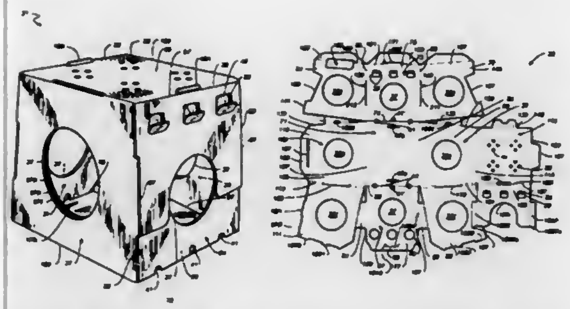
5,462,220
SHIPPING AND DISPLAY BOX

Mark R. Bacchetti; Ronald E. Heiskell, both of Tracy, and Ezra E. Theys, San Mateo, all of Calif., assignors to Advanced Container Corporation, Tracy, Calif.
Continuation of Ser. No. 191,172, Feb. 3, 1994, abandoned. This application Feb. 28, 1995, Ser. No. 395,648
Int. Cl.⁶ B65D *21/032*
U.S. Cl. 229—112 **17 Claims**

1. A stackable box, comprising:

a horizontal bottom wall provided with one or more openings;

a horizontal top wall;



a front wall and a rear wall extending between the top wall and the bottom wall; and

upwardly extending stacking tabs, at least one of the stacking tabs being disposed at each of a top front and a top rear corner of the box,

wherein the openings provided in the bottom wall correspond in number to the stacking tabs, have internal dimensions corresponding to external dimensions of the stacking tabs, and are provided in the bottom wall vertically below the stacking tabs, and a left and a right edge of the top wall are each smaller than corresponding left and right edges of the bottom wall and a front and a rear edge of the top wall are each substantially the same length as corresponding front and rear edges of the bottom wall.

5,462,221

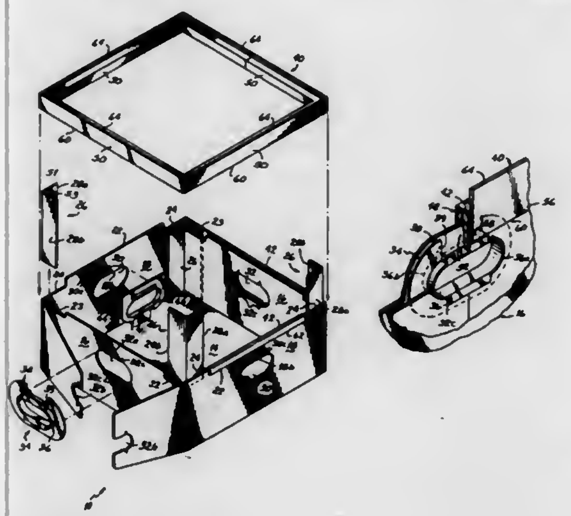
TOTE BOX HANDLE

Robert M. Zink; Donald J. Bazany, both of Grand Haven, and Douglas E. Tramper, Jenison, all of Mich., assignors to Bradford Company, Holland, Mich.

Filed Jan. 4, 1995, Ser. No. 368,559

Int. Cl.^{6} B65D *5/468; 5/42*

U.S. Cl. 229—117.16 **22 Claims**



1. A tote box comprising:

a box formed from a foldable box blank and having a bottom and upstanding walls, and said walls having upper edges which form a top edge of said box;

a unitary top rail extending around the top edge of said box, said top rail having a downwardly open channel formed between a pair of channel side walls, said channel being fitted over said top edge of said box;

a hole in selected ones of said walls; and

a handle inserted into said hole, said handle having a flange extending from said hole when said handle is inserted therein, a portion of said flange being captured between said channel sidewalls of said top rail in order to secure said handle to said erected box.

5,462,222

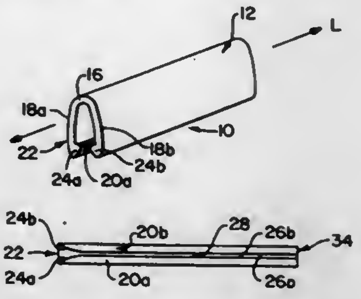
SEALING CLOSURE CLIP FOR GABLE TOP CONTAINER

Edgar L. Boeck, II, 265 Riverdale Dr., Fort Lee, N.J. 07024

Filed Jul. 15, 1994, Ser. No. 275,543

Int. Cl.^{6} B65D *45/16*

U.S. Cl. 229—125.39 **11 Claims**



1. A closure clip for the releasable fluid-tight engagement of the ridge of a gable top container, which ridge is defined by the closed spout disposed at the top of said container, that is initially sealed after the container is filled with a fluid to be dispensed, to reseal said ridge after breaking the initial closure seal of said spout, by compressing the outer adjacent side walls of the container defining said ridge, said closure clip comprising:

A. a longitudinally extended strip, said strip defining a pair of lateral edges and a substantially U-shaped longitudinally extending ridge located medial to said lateral edges;

B. a channel defined by said U-shaped ridge for slidably receiving the ridge of said gable top container, said slide-on insertion end for sliding the container ridge therein and wherein the respective beads are adjacently cooperatively tapered with a reduction in height, at a position near said insertion end, to said insertion end, whereby the cooperatively tapered beads function as a bevelled guide for the slide-on insertion of said ridge;

C. paired legs associated and coextensive with said lateral edges, each of said legs defining inner wall surfaces adjacent to and facing each other for engagement of the said container side walls; and

D. paired gripping beads defined on said inner wall surfaces for direct contact with the said container side walls;

E. wherein the beads are disposed with respect to each other such that the said container side walls are compressed by said beads into said fluid tight engagement with a resilient compressively enclosing grip.

5,462,223

PROCESS FOR COATING GLUE SPOT ROWS AND STRIPS ONTO LONGITUDINALLY EXTENDING BLANKS FOR HINGE-LID PACKS AND BLANKS PRODUCED THEREBY

Heinz Focke, and Michael Schlenker, both of Verden, Germany, assignors to Focke & Co. (GmbH & Co.), Verden, Germany

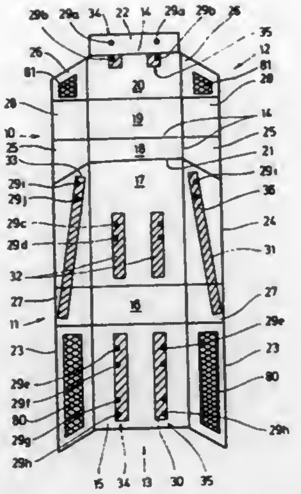
Filed Dec. 7, 1993, Ser. No. 162,262

Claims priority, application Germany, Dec. 8, 1992, 42 41 176.9

Int. Cl.^{6} B05D *5/10;* **B65D** *43/16*

U.S. Cl. 229—160.1 **3 Claims**

3. A longitudinally extending blank (**10**) for producing a hinge-lid pack adapted to receive a cigarette group wrapped in an inner wrapping (**82**) to form a cigarette block (**83**); said blank (**10**) comprising regions limited by folding lines (**14**) for formation of a pack including a pack part (**11**) and of a lid (**12**) flexibly connected thereto: the pack part (**11**) having a pack front wall (**15**), a pack rear wall (**17**), pack inner and outer side tabs (**23, 24**) that form two-layer pack side walls (**87**), and a pack bottom wall (**16**); the lid (**12**) consisting of a lid front wall (**20**), a lid top wall (**19**), and a lid inner tab (**22**) fastened to the inside of the lid front wall (**20**); each



pack also including a collar (**84**), consisting of a collar front wall (**85**) and of collar side tabs (**86**), which is connected to the pack front wall (**15**) and to the pack inner side tabs (**24**) by glue; the blank (**10**) being coated with a plurality of glue spots (**29***a*–**29***i*) and a plurality of glue strips (**80, 81**), wherein:

- a) the glue spots (**29***a*–**29***i*) are arranged on the blank in four parallel spot rows (**33, 34, 35, 36**) which extend in the longitudinal direction of the blank (**10**), and which are transversely spaced apart, so that longitudinally spaced pairs of longitudinally adjacent glue spots respectively define several glue areas;
- b) a first pair (**34, 35**) of said four spot rows is arranged on a middle strip (**13**) of the blank, said middle strip consisting of the pack front wall (**15**), the pack bottom wall (**16**), the pack rear wall (**17**), the lid rear wall (**18**), the lid top wall (**19**), the lid front wall (**20**) and the lid inner tab (**22**), in such a way that two pairs of longitudinally adjacent glue spots (**29**c, **29***d*) coated on the pack rear wall (**17**), and two pairs of longitudinally adjacent glue spots (**29***e*, **29***f*) coated on the pack front wall (**15**) and facing the pack bottom wall (**16**), define first and second glue areas, respectively, for fixing the inner wrapping (**82**) of the cigarette block (**83**) to the pack, and also in such a way that two pairs of longitudinally spaced glue spots (**29***g*, **29***h*), coated on the front wall (**15**) and facing a free edge thereof, create third and fourth glue areas, respectively, for fixing the collar front wall (**85**) to the pack part (**11**), and such that two pairs of longitudinally adjacent glue spots (**29***a*, **29***b*), coated on the lid inner tab (**22**) and on the lid front wall (**20**), create fifth and sixth glue areas, respectively, for fixing the lid inner tab (**22**) to the lid front wall (**20**);
- c) a second pair (**33, 36**) of said four spot rows is coated on the inner pack side tabs (**24**), respectively, the inner side tabs (**24**) being located on transversely opposite sides of the middle strip (**13**), in such a way that two pairs of longitudinally adjacent glue spots (**29***i*, **29***j*), coated on the inner side tabs (**24**), create seventh and eighth glue areas for fixing the collar side tabs (**86**) to the pack part (**11**); and
- d) the glue strips (**80, 81**), for connecting the pack outer side tabs (**23**) to the pack inner side tabs (**24**), and the outer lid side tabs (**26**) to the inner lid side tabs (**25**), are respectively located on the pack outer side tabs (**23**) and outer lid side tabs (**26**) only transversely outside of said middle strip (**13**).

5,462,224

HOT AND COLD WATER MIXING DISCHARGE DEVICE

Masatoshi Enoki; Osamu Tokunaga; Shinichi Yamato, and Masahiko Imazono, all of Kitakyushu, Japan, assignors to Toto Ltd., Kitakyushu, Japan

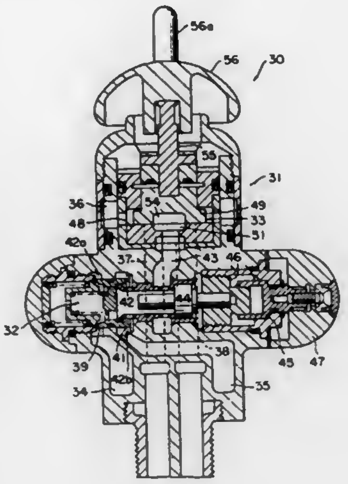
Division of Ser. No. 187,825, Jan. 27, 1994, abandoned, which is a division of Ser. No. 867,234, Jun. 3, 1992, abandoned.

This application Sep. 8, 1994, Ser. No. 303,578

Claims priority, application Japan, Jan. 5, 1990, 2-269095

Int. Cl.^{6} G05D *23/13*

U.S. Cl. 236—12.13 **6 Claims**

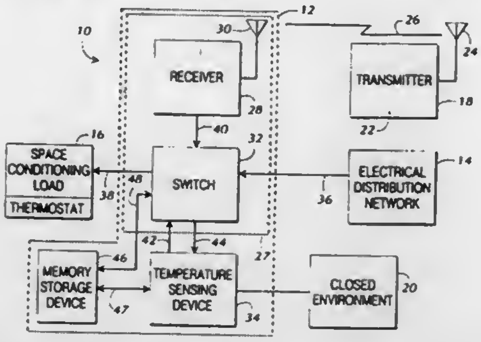


1. A hot and cold water mixing discharge device comprising a cold water inflow passage connected to a cold water source; a hot water inflow passage connected to a hot water source; a mixing chamber in which a cold water and a hot water are mixed together to make a warm water; an automatic temperature control means provided between said chamber and each of said passages so that the ratio of the flow rates of said cold and hot waters flowing into said chamber is automatically modulated by said means depending on a preset temperature for said warm water; a warm water passage communicating with said chamber; a by-pass including a cold water by-pass portion for connecting the cold water inflow passage to the warm water passage around the automatic temperature control means and a hot water by-pass portion for connecting the hot water inflow passage to said warm water passage around said control means; a flow rate control means provided at the downstream end of the by-pass in order to regulate the flow rate of said cold or hot water flowing from said by-pass to said warm water passage and the flow rate of the warm water; said flow rate control means being provided with a valve sheet having a cold water inflow hole, a hot water inflow hole and a warm water inflow hole and a valve means for controlling a fluid from said inflow holes; a single operating means for operating said flow rate control means; and a discharge port provided at the downstream end of said warm water passage.

5,462,225

APPARATUS AND METHOD FOR CONTROLLING DISTRIBUTION OF ELECTRICAL ENERGY TO A SPACE CONDITIONING LOAD

James M. Massara, Dunwoody, and Glenn A. Davis, Lilburn, both of Ga., assignors to Scientific-Atlanta, Inc., Atlanta, Ga.
Filed Feb. 4, 1994, Ser. No. 192,163
Int. Cl.⁶ H02J ***1/00;*** **G05D** ***23/00***
U.S. Cl. 236—47 **49 Claims**



1. An improved load control apparatus for controlling distribution of electrical energy by an electrical distribution network to a space conditioning load that conducts space conditioning operations within a closed environment, the space conditioning operations being controlled by a thermostat in response to the control temperature setpoint of said thermostat, comprising:

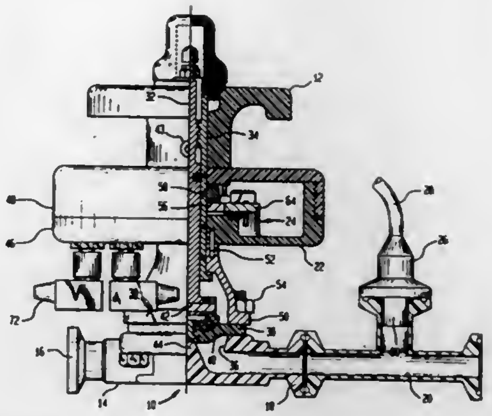
control means, connected to said space conditioning load via said thermostat and to said electrical distribution network, for interrupting distribution of said electrical energy to said space conditioning load by removing said space conditioning load from said electrical distribution network for a selected time period in response to a selected one of a plurality of command signals transmitted by a command center that is remotely located from said load control apparatus, said selected time period being a variable time period having a time interval that is dependent upon the historical duty cycle of said space conditioning load; and

temperature sensing means, connected to said control means, for sensing space temperatures within said closed environment, said temperature sensing means operative to override control by said control means of distribution of said electrical energy to said space conditioning load prior to expiration of said selected time period by outputting a control override signal to said control means in response to sensing one of said space temperatures that exceeds a maximum space temperature limit, said maximum space temperature limit being greater than the control temperature setpoint.

5,462,226

TEMPERATURE-RESPONSIVE, LOCKING MECHANISM FOR, AND IN COMBINATION WITH, A FLUID VALVE

Richard D. Randall, York, and Alan W. Bucher, Manheim, both of Pa., assignors to ITT Corporation, New York, N.Y.
Filed Nov. 7, 1994, Ser. No. 334,903
Int. Cl.⁶ G05D ***23/00***
U.S. Cl. 236—93 R **12 Claims**



9. In combination with a fluid valve, a temperature-responsive, locking mechanism therefor, comprising:

a valve body having means formed therein for conducting fluid therethrough; wherein

said body further has an opening formed therein; and

means movable onto, and removable from, said opening, for obstructing and permitting fluid flow through said body, respectively; wherein

said movable means comprises a flexible closure element;

a translatable spindle coupled to said element; wherein

said spindle is threaded;

a rotatable, threaded bushing; wherein

said spindle and bushing are threadedly engaged to cause translation of said spindle in response to rotation of said bushing;

a handwheel fastened to said bushing;

an annulus coupled to said bushing for rotation therewith;

a platform coupled to said body;

a solenoid mounted to said platform;

a fluid-temperature-operative, electric switch coupled to said solenoid for effecting solenoid operation;

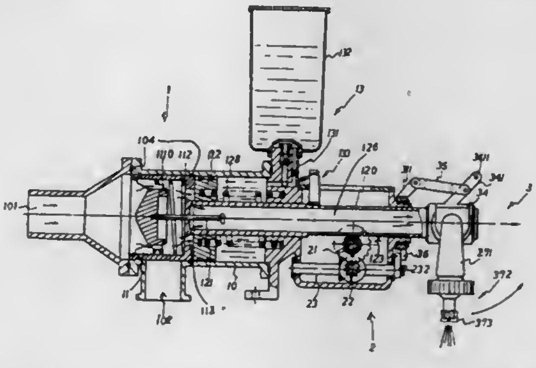
a source of enabling electric power connected to said switch and to said solenoid; and

locking means, coupled to said solenoid, and in proximity to said annulus, actable in response to solenoid operation, for engaging said annulus and preventing rotation of said bushing.

5,462,227

AUTOMATIC CLEANING DEVICE FOR USE ON A STOCK FARM

Wu K. Ping, 62 Fu Tsao, Bie Jeau Li, Tu Koo Town, Yung Lin Hsien, Taiwan, Prov. of China
Filed Aug. 24, 1994, Ser. No. 294,986
Int. Cl.⁶ B05B ***3/16***
U.S. Cl. 239—227 **1 Claim**



1. An automatic cleaning device for use on a stock farm, comprising a switching system, a transmission case and a sprinkling system, wherein:

said automatic switching system includes a main body, a valve seat, a slidable piston and a hydraulic means, said main body having a water entrance for receiving water pumped in by a water pump, a bypass disposed on a lateral side of said main body, an interior space for containing said valve seat and said slidable piston and two O-rings embedded in said main body for restricting said valve seat from moving, wherein:

said valve seat has a conic valve body disposed in said valve seat, a compression spring disposed at a rear end of said conic valve body confined between a rear end of said valve seat, an engaging step portion and an annular groove being respectively formed at two ends of said valve seat for engaging with said O-rings of said main body, a thread hole being formed on a central portion of said rear end of said conic valve body;

said slidable piston being a hollow tube member having a through hole, a sealing disk being disposed at a front end of said slidable piston for completely shutting off water flow, a shaft rod axially extending from a rear end of said sealing disk, said shaft rod being stepped, having a large diameter portion and a small diameter portion, a row of teeth being axially formed on an outer wall of a bottom of said small diameter portion of said shaft rod, a U-shaped member being fixedly disposed at a front end of said slidable piston across said through hole, an orifice being formed at a central portion of said U-shaped member, whereby a linking rod is fixed in said orifice to screw into said thread hole of said conic valve body, a restoring spring being fitted on said shaft rod of said slidable piston; and

said hydaulic means includes a main body, an oil cup and a flow controlling mechanism, wherein said main body of said hydraulic means is screwed on a rear end of said main body of said automatic switching system and formed with a first, a second and a third passage, each communicating with said oil cup, a one-way valve body being disposed in said first passage, an adjusting hole being transversely formed on a lateral side of said main body of said hydraulic means to communicate with each said first and second passage, an adjusting bolt being disposed in said adjusting hole for controlling amount of oil flow, said flow controlling mechanism including a controlling lever, a bamboo shoot-like spring, a tension spring, a one-way ratchet assembly and a slidable arch block, a top end of said controlling lever being formed with a transverse through hole communicating with said third passage of said main body of said hydraulic means, said controlling lever being fitted with said bamboo shoot-like spring and said one-way ratchet assembly and rotatably fixed on said main body of said hydraulic means by a bolt, said one-way ratchet assembly including a male and a female disks, wherein said female disk is fixed at one end of said controlling lever by a pin member, said male disk having a lug connected with said tension spring which is further connected with said slidable arch block, said slidable arch block being slidably fitted on a slide rod of said transmission case and slightly contacts with said shaft rod of said slidable piston;

a splined circular rod is rotatably disposed in said transmisstion case for meshing with said teeth of said shaft rod, a gear being disposed at one end of said splined circular rod and a one-way bearing being disposed in said gear so that said circular rod drives said gear to rotate in only one direction, said gear being further engaged with a splined portion of a first rotary rod to create a speeding effect, a bevel gear being disposed at one end of said first rotary rod to mesh with a bevel gear of a second rotary rod which is disposed perpendicular to said first rotary rod; and

said sprinkling system includes a rotatable ring member, a connecting pipe, a three-way connector, a U-shaped swinging block, a linking lever, a connecting arch block and a sprinkling means, wherein said ring member is rotatably fitted on said shaft rod of said transmission case and formed with a projection pivotally connected with said linking lever and a lug pivotally connected with said connecting arch block, said connecting pipe being connected with an end of said shaft rod and formed with two opposite diametric through holes and a close front end, said connecting pipe being further formed with a first annular groove for containing steel balls and a second annular groove for containing a waterproof washer and connected with said three-way connector, whereby by means of said steel balls, said three-way connector is able to rotate relative to said connecting pipe frictionlessly, said sprinkling means including a connecting block and a sprinkling head, said connecting block being U-shaped and formed with inner through hole which communicates with said three-way connector, said connecting block being formed with an opening communicating with said sprinkling head, said U-shaped swinging block being connected with said sprinkling means and having an upward extending connecting block on which several pivot holes are disposed at equal intervals, said linking lever being pivotally connected between said projection of said ring member and said connecting block, whereby when said shaft rod moves forward, because said ring member is only able to rotate about said shaft rod while unable to slide back and forth therealong, said ring member via said linking lever makes said swinging block pivot forward and at this time, because said swinging block is fixedly connected with said sprinkling head of said sprinkling means, said sprinkling head is pivoted downward through a certain angle, a starting point of said sprinkling head is adjustable by means of changing said pivot holes of said connecting block for pivotally connecting with said linking lever, said cleaning device being characterized in that said water pump is connected with said water entrance of said main body of said automatic switching system through a water tube, said main body of said automatic switching system containing hydraulic oil which is confined by said sealing disk of said slidable piston, said hydraulic means being screwed on said rear end of said main body of said automatic switching system, said three passages of said main body of said hydraulic means communicating with said oil cup and said adjusting bolt and flow controlling mechanism being used to control the amount of oil flow, said shaft rod extending through said rear end of said main body of said automatic switching system into said interior thereof so as to transmit hydraulic power to and drive said splined circular rod and said first and second rotary rods in said transmisstion case which convert linear movement of said shaft rod into rotary movement of said sprinkling head, said sprinkling means being connected with said rear end of said shaft rod, whereby by means of cooperation of said linking lever and said connecting arch block, said linear movement of said shaft rod and said rotary movement of said second rotary rod result in up and down pivoting movement and left and right swinging movement of said sprinkling head, and by means of changing said pivot holes of said connecting block for pivotally connecting with said linking lever, the starting point of said sprinkling head is adjustable.

5,462,228

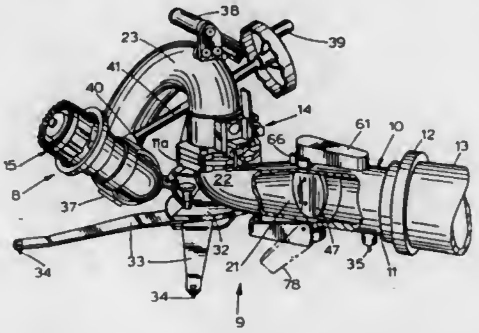
MONITOR WITH SAFETY VALVE

Stewart G. McMillan, Valparaiso, and David J. Kolacz, Plymouth, both of Ind., assignors to Task Force Tips, Inc., Valparaiso, Ind.

Continuation of Ser. No. 166,722, Dec. 13, 1993, abandoned. This application Jun. 2, 1994, Ser. No. 253,227

Int. Cl.^{6} B05B *15/06;* **A62C** *39/00*

U.S. Cl. 239—285 **12 Claims**



1. A portable base for a monitor, said base being operable to convey a liquid from a supply to the monitor, said base when in customary use being placed in an operating position on a support surface, said base comprising a conduit forming a flow passage between an inlet end and an outlet end, said inlet end being connectable to said supply and said outlet end being connectable to the monitor, and valve means mounted on said conduit for automatically closing said flow passage in the event that said base lifts off the support surface, said valve means including a valve pivot-

ably mounted in said flow passage and movable between open and closed positions, and trip means connected to said valve and responsive to the base lifting from the support surface for moving said valve to said closed position.

5,462,229

STEAM INJECTOR

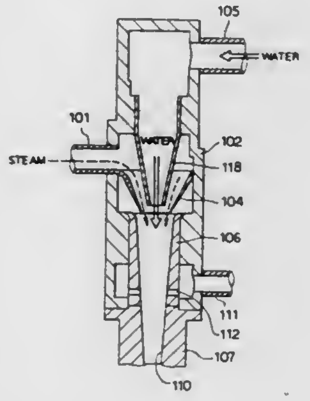
Nobuhiko Tanaka; Tadashi Narabayashi, both of Yokohama; Hiroshi Miyano, Kamakura; Hideaki Takahashi, Tokyo; Katsumi Yamada, Fujisawa, and Makoto Yasuda, Yokohama, all of, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Division of Ser. No. 943,760, Sep. 11, 1992, Pat. No. 5,323,967. This application Mar. 23, 1994, Ser. No. 216,608

Claims priority, application Japan, Sep. 13, 1991, 3-234707; Sep. 19, 1991, 3-239346; Jan. 30, 1991, 3-284924

Int. Cl.^{6} B05B *7/04;7/00*

U.S. Cl. 239—397.5 **4 Claims**



1. A steam injector comprising:

a casing provided with a steam intake port and a water supply port;

a steam jetting nozzle disposed inside the casing so as to extend axially therein and communicated with the steam intake port for introducing steam into the casing;

a water nozzle disposed inside the casing, said water nozzle being communicated with the water supply port and introducing water into the casing;

a steam-water mixing nozzle disposed inside the casing and on a downstream side of the steam jetting nozzle and the water nozzle, said steam jetting nozzle having a front end facing the steam-water mixing nozzle;

a diffuser disposed inside the casing and on a downstream side of the steam jetting nozzle, said diffuser being provided with a throat portion; and

a discharge port formed in the casing on a downstream side of the diffuser,

wherein said water nozzle is disposed inside said steam jetting nozzle so as to provide a double structure with a hollow portion therebetween to realize a vacuum heat insulation state therein, and wherein said water nozzle has a front end with respect to a flow of water, said front end being formed so as to reduce a hydraulic equivalent diameter.

5,462,230

OUTFLOW NOZZLE HAVING INDEPENDENTLY ADJUSTABLE OUTFLOW PIPES

Pieter J. Van Ouwerkerk, Zaandam, Netherlands, assignor to P.J. Van Ouwerkerk Holding B.V., Zaandam, Netherlands

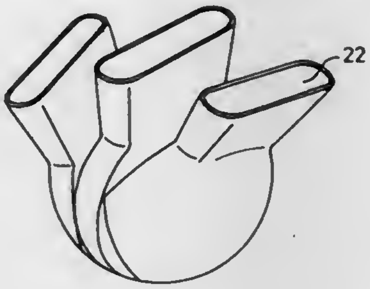
PCT No. PCT/NL92/00139, § 371 Date Apr. 14, 1994, § 102(e) Date Apr. 14, 1994, PCT Pub. No. WO93/02881, PCT Pub. Date Feb. 18, 1993

PCT Filed Aug. 3, 1992, Ser. No. 190,104

Claims priority, application Netherlands, Aug. 2, 1991, 9101337

Int. Cl.^{6} B05B *1/14;7/00;15/08*

U.S. Cl. 239—428.5 **9 Claims**



1. Outflow nozzle comprising a support with an outflow element pivotally arranged therein, said outflow element having a spherical end confined so that it rotates inside a boundary of a cavity of the support, said outflow element comprising at least two adjacent outflow pipes, each outflow pipe being provided with a spherical part, wherein the spherical parts of the outflow pipes together essentially form the spherical end, and wherein boundary faces of two adjacent spherical parts are arranged to move over each other, such that the direction of discharge of each outflow pipe may be independently adjusted with respect to the direction of discharge of any said adjacent outflow pipe.

5,462,231

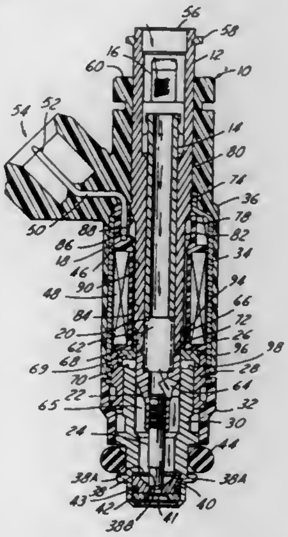
COIL FOR SMALL DIAMETER WELDED FUEL INJECTOR

Bryan C. Hall, Newport News, Va., assignor to Siemens Automotive L.P., Auburn Hills, Mich.

Filed Aug. 18, 1994, Ser. No. 292,456

Int. Cl.^{6} F16K *31/06*

U.S. Cl. 239—585.4 **26 Claims**



1. An electrically operated fuel injector for injecting fuel into an internal combustion engine comprising an internal passage within

said fuel injector for conveying fuel from a fuel inlet at which fuel enters the fuel injector to a nozzle at which fuel is injected from the fuel injector, an electromagnetic coil assembly comprising a non-ferromagnetic bobbin having an axial through-hole and an electromagnetic coil disposed on said bobbin so as to be generally coaxial with said through-hole, a stator disposed in said bobbin's through-hole to form a portion of a stator structure that forms one part of a magnetic circuit for magnetic flux generated by said coil, a mechanism that is internal to said fuel injector for selectively opening and closing said internal passage and that includes an armature and a valve, said armature forming another part of said magnetic circuit through a working gap to said stator structure for enabling said armature to operate said valve in accordance with selective energizing of said coil to selectively open and close said internal passage, said armature being axially reciprocated toward and away from said stator structure by selective energizing of said coil, wherein said bobbin's through-hole comprises a smaller diameter portion and a larger diameter portion, said larger diameter portion is disposed axially more distant from said nozzle than is said smaller diameter portion, a tubular part is joined in fluid-tight relation to an end of said stator by means of a joint that is at least partially disposed within said smaller diameter portion of said bobbin's through-hole, said stator comprises a smaller outside diameter portion at said joint and a larger outside diameter portion that is disposed axially of said smaller outside diameter portion, said larger diameter portion of said bobbin's through-hole and said smaller outside diameter portion of said stator being mutually axially overlapping to an extent that, during process when the fuel injector was fabricated, enabled said electromagnetic coil assembly to be disposed axially on said stator to a position where both said larger diameter portion of said bobbin's through-hole and said larger outside diameter portion of said stator mutually axially overlapped to an extent that allowed said electromagnetic coil assembly to be disposed in a position leaving a sufficient axial extent of said end of said stator clear of said electromagnetic coil assembly so as to allow said joint to be created, and after creation of said joint, enabled said electromagnetic coil assembly to return to a position disposing at least a portion of said joint within said smaller diameter portion of said bobbin's through-hole.

5,462,232

ROTATING LIQUID DISTRIBUTOR FOR USE WITH A SPREADER FOR LIQUID MANURE OR OTHER FLUIDS

Kjell Vastveit, N-4160 Judaberg, Norway

PCT No. PCT/No92/00076, § 371 Date Oct. 15, 1993, § 102(e) Date Oct. 15, 1993, PCT Pub. No. WO92/17996, PCT Pub. Date Oct. 29, 1992

PCT Filed Apr. 15, 1992, Ser. No. 137,065

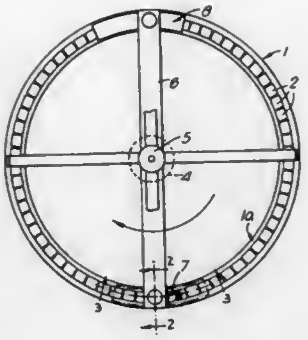
Claims priority, application Norway, Apr. 19, 1991, 911550

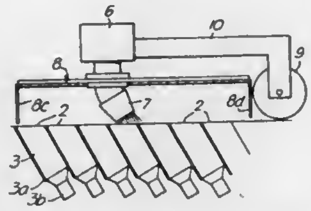
Int. Cl.^{6} A01C *23/04*

U.S. Cl. 239—662 **8 Claims**

1. A rotating liquid distributor for a spreader of liquid manure, water or other liquid compounds comprising

- a) a non-rotatable circular distributor housing with a horizontal bottom, an annular channel that opens upwards from the horizontal bottom, at a peripheral portion of the horizontal bottom, said annular channel including a radially inner side wall and a radially outer side wall,
- b) outlet openings in the horizontal bottom at the peripheral portion spaced between the radially inner and radially outer side walls of the annular channel and distributed around said peripheral portion,
- c) hose members extending downwardly from the respective outlet openings in the horizontal bottom,
- d) a rotatable hollow vertical rotor stem centrally positioned in the distributor housing for rotation about a vertical axis, said rotor stem being adapted to receive a supply of liquid under pressure, a hollow transverse radial rotor arm coupled to the rotor stem such that the hollow space within the rotor stem communicates with the hollow space within the rotor arm and the rotor arm is rotatable with the rotor stem, said rotor arm





having at least one nozzle slanted downwardly toward the horizontal bottom in flush radial alignment with the outlet openings in the horizontal bottom,

- e) a screen with a U-shaped cross-section joined to said at least one nozzle for positioning within the annular channel such that the open end of the U-shaped cross-section extends downwardly into the annular channel, said screen including opposite side walls corresponding to the radially inner and radially outer side walls of the annular channel, and a base joining the opposite side walls, the base being in an upper position relative to a nozzle opening of the at least one nozzle, and the opposite side walls of the screen being disposed alongside the corresponding side walls of the annular channel, whereby liquid supplied under pressure to said hollow rotor stem produces a turning moment in said rotor arm when the liquid is dispensed from said at least one nozzle into said outlet openings and through said hose members.

5,462,233

PROCESS FOR RECYCLING EXPANDED PARTICLE MOLDINGS

Kiba Isao, and Kaneko Masamichi, both of Suzuka, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

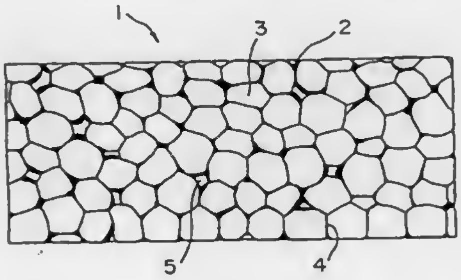
Filed Feb. 16, 1994, Ser. No. 193,005

Claims priority, application Japan, Aug. 10, 1992, 4-232628

Int. Cl.^{6} B02C *23/18*

U.S. Cl. 241—18 **16 Claims**

1. A process for recovering expanded particles from an expanded



particle molding comprising expanded particles of a synthetic resin coated with a thermoplastic resin whose melting point is lower than that of the synthetic resin of the expanded particles, which process comprises the steps of:

softening or melting the thermoplastic resin by heating, and separating the molding into individual expanded particles by applying a shearing force to the molding under circumstances such that bond strength among the expanded particles is weakened.

5,462,234

GRINDING PLANT AND METHOD OF GRINDING AND CLASSIFYING BRITTLE MATERIAL FOR GRINDING

Norbert Patzelt; Gotthard Blasczyk, and Hubert Eickholt, all of Beckum, Germany, assignors to Krupp Polysius AG, Beckum, Germany

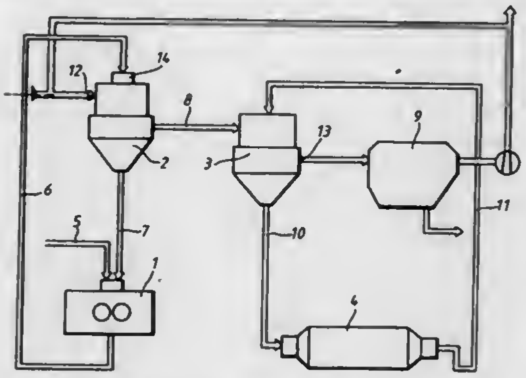
Filed Apr. 21, 1994, Ser. No. 230,628

Claims priority, application Germany, Jun. 16, 1993, 43 20 025.7

Int. Cl.^{6} B02C *21/00;23/12;23/14;23/32*

U.S. Cl. 241—19 **9 Claims**

1. Method of grinding and classifying brittle material for grinding comprising the steps of:



a) crushing the material in a primary mill;

b) feeding the crushed material to a first classifier and classifying the crushed material into relatively coarser and finer fractions;

c) returning the coarser fraction of the crushed material back to the primary mill and passing the finer fraction of crushed material into a second classifier and further separating the finer fraction into fine material and coarse material;

d) delivering the coarse material to a fine grinding mill and grinding the coarse material;

e) mechanically conveying the material ground in the fine grinding mill back to the second classifier for further separation; and

f) passing a stream of air consecutively through the first and second classifiers, wherein the entire air stream passing through the second classifier originates from the first classifier.

5,462,235

AGGREGATE PRODUCING MACHINE

Mary E. Driscoll, Lexington, and Karl D. Taub, Boxboro, both of Mass., assignors to W. R. Grace & Co.-Conn., New York, N.Y.

Filed Dec. 8, 1992, Ser. No. 986,817

Int. Cl.^{6} B02C *13/286;13/288*

U.S. Cl. 241—30 **17 Claims**

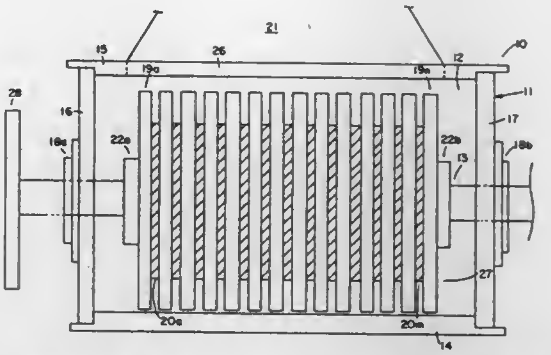
1. A method of shredding expanded polystyrene board, comprising:

a) providing a shredding apparatus for shredding a board, said shredding apparatus comprising a shredding box defining a shredding chamber; a rotor housed in said shredding box; means for driving said rotor; a plurality of cutting means coupled to said rotor in linear succession, each cutting means having a plurality of spaced apart teeth, each successive cutting means being coupled to said rotor such that its teeth lie about halfway between the teeth of an adjacent cutting means, said plurality of cutting means defining a shredder head; board orientation means for receiving said board and orienting it into contact with said shredder head in the space between the center line of the rotor and the bottom of the shredder head, comprising i) an opening for receiving said board, the height of said opening sized slightly smaller than the thickness of said board; and ii) top board feed guide means for supporting substantially the entire top surface of said board in said shredding chamber, said board feed guide means further comprising an edge in close proximal contact with said shredder head; and take-away means, coupled to said shredder box for removing shredded material from said shredding chamber, said take-away means communicating with said shredding chamber via an aperture located above the interface of said shredder head and said board guide means;

b) causing said shredder head to rotate at a speed sufficient to shred said board and produce shredded aggregate;

c) feeding said board into said shredding chamber so as to contact said board with said shredder head, thus making shredded aggregate; and

d) removing from said chamber said shredded aggregate.



5,462,236

CALIBRATEABLE TIMED WEIGHT GRINDER

John T. Knepler, Chatham, Ill., assignor to Bunn-O-Matic Corporation, Springfield, Ill.

Filed Mar. 24, 1994, Ser. No. 217,409

Int. Cl.^{6} B02C *19/12*

U.S. Cl. 241—34 **9 Claims**

1. A coffee grinding apparatus which measures a quantity of coffee for grinding as a function of time, said coffee grinding apparatus comprising:

at least one storage hopper;

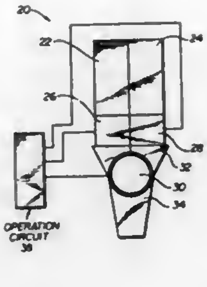
a controllable dispenser associated with each of said at least one storage hopper for controllably dispensing beans from the associated one of said storage hoppers;

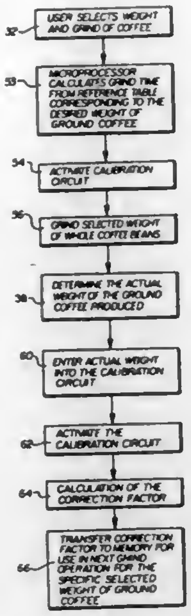
a grinding mechanism operatively associated with said controllable dispenser for grinding beans received therefrom and discharging ground coffee;

a control circuit coupled with said controllable dispenser for selectively operating said dispenser to dispense a desired quantity of coffee beans into said grinding mechanism;

selection means coupled with said control circuit for allowing a user to select a desired weight of ground coffee to be produced; and

calibration means coupled to said control circuit, said calibration means including user operable controls for entering an actual weight of the ground coffee discharged from said grinding mechanism; a microprocessor for calculating a correction factor corresponding to the entered actual weight, said calibration means entering the actual weight of ground coffee into said microprocessor for use in calculating a correction factor; and storage means for storing a plurality of frequently selected weight settings and for storing a plurality of correction factors corresponding to a plurality of weight settings.




32 USER SELECTS WEIGHT AND GRIND OF COFFEE
53 MICROPROCESSOR CALCULATES GRIND TIME FROM REFERENCE TABLE CORRESPONDING TO THE DESIRED WEIGHT OF GROUND COFFEE
54 ACTIVATE CALIBRATION CIRCUIT
56 GRIND SELECTED WEIGHT OF WHOLE COFFEE BEANS
58 DETERMINE THE ACTUAL WEIGHT OF THE GROUND COFFEE PRODUCED
60 ENTER ACTUAL WEIGHT INTO THE CALIBRATION CIRCUIT
62 ACTIVATE THE CALIBRATION CIRCUIT
64 CALCULATION OF THE CORRECTION FACTOR
66 TRANSFER CORRECTION FACTOR TO MEMORY FOR USE IN NEXT GRIND OPERATION FOR THE SPECIFIC SELECTED WEIGHT OF GROUND COFFEE

5,462,237

CRUSHING UNIT IN A CLINKER COOLER

Hans-Peter Wellmann, Buxtehude, Germany, assignor to Claudius Peters Aktiengesellschaft, Buxtehude, Germany

PCT No. PCT/EP92/01265, § 371 Date Dec. 3, 1993, § 102(e) Date Dec. 3, 1993, PCT Pub. No. WO92/21441, PCT Pub. Date Dec. 10, 1992

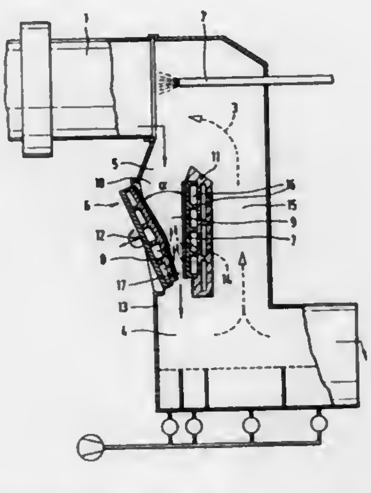
PCT Filed Jun. 5, 1992, Ser. No. 157,084

Claims priority, application Germany, Jun. 5, 1991, 41 18 465.3

Int. Cl.^{6} F23G *5/033;* **B02C** *1/10;23/24*

U.S. Cl. 241—57 **11 Claims**

1. In a combination of a furnace having an outlet for discharging high temperature cement clinker material, a cooler spaced from the outlet for receiving the discharged material for cooling thereof, a duct leading from the furnace outlet toward the cooler and a crushing unit mounted within the duct intermediate the furnace outlet and the cooler, the improvement wherein the crushing unit is a jaw crusher having a stationary jaw within the duct and a movable jaw immediately adjacent a side portion of the duct, said crushing jaws being provided with cooling devices, said movable jaw being movable relative to the stationary jaw and forming therewith a discharge crushing chamber for controlling the particle size of the high temperature material flowing through the duct toward the cooler.



5,462,238

APPARATUS AND METHOD FOR SHREDDING INSULATION

Donald K. Smith; Stephen J. Haddix, and Randall J. Blomquist, all of Bend, Oreg., assignors to Guaranteed Baffle Co., Inc., and Norpac GSE, both of Bend, Oreg.

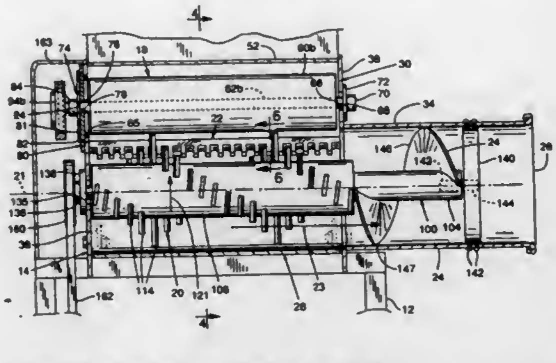
Continuation of Ser. No. 210,515, Mar. 17, 1994, abandoned.

This application Feb. 9, 1995, Ser. No. 388,163

Int. Cl.^{6} B02C *18/18;18/22*

U.S. Cl. 241—243 **2 Claims**

1. A machine for shredding material, comprising:



a housing having an inlet for the material;

a blade assembly positioned within the housing adjacent the inlet, the blade assembly being rotatable about an axis defining a flow direction for the material, whereby rotation of the blade assembly induces material fed through the inlet to the housing to flow along the axis towards one end of the blade assembly,

the blade assembly having a plurality of generally radially extending knife blades arranged in a helix about the axis, the knife blades each being relatively planar and having a leading cutting edge and a trailing edge,

each of the knife blades being disposed generally transversely to the axis but being rotated about a radial line drawn from the axis through the blade such that the cutting edge of the blade is positioned relatively further toward the one end of the blade assembly than is the trailing edge thereof, the blade assembly being operable to catch the material fed into the housing and move it in the flow direction, the rotated trailing edges of the knife blades serving to decrease the speed of movement of the material in the flow direction; and

an obstruction member connected to the housing adjacent the blade assembly, the obstruction member comprising a fixed member having fingers interdigitated with the blades of the blade assembly, the obstruction member obstructing the insulation caught on the rotating blade assembly, whereby the blades shred the material.

5,462,239

METHOD AND APPARATUS FOR WINDING A YARN ONTO A BOBBIN TUBE

Werner Klee, Seuzach, and Thomas Gisel, Thun, both of, Switzerland, assignors to Maschinenfabrik Rieter AG, Winterthur, Switzerland

Filed Jul. 22, 1993, Ser. No. 96,015

Claims priority, application Switzerland, Jul. 23, 1992, 02332/92

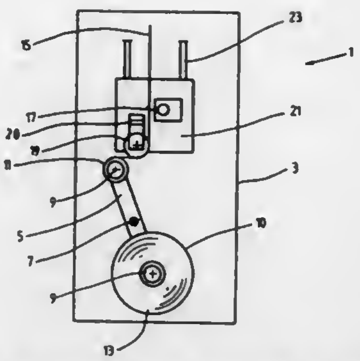
Int. Cl.^{6} B65H *54/42;54/02*

U.S. Cl. 242—18 R **13 Claims**

1. A method for winding yarn into a bobbin tube, said method comprising the steps of

mounting a bobbin tube on a rotatable chuck driven by a first drive motor;

positioning the chuck mounted bobbin tube in spaced relation to a periphery of a rotatable contact roller driven by a second drive motor to define a gap of predetermined size therebetween;



rotating the contact roller while rotating the chuck to wind the delivered yarn onto the bobbin tube to form a bobbin;

rotating the chuck during an initial phase of winding of the yarn onto the bobbin tube at a predetermined speed ramp until the bobbin contacts said periphery of the contact roller;

sensing a change of an ascertainable operating parameter of at least one of the chuck and contact roller in response to said contact of the bobbin with the contact roller; and

thereafter changing the speed of rotation of the chuck to maintain a predefined output signal from the contact roller representing a predetermined circumferential speed of the bobbin.

5,462,240
PHOTOGRAPHIC FILM CASSETTE AND METHOD OF ASSEMBLING THE PHOTOGRPAHIC FILM CASSETTE

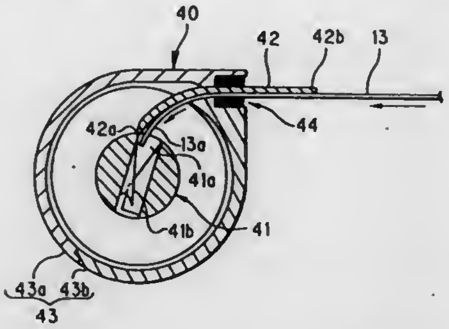
Toshiro Esaki; Mituru Suzuki; Susumu Sato; Kohichi Takahashi, and Makoto Shimizu, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 15, 1993, Ser. No. 91,627

Claims priority, application Japan, Jul. 16, 1992, 4-189731

Int. Cl.^{6} G03B *17/26*

U.S. Cl. 242—348.1 **10 Claims**



6. A photographic film cassette having a cassette shell comprising a pair of shell halves made of a resin material, a film passage mouth being defined between said shell halves, a spool mounted in said cassette shell in a rotatable manner, and a photographic filmstrip adapted to be wound about said spool, said photographic film cassette comprising:

a slit formed in said spool, said slit extending in an axial direction of said spool;

at least a claw formed on an inside surface of said slit for securing a trailing end of said photographic filmstrip to said spool by virtue of engagement between said claw and said filmstrip;

a film guide member formed integrally with said spool for guiding said trailing end of said photographic filmstrip into said slit, a free end of said film guide member extending outside of said cassette shell through said film passage mouth when said shell halves are joined together to form said cassette shell before said photographic filmstrip is secured to said spool and wound into said cassette shell by rotating said spool,

said film guide member has a thinned portion formed proximate said spool so as to facilitate separating said film guide member from said spool.

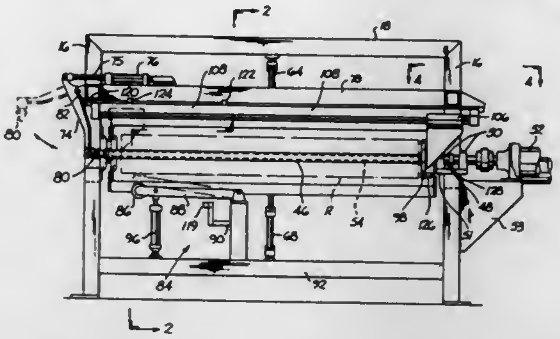
5,462,241
RUG WINDING APPARATUS

Dwight E. Howden, Jr., 2029 Brookview Dr., Dalton, Ga. 30720

Filed Sep. 29, 1994, Ser. No. 315,226

Int. Cl.^{6} B65H *18/10;19/30*

U.S. Cl. 242—533.7 **22 Claims**



1. A web winding machine comprising an axially extending substantially cylindrical hollow mandrel about which a web of material is to be wound into a roll and thereafter discharged, said mandrel having a driven end and a web discharge end remote from said driven end, bearing means supporting said mandrel at said driven end, motor means at said driven end for rotatably driving said mandrel about an axis of rotation to wind said web thereon into a roll, removable end support means for supporting said discharge end of said mandrel at least while said web is being wound into said roll and removable from said discharge end to permit said roll to be removed from said discharge end, end support actuation means for moving said end support means selectively into and out of supporting relationship with said discharge end, pusher means movable in a direction substantially parallel to said axis of rotation from said driven end toward said discharge end for engaging said roll after it has been wound and pushing said roll off said mandrel after said support means has been removed from said discharge end, a support carriage adjacent said discharge end movable selectively into a roll supporting position for supporting said roll while on said mandrel and into a stowed position displaced from said roll, and carriage actuation means for moving said carriage into disposition for supporting said roll after said roll has been formed and prior to and after removal of said end support means from said discharge end, whereby said roll and thus said mandrel remains supported adjacent each end.

5,462,242
HELICOPTER LANDING GEAR ASSEMBLY

Bobby A. Collins, Bedford; Glenn R. Grimes, Arlington, and Dharam J. Reddy, Hurst, all of Tex., assignors to Bell Helicopter Textron Inc., Fort Worth, Tex.

Filed Nov. 5, 1993, Ser. No. 147,851

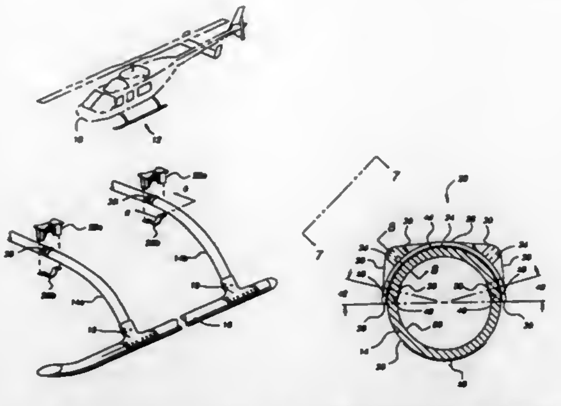
Int. Cl.^{6} B64C *25/52*

U.S. Cl. 244—108 **26 Claims**

1. An improved replacement helicopter landing gear assembly, of the type having a bracket extending from a helicopter fuselage into engagement with a strap on top of a generally cylindrical crosstube that supports landing devices, the bracket engaging the strap and stabilizing the fuselage with respect to the crosstube, the improvement comprising:

the strap having an inner surface adapted to engage an outer surface of the crosstube;

the strap having an outer surface including a stop surface for mating with the bracket to minimize lateral movement of the bracket on the strap;



- the strap extending over the top of the crosstube and generally half way around the crosstube, terminating in two lower edges that extend axially with respect to the crosstube;
- the strap having a plurality of strap fastener holes located proximate to the neutral bending axis of the crosstube to minimize stress at the strap fastener holes, the strap being otherwise imperforate to minimize stress concentration;
- the crosstube having crosstube fastener holes registering with the strap fastener holes on the strap;
- the strap being fastened to the crosstube through the strap fastener holes and crosstube fastener holes; and
- the outer surface and an inner surface of the crosstube having built-in residual compressive stresses for improving fatigue strength and improving resistance to corrosion and mechanical damage.

5,462,243

AIRCRAFT PASSENGER WINDOW MAINTENANCE SHIELD

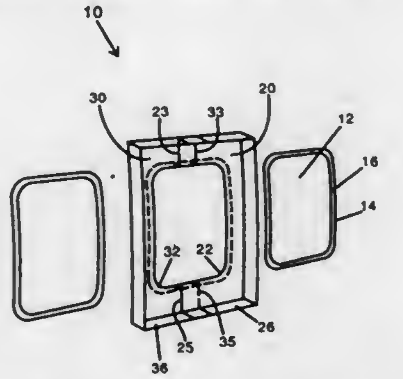
Raymond F. Hart, and Michele A. Hart, both of 2121 S. Pennington St. Suite 17, Mesa, Ariz. 85202

Filed Feb. 9, 1994, Ser. No. 193,744

Int. Cl.⁶ B64D *47/00;* **B64F** *5/00*

U.S. Cl. 244—121 **17 Claims**

1. An aircraft passenger window maintenance shield to be affixed to an outer passenger window frame surrounding a window of an aircraft during aircraft window maintenance involving rotary powered equipment, said shield comprising:



- a first element and a second element, said first element to be secured to the outer passenger window frame of the aircraft by a first securing means, said first element having a first overlapped edge and a first overlapping edge, said second element to be secured to the outer passenger window frame by a second securing means, said second element having a second overlapping edge and a second overlapped edge, said first element and said second element being slidingly interfitted with said first overlapped edge being overlapped by said second overlapping edge and said second overlapped edge being overlapped by said first overlapping edge, said first element being substantially rectangular with a first generally c-shaped opening to permit access to the aircraft window, said second element being substantially rectangular with a second generally c-shaped opening to permit access to the aircraft window, said first generally c-shaped opening having a first perimeter, said first perimeter being coincident with said first securing means, said second generally c-shaped opening having a second perimeter, said second perimeter being coincident with said second securing means, whereby, said first element and said second element are secured to the outer passenger window frame and coact with each other to form a protective barrier about the aircraft window to prevent damage to the exterior of the aircraft during routine aircraft window maintenance.

5,462,244

SYSTEM FOR DETECTING TRAINS

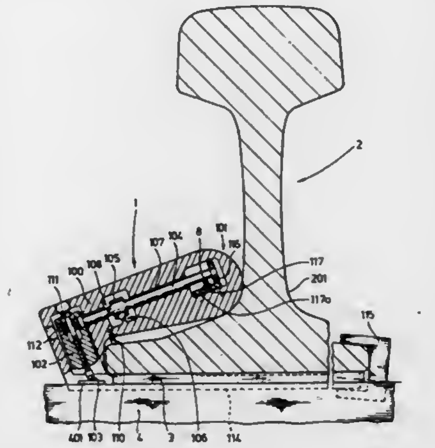
Marinus J. Van Der Hoek, Vlaardingen; Adolf H. K. Moor, Alkmaar; Anastasius J. A. Bruinsma, Delft; Jaap Roos, Pijnacker, and Jacobus C. Buisman, Alkmaar, all of, Netherlands, assignors to N.V. Nederlandse Spoorwegen, Utrecht, Netherlands

Filed Sep. 21, 1993, Ser. No. 124,040

Claims priority, application Netherlands, Sep. 25, 1992, 9201667

Int. Cl.⁶ B61L *23/04*

U.S. Cl. 246—122 R **19 Claims**

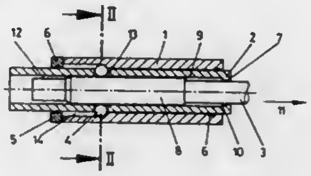


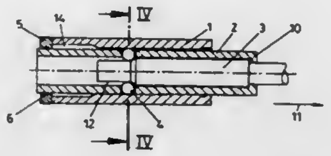
1. A system for detecting one or more vehicles on a rail track mounted on a fixed substructure, comprising at least one optical conductor extending near and parallel to the rail track with a light source and light detector coupled thereto, and at least one sensor coupled to the rail track and including the optical conductor, which sensor senses the light transmission in the optical conductor locally upon the presence of a vehicle,

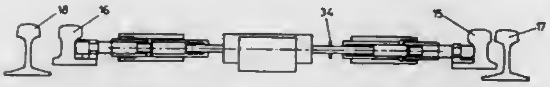
- wherein the sensor is incorporated in a sensor housing and includes a free elongated element, which is connected to the sensor housing via an elastic hinge connection, and
- wherein one end of the elongated element abuts against the optical conductor running through the sensor housing and the other end is subjected to displacement of the rail relative to the fixed substructure of the rail.

5,462,245
APPARATUS FOR LOCKING MOVEABLE SWITCH PARTS

Gerald Durchschlag, Zeltweg, Austria, assignor to VAE Eisenbahnststeme Aktiengesellschaft, Vienna, Austria
Filed Dec. 17, 1993, Ser. No. 168,256
Claims priority, application Austria, Dec. 17, 1992, 2507/92
Int. Cl.^{6} B61L *11/00*
U.S. Cl. 246—448 **11 Claims**







1. A railway switch-point lock for locking end positions of movable switch-point parts comprising:

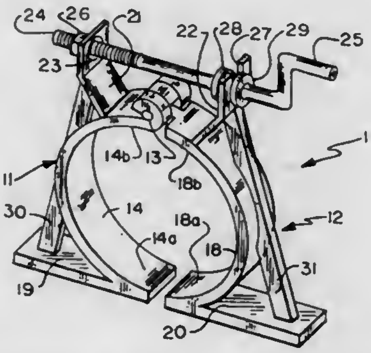
a fixed outer tube within which is housed in sealed relationship an inner tube surrounding a bolt, said tubes and the bolt having a common longitudinal axis said bolt having a length greater than each of said tubes;

locking means radially directed towards an inner surface of said outer tube for preventing longitudinal movement between said inner and outer tubes during an initial distance of movement of said bolt relative to said tubes; and

means for disabling said locking means when said bolt moves beyond said initial distance whereby the bolt and the inner tube move relative to the outer tube.

5,462,246
ANTI-ROTATION CLAMP FOR GATED IRRIGATION PIPE

Donald D. Schlenker, Meeteetse Rte., Burlington, Wyo. 82411
Filed Oct. 27, 1993, Ser. No. 141,522
Int. Cl.^{6} F16L *1/04*
U.S. Cl. 248—49 **7 Claims**



1. An anti-rotation pipe clamp for use with a section of gated irrigation pipe, comprising:

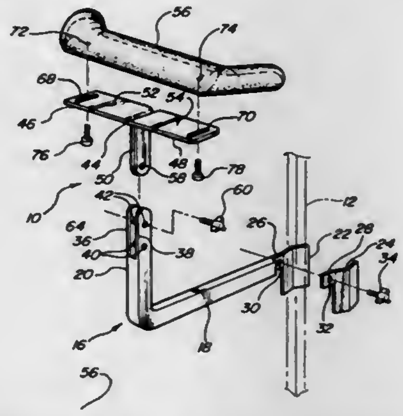
(a) A pair of base means, said pair of base means adapted for placement thereof upon a portion of the ground surface wherein said pair of base means include pivotal means for pivotally attaching each of said pair of base means together; and

(b) clamping means for securing said section of gated irrigation pipe thereto attached to said pair of base means wherein said clamping means includes arcuate surface means attached to each of said pair of base means, said arcuate surface means being adapted for receiving said section of gated irrigation pipe thereto and wherein said clamping means includes a crank adapted for cooperating with said pair of base means, wherein said crank is adapted to pivot one of said pair of base means with respect to another of said pair of base means as said crank is rotated;

whereby said clamping means is adapted for substantially preventing axial rotation of said section of gated irrigation pipe with respect to said pair of base means and wherein said section of gated pipe is supported by said anti-rotation pipe clamp and by said ground surface.

5,462,247
SUPPORT PAD FOR A STENOGRAPHER MACHINE

Stephen H. Aldrich, 5171 N. Five Mile Rd., Hope, Mich. 48628
Filed Aug. 29, 1994, Ser. No. 297,146
Int. Cl.^{6} B68G *5/00*
U.S. Cl. 248—118 **12 Claims**



1. An adjustable support for use with a stenographic machine, comprising:

a bracket for mounting to a support of the stenographic machine, said bracket having a horizontal member and a vertical member extending from said horizontal member;

means for mounting said horizontal member to be vertically adjustable along the support for the stenographic machine;

a support pad which is mounted upon a pad support plate; means for horizontally adjusting said support pad relative to said pad support plate; and

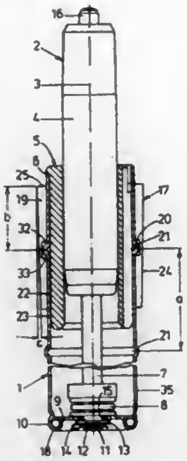
means for rotationally mounting said pad support plate to said vertical member of said bracket to permit said pad to be rotated relative to the stenographic machine.

5,462,248
LONGITUDINALLY ADJUSTABLE COLUMN FOR CHAIRS, TABLES OR THE LIKE

Jürgen Bauer, Altdorf, Germany, assignor to Suspa Compart Aktiengesellschaft, Altdorf, Germany
Filed Jul. 21, 1994, Ser. No. 277,272
Claims priority, application Germany, Sep. 2, 1993, 43 29 611.4
Int. Cl.^{6} A47C *3/30;* **A47B** *9/10;* **F16F** *9/02*
U.S. Cl. 248—161 **9 Claims**

1. A longitudinally adjustable column (37) for chairs, tables comprising:

a stand pipe (1, 1', 1",) with a central longitudinal axis (3), with an external side (23) and with at least two projections (21, 34) which are—related to the central longitudinal axis (3)—

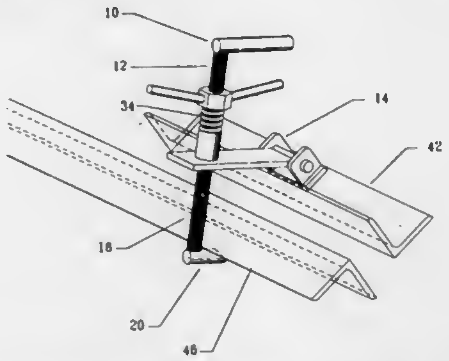


arranged at a distance from each other and extend outward from said external side (23),

one of a pneumatic or hydropneumatic length-adjusting element (2) arranged concentrically with the central longitudinal axis (3) within the standpipe (1, 1', 1'), with an end Of the length-adjusting element (21) engaged to a lower end of the stand pipe and

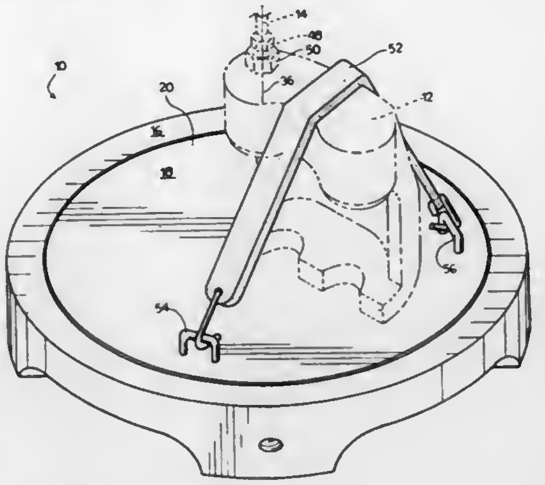
a sleeve-like cone section (17) with an external conical surface (24) and with an internal side (22) removably engaged on the external side (23) of the stand pipe (1, 1', 1'') and with at least one recess (20, 30, 31) engageable with one of said at least two projections (21, 34).

5,462,249
CLAMP FOR SECURING TRAILER RAMP IN TRANSPORT POSITION
Ronald J. Calzone, HCR 60, Box 296, Dixon, Mo. 65459
Filed Jan. 25, 1994, Ser. No. 186,675
Int. Cl.^{6} E01D *1/00*
U.S. Cl. 248—316.7 **15 Claims**



1. A pivotable clamp for securing a first member against a second member in an adjacent planar membership, said clamp comprising an arm member and a pivot bar member, said arm member comprising an elongated shaft member having a handle member at one end thereof, and a claw member at a second end thereof, said pivot bar member comprising an anchor bracket and a strap member pivotally connected to said anchor bracket, said anchor bracket having means for connection to a surface of said first member, said strap member having an opening to transversely receive said shaft member in a rotating relationship, whereby said claw member is rotatably movable in relation to rotation of said handle member, said claw member having means for bearing against said second member to secure said first and second members together, means being provided to brace said shaft member against passive loosening movement.

5,462,250
BRAKE CALIPER TOOL
Cedric H. Fells, 1815 Garfield, Little Rock, Ark. 72204
Filed Mar. 14, 1994, Ser. No. 212,042
Int. Cl.^{6} A47B *91/00*
U.S. Cl. 248—371 **7 Claims**



1. A device utilized for removing a brake caliper from a brake line, comprising:

a housing having a substantially circular recess portion and a bore therein;

a substantially circular plate supported within said circular recess portion of said housing, said plate being rotatable about an axis, and having a first surface and a second surface;

means for securing said housing and said plate together, said means for securing said housing and said plate together including a shaft provided on said second surface of said plate and extending along said axis of rotation of said plate for placement within said bore to facilitate rotation of said plate about said axis; and

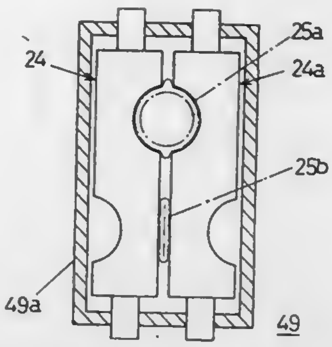
means for temporarily securing the brake caliper to said first surface of said plate, said means for temporarily securing comprising a pair of latches secured to said first surface, said pair of latches being sufficiently spaced form each other to allow placement of the brake caliper therebetween, and a cord for placement over the brake caliper, said cord being secured to each latch of said pair of latches when a brake caliper is being held by said means for temporarily securing for removing the brake caliper from the brake line.

5,462,251
METHOD AND APPARATUS FOR CONTROLLING THE FLOW OF FLUIDS
Ryu Kawabe, 3-7-301, Nagayama 3-chome, Tama-shi, Tokyo 206, Japan
Division of Ser. No. 940,374, Sep. 3, 1992, Pat. No. 5,372,350. This application Jan. 7, 1994, Ser. No. 178,893
Claims priority, application Japan, Sep. 3, 1991, 3-250353; Jul. 28, 1992, 4-220617
Int. Cl.^{6} F16K *7/04*
U.S. Cl. 251—4 **13 Claims**

1. An apparatus for controlling the flow rate of a fluid flowing through a fluid path at least partially defined by a resiliently deformable conduit portion, comprising:

a casing having said resiliently deformable conduit portion extending therethrough;

a first roller and a second roller both rotatably supported in said casing by respective rotary shafts located along respective longitudinal axes of said first and second rollers in said casing, said first roller and said second roller having said resiliently deformable conduit portion therebetween; and



a control surface defined on said first roller for pressing said resiliently deformable conduit portion toward said second roller to control fluid flow through said conduit portion, said control surface comprising a first surface portion that is curved as viewed in section, the section being taken perpendicular to said rotary shaft of said first roller, and said first surface portion engaging and closing said resiliently deformable conduit portion in a closed position of said first roller, and a second surface portion that is curved as viewed in section, the section being taken perpendicular to said rotary shaft of said first roller, said second surface portion being positioned along one side of said resiliently deformable conduit portion in an open position of said first roller;

wherein said first and second surface portions of said control surface of said first roller are located at the same axial position along said first roller, and wherein said first and second surface portions are at least partially located at different radial distances from said longitudinal axis of said first roller;

wherein said first roller has a plurality of said control surfaces thereon; and

wherein said second roller is symmetrical with respect to said first roller, said second roller being rotatably mounted in said casing parallel to said first roller.

5,462,252
SPILL VALVE FOR A FUEL PUMP

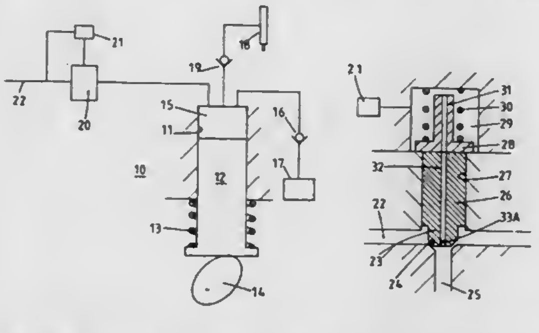
Gerald S. Thomas, Gloucester, England, assignor to Lucas Industries plc, England

Filed Dec. 8, 1993, Ser. No. 164,231

Claims priority, application United Kingdom, Dec. 8, 1992, 9225584

Int. Cl.⁶ F16K *31/122;* F02M *39/00*

U.S. Cl. 251—25 **6 Claims**



1. A spill valve for use in a fuel injection pump of the kind which is intended to supply fuel to an internal combustion engine, the spill valve controlling the escape of fuel from a pumping chamber of the pump thereby to control the start and finish of fuel delivery to the engine, the spill valve comprising a valve surface movable into engagement with a seating surface to prevent escape of fuel from the pumping chamber, a piston member defining the valve surface and valve means for controlling the pressure applied to the piston member, said valve means comprising a two position valve which in one setting causes the application of fluid under pressure to said piston member to move the valve surface into engagement with the seating surface and in its other setting allowing the valve surface to be moved away from the seating surface by the pressure of fuel in the pumping chamber, the spill valve further including movable stop means operable in a first position to limit the extent of movement of the valve surface away from the seating surface, said stop means being movable away from said first position towards a second position to allow further movement of the valve surface away from the seating surface when the pressure of fuel in the pumping chamber exceeds a predetermined value.

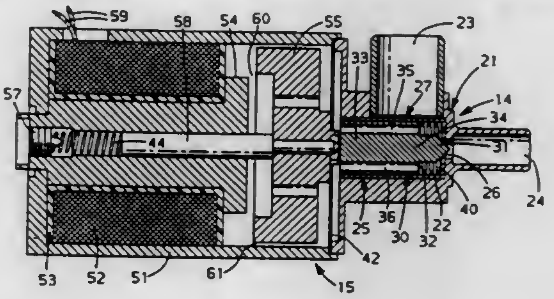
5,462,253
DUAL SLOPE FLOW CONTROL VALVE

Anjan Asthana, Philadelphia, Pa.; James P. Henry, Indianapolis, and Melissa A. Hamilton, Anderson, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Jul. 22, 1994, Ser. No. 279,139

Int. Cl.⁶ F16K *31/06*

U.S. Cl. 251—121 **12 Claims**



1. A flow control valve selectively openable to permit an amount of flow through a normally closed flow path, the flow control valve comprising:

a valve housing having an inlet, an outlet and defining a segment of the flow path therebetween;

a seat orifice in the flow path between the inlet and the outlet;

a T-slot orifice having a longitudinal leg and a transverse leg in the flow path between the inlet and the outlet;

a sliding poppet having a body and a tip positioned in the valve housing, the sliding poppet slidable to selectively open the normally closed flow path wherein the poppet body co-acts with the T-slot orifice and the poppet tip co-acts with the seat orifice to determine the amount the flow path is selectively opened wherein the poppet body initially opens the longitudinal leg and secondarily opens the transverse leg upon sliding open.

5,462,254
BULK MATERIAL CONTAINER HAVING A BOTTOM OUTLET VALVE

Josef Müller, Frankfurt am Main, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed May 3, 1994, Ser. No. 237,214

Claims priority, application Germany, May 5, 1993, 43 14 794.1

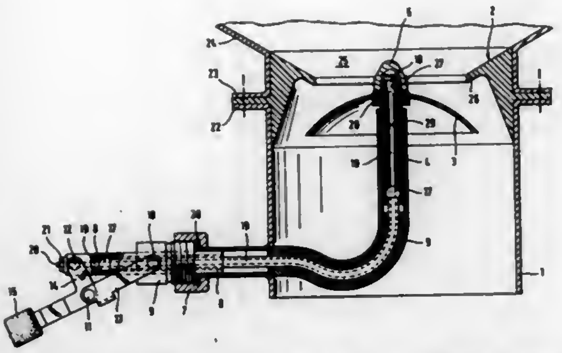
Int. Cl.⁶ F16K *31/46*

U.S. Cl. 251—144 **4 Claims**

1. A bulk material container having a bottom outlet in communication with a conductor tube, the container comprising:

a housing for containing bulk material, including a conically-shaped bottom outlet;

a valve for controlling the movement of bulk material from the housing into the conductor tube, the valve including a conically-shaped valve seat adjacent the bottom outlet and a valve element, having a substantially convex upper surface, cooperating with the valve seat; and



an actuator for selectively engaging the valve element with the valve seat, including a guide sleeve, a guide pin connected to the valve element and having a portion slidably disposed within the guide sleeve, a flexible shaft movable within the guide sleeve and having a proximal end connected to the guide pin and a distal end, a cable disposed within the flexible shaft and connected to the guide pin, and a lever connected to the distal end of the flexible shaft for moving the flexible shaft and cable relative to the guide sleeve, the lever moving the valve element between a seated, closed position and an unseated, open position.

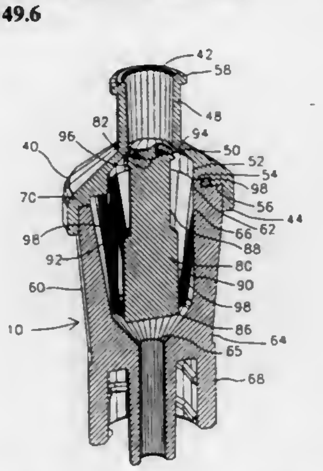
5,462,255
AUTOMATIC FLUID CONTROL VALVE

Jonathan J. Rosen, Alpharetta, and Charles E. Larsen, Cumming, both of Ga., assignors to Novoste Corporation, Norcross, Ga.

Continuation-in-part of Ser. No. 154,944, Nov. 19, 1993. This application Mar. 25, 1994, Ser. No. 217,672

Int. Cl.⁶ F16L *37/28*

U.S. Cl. 251—149.6 **34 Claims**



1. An automatic fluid control valve, comprising:

a first rigid tube member having a top and a first portion containing a first passageway having a diameter and defining a secondary valve sealing surface and having a second portion defining a second passageway having a diameter greater than said first passageway, a transitional inner wall between said first and second passageways defining a tapered primary valve sealing surface;

a second rigid tube member having an inner passageway defined therein and at least one first projection extending therefrom, said first and second tube members capable of mating engagement with axial alignment;

a cylindrical valve element having upper and lower portions and a top surface, said upper portion having a narrower diameter than said lower portion, a deformable shaped valve shoulder defined between said upper and lower portions, at least one annular deformable flange disposed proximate to said top surface, said at least one flange and said upper portion of said valve element being slidingly receivable within said first passageway such that said at least one flange deformably engages said secondary valve sealing surface; and

a plurality of elastic members extending from said lower portion of said valve element such that when assembled said elastic members are maintained in elastic deformable engagement with said second tube member,

whereby said shoulder of said valve element is capable of being releasably maintained in compressive engagement with said valve sealing surface by said elastic members so as to prevent passage of fluid therethrough.

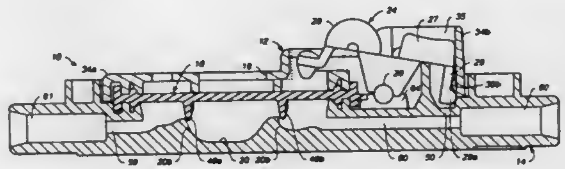
5,462,256
PUSH BUTTON FLOW STOP USEABLE WITH A DISPOSABLE INFUSION PUMPING CHAMBER CASSETTE

Steven E. Minick, San Diego; Michael W. Lawless, Poway; Peter A. Soberon, Cardiff; Ashok Kaul, San Diego, and Robert A. Hermann, Chula Vista, all of Calif., assignors to Abbott Laboratories, Abbott Park, Ill.

Filed May 13, 1994, Ser. No. 242,761

Int. Cl.⁶ F04B *49/10*

U.S. Cl. 251—331 **5 Claims**



1. A flow stop mountable on a cassette, said cassette including a rigid base member and an upper member spaced from said base member to define a fluid flow path therebetween, said upper member including a flexible diaphragm mounted in said upper member in fluid tight relation thereto and adjacent said fluid flow path, said base member having upwardly extending protrusions therein to partially define a pumping chamber of the cassette, said diaphragm of said upper member having downwardly extending protrusions generally aligned with the upwardly extending protrusions of the base member to further define said pumping chamber, said base member protrusions and said upper member protrusions slightly displaced from each other to enable the flow path through the cassette, said flow stop including a switch body and a central shaft extending across the switch body to protrude on opposite sides thereof, said shaft mountable on the base member of the cassette to enable a rocking movement, a crown member disposed on the switch body to be placed adjacent the pumping chamber when the flow stop is mounted on the cassette, said switch body rockable about the shaft on an axis of the cassette between an open position enabling fluid flow through the cassette and an engaged position wherein the crown member is pushed downwardly to displace the diaphragm and drive at least one protrusion of said diaphragm into at least one protrusion of said base member to block the flow path and fluid flow through the cassette.

5,462,257
JACK STAND

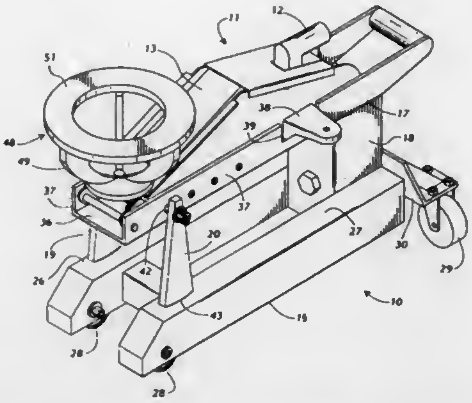
Larry G. Trowbridge, 632 Monroe Jackson Rd., Meigs, Ga. 31765

Filed Sep. 20, 1994, Ser. No. 309,080

Int. Cl.⁶ B66F *5/00*

U.S. Cl. 254—8 B **1 Claim**

1. A stand for supporting a jack in predetermined relation to an element of a machine disposed on a floor and having a machine part positioned between the floor and the machine element so as to block access to the element by a jack placed on the floor, the stand comprising:



- a pair of elongated base rails spaced apart from each other and interconnected at one end by a spacer member;
- at least one wheel associated with each base rail so as to support the base rail for selective movement on the floor;
- an upright support member mounted at the one end of the base rails and extending upwardly to an upper end a predetermined distance above the rails;
- an elongated support platform attached to the upper end of the support member so that the support member is maintained above the base to define a space sufficient to accommodate the machine part without interference from the support member when the base is placed in a predetermined position beneath the machine part;
- the support platform being configured to receive a jack in predetermined relation to the machine element when the base is so positioned;
- a pair of struts pivotably connected to the support platform in lateral spaced apart relation to the upright support member;
- the struts being spaced apart from each other so that each strut overlies one of the base rails;
- the struts extending downwardly from the support platform to engage the base rails so that the struts can transfer part of the weight of the jack, and of a machine element supported by the jack, to the base rails; and
- the pivotable connection permitting displacement of the struts so that the blocking machine part can enter the space between the base rails and the jack support platform and the struts thereafter can return to the weight transfer relation with the base rails.

5,462,258

ROAD CRASH BARRIER COMPRISING AT LEAST ONE HORIZONTAL WOODEN RAIL

Christian Gaillard, and Thierry Papineschi, both of Beziers, France, assignors to Compagnie Francaise des Etablissements Gaillard, Beziers, France

PCT No. PCT/FR92/00855, § 371 Date Mar. 21, 1994, § 102(e) Date Mar. 21, 1994, PCT Pub. No. WO93/07340, PCT Pub. Date Apr. 15, 1993

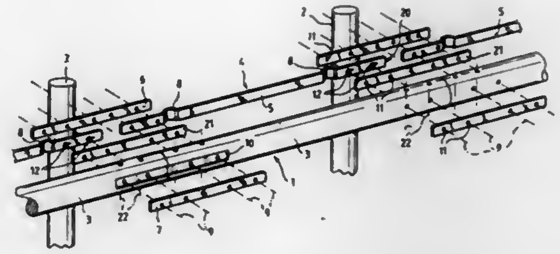
PCT Filed Sep. 11, 1992, Ser. No. 211,116

Claims priority, application France, Sep. 30, 1991, 91 12282

Int. Cl.⁶ A01K *3/00*

U.S. Cl. 256—13.1 **10 Claims**

1. A road crash barrier comprising at least one horizontal rail having wooden elements that are assembled end to end and that are supported by posts, the rail being covered over a portion of its surface with a continuous metal strip, the strip having elongate plane rectangular plates of small section that are fixed against a surface of the rail facing away from a road traffic axis, the rectangular plates lying in a horizontal plane that includes the axis of the rail, at least one of said rectangular plates having at least one deformation zone capable of enabling each length of the strip corresponding to an associated wooden element to lengthen by a certain amount.



5,462,259

TILTING DEVICE FOR A D.C. ARC FURNACE AND PROCESS FOR EMPTYING THE FURNACE

Heinz Guido, Duisburg, Germany, assignor to Man Gutehoffnungshutte Aktiengesellschaft, Oberhausen, Germany

PCT No. PCT/EP93/03596, § 371 Date Aug. 23, 1994, § 102(e) Date Aug. 23, 1994, PCT Pub. No. WO94/14983, PCT Pub. Date Jul. 7, 1994

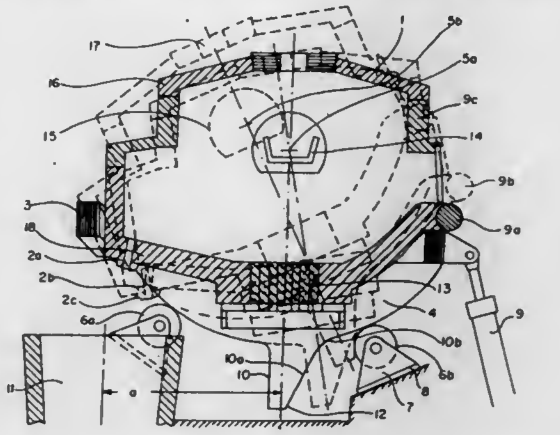
PCT Filed Dec. 17, 1993, Ser. No. 290,955

Claims priority, application Germany, Dec. 24, 1992, 42 44 228.1

Int. Cl.⁶ C21C *5/52*

U.S. Cl. 266—45 **7 Claims**

1. A tilting device for a direct current arc furnace, the furnace having an eccentric bottom tap hole and having electrodes following a tilting movement of the furnace, the furnace having a furnace vessel with a lateral opening and a device for continuously introducing scrap iron, the tilting device comprising: rolling cradles arranged under said vessel frame, said rolling cradles being provided with a cam on an underside; rollers arranged rigidly on a base frame of a furnace foundation, said rolling cradles having contact points with said rollers in a defined tilting range between ±5° and ±15°, said rolling cradles having a shape of an arc, with a radius originating from a rolling center of said furnace vessel, outside of said defined tilting range, said arc shape of said rolling cradles pass into a cam rolling surface portion, in an area of said cam, said cam rolling surface portion having a slope relative to a tangent to said arc of said rolling cradle which is selected to define cam means which substantially maintains the position of said bottom tap hole of said furnace vessel constant during a rolling of said rolling cradle over said cam rolling surface; and hydraulic power drive means, connected to said furnace vessel, for moving said furnace vessel, said hydraulic power drive means including a tilting cylinder.



5,462,260

DEVICE FOR INSERTING A LANCE INTO A PRESSURIZED CONTAINER, IN PARTICULAR A BLAST FURNACE

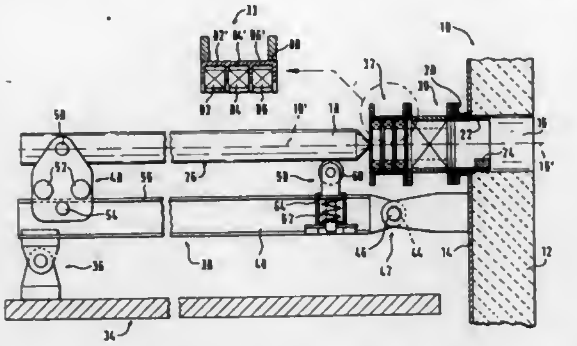
Emile Lonardi, Bascharage; Radomir Andonov, Mamer, and Giovanni Cimenti, Fentange, all of, Luxembourg, assignors to Paul Wurth S.A., Luxembourg

Filed May 26, 1994, Ser. No. 250,752

Claims priority, application Luxembourg, May 27, 1993, 88279

Int. Cl.^{6} C21B *7/24*

U.S. Cl. 266—226 **9 Claims**



1. A device for inserting, from a support structure, a lance axially through a side opening in a pressurized container, comprising:

- a support bench for the lance bearing with its rear end on the support structure and extending towards the side opening;
- a support carriage for the lance, which can slide along the support bench and in which the rear end of the lance is articulated;
- a sealing member and a closure member which are mounted on the pressurized container at the level of the side opening, said sealing member being adapted for interaction with the lance in order to ensure leaktightness around the lance when it is inserted therein, and said closure member being adapted to close the side opening when the lance is withdrawn;
- a front support for the lance which is arranged in proximity to said sealing member;
- an inner support for the lance which is arranged on the inner side of the pressurized container; and
- wherein said front support for the lance is an elastic support which is gradually pressed down under the weight of the lance, as the latter is inserted into said pressurized container, and which is mounted so as to follow the level variations of the side opening.

5,462,261

SWITCHABLE HYDRAULICALLY DAMPING MOUNT

Hans-Gerd Eckel, Laudenbach; Anja Kunkel, Siedelsbrunn, and Michael Müller, Darmstadt, all of, Germany, assignors to Firma Carl Freudenberg, Weinheim, Germany

Filed Sep. 9, 1994, Ser. No. 303,856

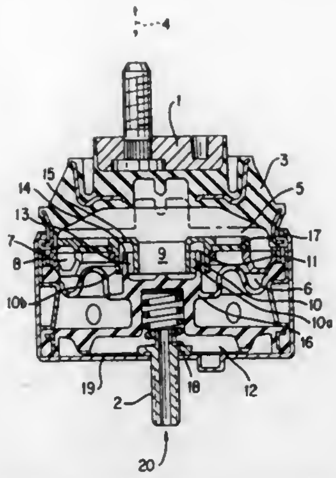
Claims priority, application Germany, Sep. 9, 1993, 43 30 560.1

Int. Cl.^{6} F16F *5/00*

U.S. Cl. 267—140.13 **10 Claims**

1. A switchable hydraulically damping mount, comprising:

- a supporting mount;
- a supported mount;
- a support spring made of an elastomeric material, said supporting mount and said supported mount being resiliently connected to one another by said support spring;
- a partition comprising at least one damping channel and a central recess, said central recess defining a portion of a passthrough opening, said partition comprising at least one annular, axial projection;



- at least two working chambers filled with a fluid, said working chambers being arranged in a direction of vibrations introduced into said mount during operation, said chambers being delimited on sides facing one another by said partition, said chambers being connected in a fluid-conveying manner to one another by said at least one damping channel;
- an actuator, said actuator comprising at least one annular, axial projection, said passthrough opening being opened by said actuator, said actuator being acted on by a pressure medium, said actuator and said partition defining portions of said passthrough opening, said passthrough opening having a meander-shaped cross section in a radial direction, said at least one projection of said partition and said at least one projection of said actuator defining a portion of said passthrough opening.

5,462,262

HYDRAULIC ANTIVIBRATION DEVICES

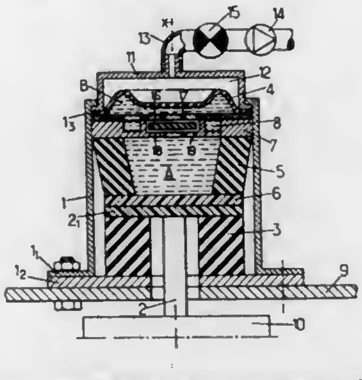
André Gennesseaux, Chateaudun, France, assignor to Hutchinson, Paris, France

Filed Nov. 10, 1994, Ser. No. 337,117

Claims priority, application France, Dec. 2, 1993, 93 14458

Int. Cl.^{6} F16M *3/00;* **F16F** *7/00*

U.S. Cl. 267—140.13 **10 Claims**



1. A hydraulic antivibration device designed to be interposed between two rigid elements, the structure of the device being circularly symmetrical about a vertical axis and the device comprising: an annular rigid strength member and a rigid rod passing through said strength member, the strength member and the rod being suitable for being secured respectively to the two rigid elements that are to be united; an annular spring of elastomer that withstands axial compression, resting against the strength member and the rod which passes through the spring; a leakproof flexible upper membrane carried by the strength member and co-operating with at least one leakproof flexible annular wall to define an enclosure disposed above the spring; an intermediate rigid partition carried by the strength member, extending between the membrane

and the annular wall and subdividing the inside of the enclosure into two chambers, a working bottom chamber on the side of the spring, and a compensation chamber; a narrow passage putting the two chambers permanently into communication with each other; a mass of liquid filling the two chambers and the narrow passage; a first disk secured to the base of the annular wall; and a second disk secured to the head of the rod, the second disk being disposed immediately beneath the first disk and resting on the spring; the device being characterized in that it comprises control means for causing at will the two disks to move apart axially and subsequently to come back into contact.

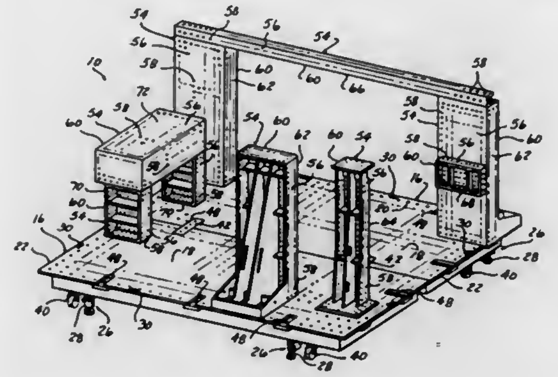
5,462,263
MODULAR TOOLING SYSTEM FOR DIE MODEL VERIFICATION

Richard A. Feltrin, Ray, Mich., assignor to Prototype Systems, Inc., Warren, Mich.

Filed Aug. 20, 1993, Ser. No. 110,056

Int. Cl.^{6} B23Q *3/00*

U.S. Cl. 269—69 **19 Claims**



1. A modular model verification mounting system for building and verifying a production tooling verification model with a surface contour made of a workable material comprising:

a plurality of preforms formed of workable material, each preform having an individual profile formed thereon;

reusable means for accurately registering said plurality of preforms relative to one another for verifying dimensional fit and finish of said individual profiles with respect to one another, said registered plurality of preforms defining an automotive body line with respect to a coordinate measuring system, wherein said reusable means further includes first and second planar base means for supporting said production tooling verification model, each planar base means having a first uniform grid of apertures disposed at a first predetermined distance from one another on a first planar surface, each of said first grid of apertures having threaded portions disposed spaced from said first planar surface by an enlarged diameter counterbore;

tie bar means for connecting said first and second planar base means to one another with said first planar surfaces coplanar with respect to one another;

at least one component means for attaching to said base means in cooperation with said first grid of apertures, said component means having a second uniform grid of apertures disposed at a second predetermined distance from one another, each of said second grid of apertures formed as through bores, said second distance equal to one-half said first distance; and

at least one armature means for connecting to said component means in cooperation with said second grid of apertures, said armature means having at least one surface adapted to support said workable material.

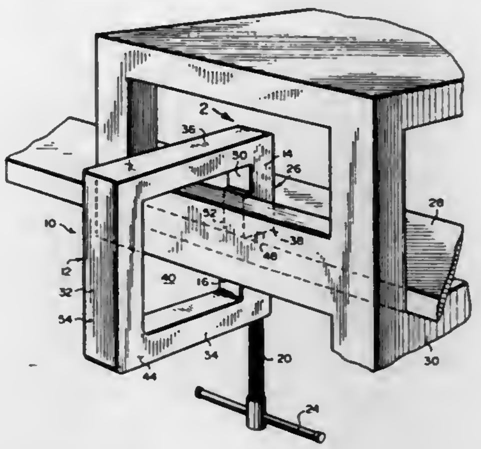
5,462,264
G-CLAMP

Joseph Delagera, 139 W. Ave., Hicksville, N.Y. 11801

Filed Oct. 11, 1994, Ser. No. 320,669

Int. Cl.^{6} B25B *1/10*

U.S. Cl. 269—249 **1 Claim**



1. A G-clamp comprising:

a) a frame having a fixed jaw at a first end, a sleeve with an internally threaded bore at a second end, an elongate base member, a first arm extending at a right angle from a first side of said elongate base member, said sleeve extending at a right angle from a distal end of arm and parallel with said elongate base member, a second arm extending at a right angle from a second side of said elongate base member and said fixed jaw located at the end of an extension piece extending at a right angle from a distal end of said second arm, parallel with said elongate base member and facing towards said sleeve and having a first bearing surface facing said sleeve.;

b) an operating screw extending through said internally threaded bore of said sleeve;

c) a moveable jaw comprising a ball joint swivel head mounted on a first side of said operating screw opposite from said fixed jaw on said frame;

d) a handle mounted transversely in a sliding manner through a second side of said operating screw, so as to rotate said operating screw;

e) an inner set back on said extension piece in the direction of said base member having a second bearing surface perpendicular to said first bearing surface facing said base member; and

f) said frame being square shaped in cross section, with said elongate base member, said first arm, said sleeve, said second arm, said fixed jaw and said extension piece all having completely flat outer sides, thereby permitting said frame to stand or lay flat unsupported on a horizontal surface on any side other than the side where said operating screw extends outwardly from said frame.

5,462,265
VARIABLE FORCE SHEETS OR SET EJECTOR

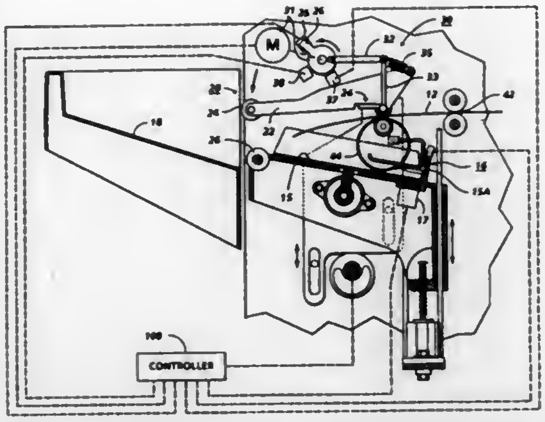
Barry P. Mandel, Fairport; Suzzette S. Resto, Victor; Charles D. Rizzolo, Rochester; Frederick A. Green, Fairport; Richard A. Van Dongen, Newark, and Phillip A. Billings, Fairport, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 7, 1994, Ser. No. 334,984

Int. Cl.^{6} B42B *2/02;* **B65H** *39/02;* **B65G** *57/00*

U.S. Cl. 270—53 **9 Claims**

1. In an output sheet handling system for a reproduction apparatus, for selective stacking of the output sheets into at least one stacking tray, with a sheet ejection system for gripping and ejection of the output of the printed sheets from said reproduction apparatus



into said stacking tray sequentially as individual output sheets or as a compiled stack of plural output sheets, the improvement wherein said sheet ejection system includes an automatic variable normal force system automatically providing a substantially higher gripping normal force for said ejection of said compiled stack of plural output sheets than for said ejection of said individual output sheets.

5,462,266
PROCESS AND APPARATUS FOR OPENING FOLDED PRINTED PRODUCTS

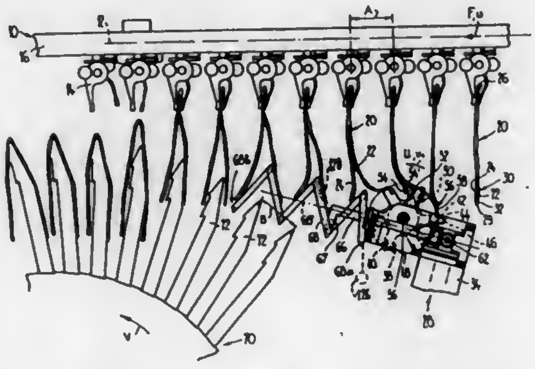
Jacques Meier, Bäretswil, Switzerland, assignor to Ferag AG, Switzerland

Filed Dec. 1, 1993, Ser. No. 160,386

Claims priority, application Switzerland, Dec. 4, 1992, 03724/92

Int. Cl.^{6} B65H *39/02;29/04*

U.S. Cl. 270—54 **26 Claims**



1. An apparatus for opening folded printed products having a first product part and a second product part joined at a fold, each of said product parts having a free end edge opposite the fold, the apparatus comprising:
   - a conveying device including a plurality of transport clips, the transport clips being driven in a conveying direction and each clip adapted to hold a printed product at the fold and extending transversely to the conveying direction;
   - a supporting element arranged underneath the conveying device for supporting the printed products in the region of their free ends as the products are conveyed; and
   - an opening unit adjacent the supporting element including a plurality of grippers driven in a circulating manner and each gripper adapted to seize the free edge of one of said product parts in each product;
   - said opening unit also including a stabbing element moveable relative to the grippers and effective to move between the product parts in each product and at least partially move the other part away from the one part whereby the printed product is opened.

5,462,267
FEEDING DEVICE

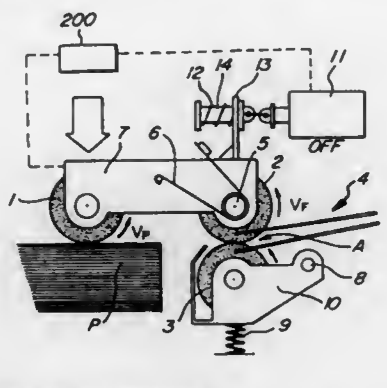
Haruhiko Hori, Toyokawa, Japan, assignor to Minolta Co., Ltd., Osaka, Japan

Filed Dec. 6, 1993, Ser. No. 163,660

Claims priority, application Japan, Dec. 7, 1992, 4-326528

Int. Cl.^{6} B65H *5/00*

U.S. Cl. 271—10.04 **9 Claims**



1. A feeding device comprising:
   - a feed roller which applies a pressure contact force to a sheet of paper and feeds the paper;
   - a drive shaft for driving said feed roller;
   - a transporting roller disposed downstream from said feed roller relative to a paper feeding direction for transporting the paper fed by said feed roller, wherein a speed at which the paper is transported by said transporting roller is faster than a speed at which the paper is initially fed by said feed roller;
   - a oneway clutch disposed between said drive shaft and said feed roller so as to allow said feed roller to rotate by a force of transportation of the paper when transported by said transporting roller; and
   - switching means for reducing the pressure contact force of said feed roller relative to the paper when said feed roller is rotated by the force of rotation of the paper transported by said transporting roller.

5,462,268
DEVICE FOR TEMPORARY STORAGE OF FLAT OBJECTS

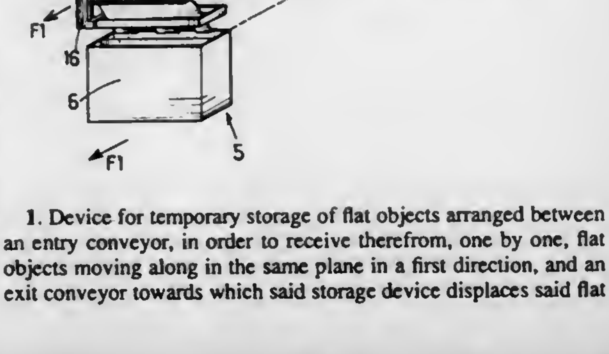
Jean-Luc A. M. Remy, Venelles; Jean Roch, Simiane Collongue, and Jean-Pierre Volat, Aix en Provence, all of, France, assignors to Bertin & Cie, Plaisir, France

Filed Jan. 13, 1994, Ser. No. 181,302

Claims priority, application France, Jan. 18, 1993, 93 00396

Int. Cl.^{6} B65H *5/00*

U.S. Cl. 271—225 **14 Claims**



1. Device for temporary storage of flat objects arranged between an entry conveyor, in order to receive therefrom, one by one, flat objects moving along in the same plane in a first direction, and an exit conveyor towards which said storage device displaces said flat

objects received from the entry conveyor one by one, in which said storage device comprises:

a reception conveyor comprising a plurality of receptacles movable over at least a part of their path in a second direction substantially orthogonal to said first direction, each receptacle being capable of receiving a flat object bearing in a position which is slightly inclined with respect to vertical, and

a stationary station for reception and stopping in a position which is slightly inclined with respect to vertical of said flat objects originating from said entry conveyor, said reception station being interposed in said part of the path and having a form matching that of said receptacles so that an object bearing on said reception station is transferred in said second direction bearing in one of said receptacles upon passage of the latter in the plane of said reception station.

5,462,269

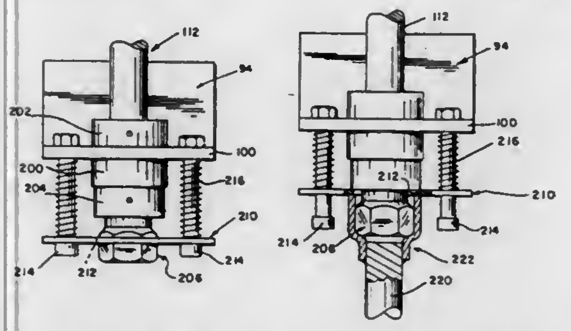
ADJUSTABLE BACKBOARD ASSEMBLY WITH DRIVE LOCK

Edward A. Schroeder, Marengo, and James Gallicchio, Schiller Park, both of Ill., assignors to Porter Athletic Equipment Company, Broadview, Ill.

Filed Mar. 21, 1994, Ser. No. 210,452

Int. Cl.⁶ A63B *63/08*

U.S. Cl. 273—15 R **8 Claims**



1. An adjustable backboard assembly for mounting a basketball backboard to a support comprising:

support mounting means for mounting said assembly to a support;

backboard mounting means for mounting a backboard to said assembly;

screw drive for adjusting the height of said backboard mounting means relative to said support mounting means;

an input on said screw drive for receiving a driver for operation of said screw drive;

an outer locking surface on said screw drive;

a locking plate having an aperture for mating with said outer locking surface and locking said screw drive;

a pair of guides passing through said locking plate for guiding the locking plate to move along the axis of the screw drive; and

automatic means for maintaining said locking surface mated in said aperture when said driver is detached from said input and for allowing said locking surface to exit said aperture when said driver is attached to said input.

5,462,270

Patent Not Issued For This Number

5,462,271

Patent Not Issued For This Number

5,462,272

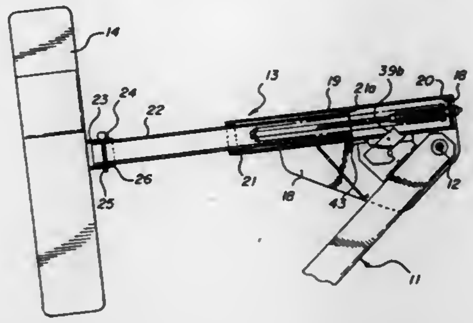
FOOTBALL TRAINING SLED

Kenneth E. Staten, Clare, Mich., assignor to Rogers Athletic Company, Clare, Mich.

Filed Oct. 12, 1994, Ser. No. 322,093

Int. Cl.⁶ A63B *67/00*

U.S. Cl. 273—55 R **11 Claims**



1. In a practice sled for use in training football players to perfect their blocking and block evading techniques:

a) a frame;

b) a forwardly extending arm structure mounted on said frame

c) a blocking pad assembly having a rearwardly extending component telescopically mounted on said arm structure for rearward movement in a movement path relative thereto under the impetus of a player forcing the blocking pad assembly rearwardly;

d) a yieldable force resisting device connected to resist rearward movement of said blocking pad assembly;

e) a mount connecting said arm structure to said frame for movement relative thereto to permit said blocking pad assembly to raise and Lower with movement of said arm structure relative to said frame; and

f) restraining mechanism operable when said blocking pad assembly is in forward position to prevent the player from moving said arm structure to raise said blocking pad assembly until said blocking pad assembly has moved a predetermined distance rearwardly on said arm structure.

5,462,273

VARIABLE WEIGHT PLAYBALL

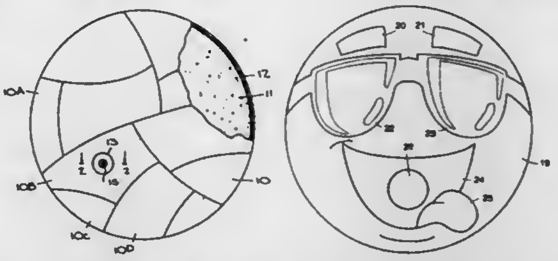
Donald Spector, 380 Mountain Rd., Union City, N.J. 07080

Continuation-in-part of Ser. No. 743,279, Aug. 9, 1991, Pat. No. 5,335,907, which is a continuation-in-part of Ser. No. 345,405, May 1, 1989, Pat. No. 5,138,721, which is a continuation-in-part of Ser. No. 205,477, Jun. 13, 1988, Pat. No. 4,834,382. This application Jul. 28, 1994, Ser. No. 281,937

The portion of the term of this patent subsequent to Aug. 9, 2011, has been disclaimed.

Int. Cl.⁶ A63B *39/00;43/00*

U.S. Cl. 273—58 H **9 Claims**



1. A variable weight, squeezable playball whose heft is determined by the player, the ball comprising:

A. an outer casing formed of liquid-impervious, flexible material, the casing having a configuration that depends on the game for which the playball is intended;

B. a low-density compressible body confined within the casing and conforming thereto, said body being formed of sponge-like material capable of absorbing water; and

C. a port formed in the casing to provide access to the body encased therein and a removable stopper for said port whereby water may be introduced through the port when the stopper is removed therefrom and the playball is then squeezed by the player, the water being absorbed by the body as the body resumes its normal configuration after which the port is closed by the stopper to retain the water and the playball is then in condition for play.

5,462,274
TENNIS RACKET WITH LONGITUDINAL STRINGS DIFFERENT IN TENSILE FORCE FROM TRANSVERSAL STRINGS

Masanori Takatsuka, Shizuoka, Japan, assignor to Yamaha Corporation, Japan

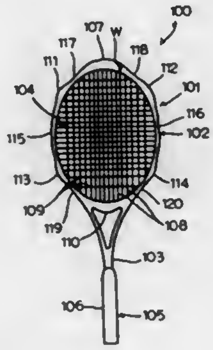
Filed Mar. 8, 1994, Ser. No. 207,948

Claims priority, application Japan, Mar. 9, 1993, 5-072893; Jan. 29, 1993, 5-294526

The portion of the term of this patent subsequent to May 10, 2011, has been disclaimed.

Int. Cl.^{6} A63B *49/02*

U.S. Cl. 273—23 C **11 Claims**



1. A tennis racket comprising:

a) a racket frame having a shaft portion for allowing a player to grip on a grip end thereof and a head portion providing a strung surface and merged into said head portion, said strung surface having a top end opposite to said grip end;

b) longitudinal strings stretched over said head portion in a longitudinal direction parallel to virtual line between said top end and said grip end; and

c) transversal strings stretched over said head portion in a transversal direction substantially perpendicular to said longitudinal direction for forming said strung surface together with said longitudinal strings, a ratio of a first tensile force exerted on each longitudinal string to a second tensile force exerted on each transversal string ranging from 2.5:1 to 4.0:1.

5,462,275
PLAYER INTERACTIVE LIVE ACTION FOOTBALL GAME

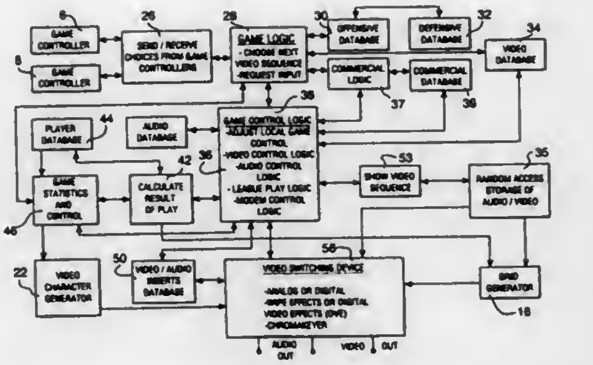
Danny D. Lowe, 37 Woodhaven View SW.; Gordon G. Wilson; Michael E. Baker, and Abram Gamer, all of Calgry, Canada, assignors to Gordon Wilson, and Danny D. Lowe, both of Calgary, Canada

Filed Dec. 20, 1991, Ser. No. 811,226

Int. Cl.^{6} A63F *9/00*

U.S. Cl. 273—94 **19 Claims**

1. A pre-recorded, live action and sound with electronically generated graphics overlay, full motion video, interactive athletic contest comprising players of opposite teams playing at various positions on a background field, the game comprising:



(a) a random access storage and retrieval means;

(b) said random access storage and retrieval means for storing a plurality of individual, pre-recorded video images representative of live action plays of the athletic contest illustrating interaction of players of the opposite teams;

(c) a microprocessor and microprocessor control means electronically associated with said random access storage and retrieval means for enabling one or more users to select in sequence through said control means different ones of said plays according to play type, the microprocessor then, by using statistical tables, to select the video image of the actual play according to play type selected by the user; and

(d) display means electronically associated with said microprocessor for enabling the selected plays to be viewed by the users;

(e) said microprocessor control means further programmed to evaluate and accumulate play results and to generate an image representative of a position on said background field, said position being determined in accordance With said play results, said microprocessor control means superimposing said position image on said live action image to form a composite image to be displayed upon said display means.

5,462,276
MOVEABLE ARM AND INSERTS FOR AMUSEMENT DEVICE

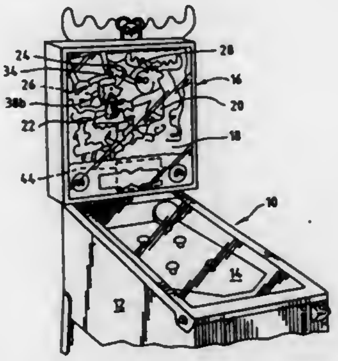
Joseph E. Kaminkow, 1304 Meade La., Arlington Heights, Ill. 60004

Division of Ser. No. 120,123, Sep. 10, 1993, Pat. No. 5,330,182. This application Mar. 31, 1994, Ser. No. 220,614

The portion of the term of this patent subsequent to Jul. 19, 2011, has been disclaimed.

Int. Cl.^{6} A63F *7/36*

U.S. Cl. 273—108 **5 Claims**



1. An amusement device having a playfield and a backboard display, said display comprising a display wall having a first image carried thereon plus a transparent display wall portion; a moveable arm positioned behind said transparent display wall portion, said arm being decorated to appear as part of said first image, whereby an illusion of image movement can be provided as the arm moves,

said arm being moveable in response to a predetermined event taking place on the playfield.

5,462,277

GAME MACHINE HAVING AN APPARATUS FOR SHOWING PRIZE AWARDING COMBINATIONS ON ROTATING DRUMS

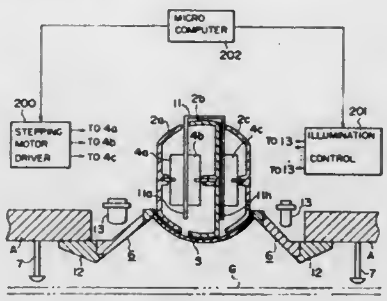
Takatoshi Takemoto, Tokyo, Japan, assignor to Kabushiki Kaisha Ace Denken, Japan

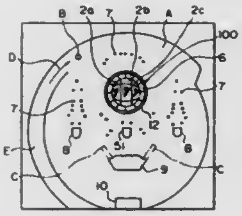
Filed Jul. 13, 1994, Ser. No. 274,493

Claims priority, application Japan, Jul. 15, 1993, 5-175021

Int. Cl.^{6} A63F *7/02;9/24*

U.S. Cl. 273—121 B **11 Claims**





6. A pachinko game machine including an apparatus having three rotating drums for showing prize awarding combinations of symbols, comprising:

a first rotating drum having an outer peripheral surface on which a plurality of symbols are shown and which is rotatable around an axis;

a second rotating drum having an outer peripheral surface on which said plurality of symbols are shown, which drum is positioned adjacent to another side of the first rotating drum and rotatably on said axis;

a third rotating drum having an outer peripheral surface on which said plurality of symbols are shown, which drum is positioned adjacent to another side of the first rotating drum and rotatably around said axis;

said first, second and third drums generally presenting, in combination together, a surface forming a part of a sphere; and

said apparatus for showing prize awarding combinations further comprising:

a rotation control means for independently controlling rotation and stopping of each of said first, second and third drums, such that said first, second and third drums start their rotations at the same time upon an occurrence of a predetermined event in said pachinko game machine and stop their rotations sequentially and automatically after a predetermined elapsed time;

a ring-shaped light transmitting illumination plate surrounding said first, second and third drum, said illumination plates having intermittently operable illuminating means; and

a flashing means for tuning on and off said illuminating means of said illumination plate, at a time when the first and second rotating drums having sequentially stopped after said first, second and third rotating drums started rotating and, if two symbols shown on the peripheral surfaces of the first and second rotating drums are the same.

5,462,278

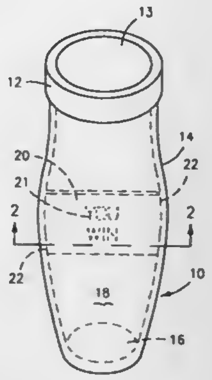
BLOW MOLDED PLASTIC CONTAINER INCLUDING AN INTERNAL WALL HAVING A VISUAL DISPLAY

Emery I. Valyi, Katonah, N.Y., assignor to Pepsico, Inc., Purchase, N.Y.

Continuation-in-part of Ser. No. 242,427, May 13, 1994. This application Aug. 29, 1994, Ser. No. 297,104

Int. Cl.^{6} A63F *9/00*

U.S. Cl. 273—138 R **22 Claims**



22. A game, comprising:

a blow molded plastic container as a game piece, comprising a wall having an inner and an outer surface, the wall defining a hollow space; and

at least one internal member extending across the hollow space, the at least one internal member having portions thereof which engage and are joined to the inner surface;

wherein the internal member includes means for displaying a pattern, wherein the means for displaying a pattern is distinguishable from the wall, wherein the pattern communicates the results of a game.

5,462,279

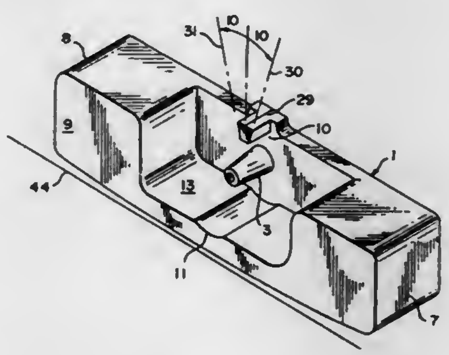
GOLF CLUB CAPABLE OF SELECTIVE ANGLE MODIFICATION BETWEEN THE HOSEL AND HEAD, AND SELECTIVE SHAFT LENGTH AND METHOD OF ASSEMBLING THE GOLF CLUB

Royce L. Culpepper, 1015 Normandy Dr., Clinton, Miss. 39056

Continuation-in-part of Ser. No. 314,447, Dec. 22, 1993, abandoned, which is a continuation-in-part of Ser. No. 835,526, Feb. 14, 1992, abandoned, which is a continuation-in-part of Ser. No. 624,344, Dec. 6, 1990, abandoned. This application Sep. 13, 1994, Ser. No. 305,388

Int. Cl.^{6} A63B *53/04*

U.S. Cl. 273—164.1 **14 Claims**



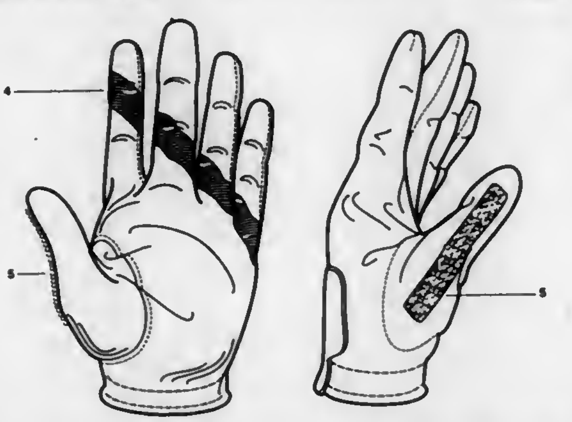
1. A golf club comprising:

a shaft and hosel assembly, said shaft defining a longitudinal shaft axis and said hosel including a first leg portion and a second leg portion integral with said first leg portion, said first leg portion defining a hosel axis parallel to and offset from said shaft axis and having a distal end with a first connection, said second leg portion connecting said first leg portion to said shaft; and

a head having a toe end, a heel end, a ground engaging surface, a rear side, a flat, ball-striking face extending between said toe end and said heel end and defining a first plane parallel to said shaft axis and said hosel axis, and a second connection for mating with said first connection to secure said head to said shaft and hosel assembly, said second connection extending perpendicular to said ball-striking face from a point on said rear side centered between said toe end and said heel end and defining an axis of rotation for said shaft in a second plane parallel to said first plane, said axis of rotation being perpendicular to said ball-striking surface, one of said first and second connections being a socket having a tapered cylindrical interior surface and the other of said first and second connections being a tapered pin having a tapered cylindrical exterior surface for mating with said interior surface, whereby said ball-striking face may remain perpendicular to the ground with rotation of said shaft in said second plane.

5,462,280
GOLF GRIP TRAINING DEVICE

Ralph T. Dickerson, 2994 Colorado Blvd., Denver, Colo. 80207
Filed Oct. 19, 1994, Ser. No. 325,615
Int. Cl.^{6} A63B *69/36;* A41D *19/00*
U.S. Cl. 273—187.2 **1 Claim**



1. A golf training device comprising a full golf glove used on the leading hand of the golf swing with a diagonal strip made of the same material as the glove but different color and sewn into the palm of said glove for the purpose of showing the exact placement of the golf club, and on the same glove of the leading hand, on the back of the thumb and running the length of the thumb, a strip of material carrying a plurality of hook like members; and on the other hand, a half glove, with fingers and thumb exposed is sewn a diagonal strip of felt like material; the two surfaces formed by the hook like members and felt like material being interlockingly engageable when matched up evenly in gripping a golf club, and showing the golf player the correct golf grip.

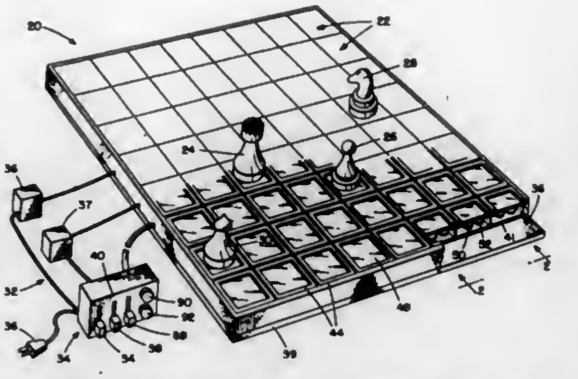
5,462,281
ELECTRIFIED BOARD GAME

Andre A. Gaito, 21 Laurel Hill Dr., and Donald C. Portofee, 12 Surrey La., both of Niantic, Conn. 06357
Filed Jun. 30, 1994, Ser. No. 268,495
Int. Cl.^{6} A63F *3/02*
U.S. Cl. 273—238 **15 Claims**

1. A board game comprising:

a playing board defining a plurality of playing positions;

a plurality of interactive playing pieces, each playing piece being movable between playing positions in accordance with

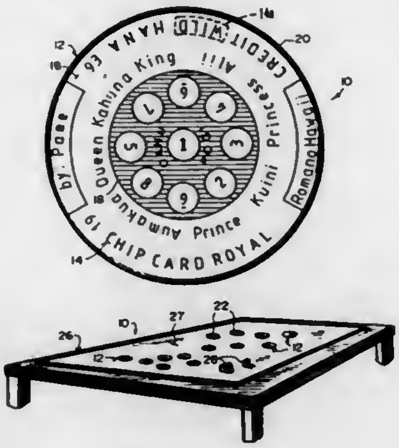


a predetermined pattern dependent upon its type, said predetermined pattern being influenced by the locations of other ones of said playing pieces; and

regulating means operable for selectively altering a sensible characteristic at each of said playing positions to thereby alter an attribute of a playing piece which lands on a certain one of said playing positions.

5,462,282
CREATIVE GAME

Pame A. M. L. C. Romano, P.O. Box 15953, Honolulu, Hi. 96830
Filed Mar. 21, 1994, Ser. No. 210,436
Int. Cl.^{6} A63F *3/00*
U.S. Cl. 273—240 **4 Claims**



1. A creative game which comprises:

a) a plurality of gaming chips;

b) identifiable indicia printed on one side of each said gaming chip, so that when said identifiable indicia is marked by a highlight color marker to indicate different value combinations, said gaming chips will become similar to playing cards to be utilized in playing games;

c) said identifiable indicia of different color to indicate different values on each said gaming chip including a central circle having a circle number "1" in the center with circled numbers "2", "3", "4", "5", "6", "7", "8", and "9" surrounding counterclockwise the number "1", whereby the number "6" and "9" are underlined so that they can be read in any direction, names of rulers of rank alternating in English and Hawaiian counterclockwise about said central circle being the words in English—"King", "Queen", "Prince", and "Princess", and the words in Hawaiian—"Kahuna", "Aumakue", "Kuini", and "Alinii", designations counterclockwise about the perimeter being the words "CHIP", "CARD", "ROYAL", "CREDIT", "WILD", and "HANA" (a Hawaiian word for work), so as to indicate different points;

d) a game board having a blank surface in which a plurality of said gaming chips can be randomly placed down upon said blank surface of said game board, whereby a predetermined amount of said gaming chips can be picked by each player and turned over face up to count the points indicated to determine the winner of the game;

e) a pair of dice used in conjunction with said game board, so that each player can determine by the roll of said pair of dice, how many times they may take in picking up said gaming chips; and

f) said game board including a plurality of circular spots printed on an opposite second surface in an end to end chain link random course, so that each player in turn can utilize one of said gaming chips to travel from a predetermined start position to a predetermined finish position on said circular spots along said chain link random course by the roll of said pair of dice, in which the winner is the first player to complete said chain link random course.

5,462,283
PROJECTILE DETECTION

John Allen, Portsmouth, England, assignor to Target Marketing Limited, Douglas, United Kingdom

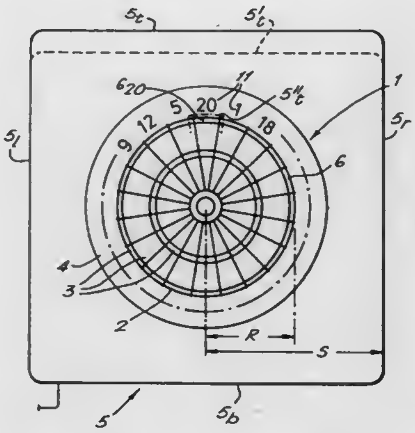
PCT No. PCT/GB93/01671, § 371 Date Feb. 10, 1995, § 102(e) Date Feb. 10, 1995, PCT Pub. No. WO94/04883, PCT Pub. Date Mar. 3, 1994

PCT Filed Aug. 6, 1993, Ser. No. 382,041

Claims priority, application United Kingdom, Aug. 11, 1992, 921690

Int. Cl.⁶ F41J *5/04*

U.S. Cl. 273—371 **20 Claims**



1. Apparatus for detecting embedding of an at least partially conductive projectile in a target and identifying its embedded position in the target, the apparatus comprising;

a target having a plurality of electrically conductive beds mutually insulated from each other and each having an identity,

means for determining the identity of any one of the beds having an at least partially conductive projectile embedded in and partially protruding from it,

an aerial associated with the target,

transmitting and receiving equipment connected to the beds and the aerial;

characterized in that the aerial is spaced from the beds by a separation of the order of magnitude of the size of the target.

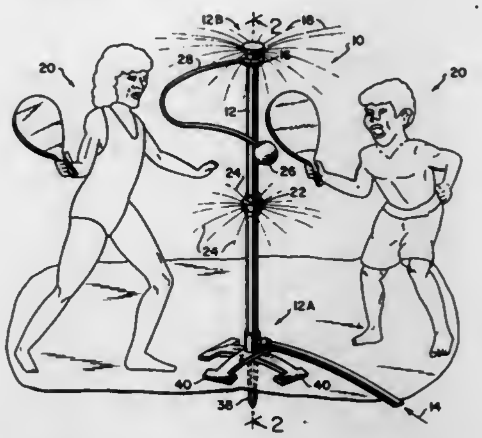
5,462,284
AMUSEMENT OUTDOOR WATER SPRAY

Gil Felsenthal, 100 Merrick Rd., Suite 504 West, Rockville Centre, N.Y. 11570

Filed Oct. 11, 1994, Ser. No. 320,647

Int. Cl.⁶ A63B *67/00*

U.S. Cl. 273—413 **2 Claims**



1. Improvements for an amusement outdoor water spray of a type using a vertical tube having at opposite bottom and top ends a source of water connected to said bottom end for delivering water in ascending movement though said vertical tube and a spray connected to said top end for causing a spray of water exiting therefrom, said improvements comprising a second spray connected in a medial location on said vertical tube for diverting water in a second spray exiting therefrom at said medial location, a ball, and a tether attached in extending relation from said ball connected at said vertical tube top end such that said ball is impinged upon by said second spray, whereby said second spray urges said tethered ball in erratic movements contributing to making a moving target thereof to correspondingly enhance the play value of said amusement water spray.

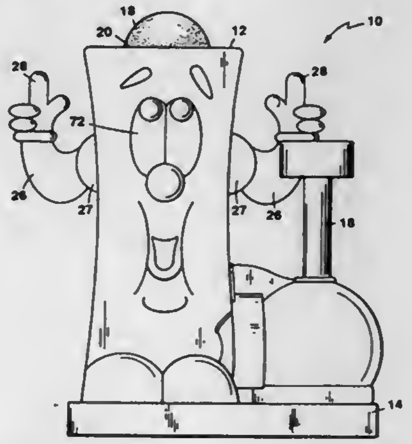
5,462,285
GAME WITH ANIMATED CHARACTER

Dennis J. O'Patka, 4742 N. Kenmore Ave., Chicago, Ill. 60604; Craig C. Williamson, 8113 W. 26th St., North Riverside, Ill. 60546; Burton C. Meyer, 9S641 Main St., Downers Grove, Ill. 60516, and John R. Wildman, 9545 N. Harding, Evanston, Ill. 60203

Filed Nov. 7, 1994, Ser. No. 337,183

Int. Cl.⁶ A63H *33/18*

U.S. Cl. 273—459 **20 Claims**



1. A game, comprising:

a manual actuator,

an animated character coupled to and animated by actuation of the manual actuator and including:

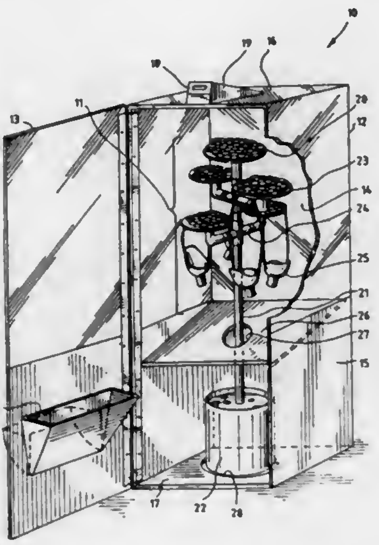
an ejector operable to generate pressurized air,

an object positioned in the ejector,

a mechanical counter coupled to and incremented by actuation of the manual actuator, and

a release mechanism coupled to and responsive to the mechanical counter to activate the ejector when the counter is incremented to a sufficient number and to thereby cause the ejector to generate pressurized air that ejects the object.

5,462,286
AMUSEMENT DEVICE
Edward Roberts, 473 Maple St., Weldon, Ill. 61882
Filed Jan. 24, 1995, Ser. No. 377,470
Int. Cl.⁶ A63F *9/00*
U.S. Cl. 273—459 5 Claims



1. An amusement device comprising:

(a) a cabinet having a front face, a back face, two side faces, and a top; the upper interior portion of the cabinet defining a playing area with a floor; at least one face of the cabinet having a transparent portion enabling the playing area to be seen from outside the front of the cabinet;

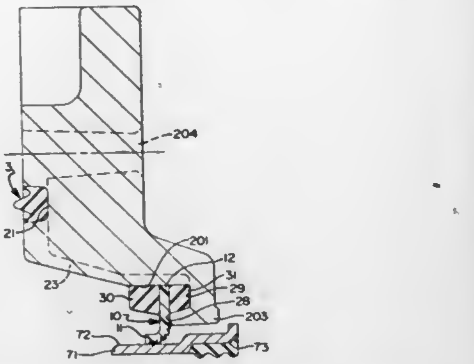
(b) a coin feeder above the playing area which allows only coins of a particular size to pass and to drop down into the playing area;

(c) at least one horizontal platform positioned in the playing area above the floor and under the coin feeder so that coins dropping down from the coin feeder land on the platform, accumulate in a random pile on the platform, and occasionally spill over the platform and land on the floor of the playing area;

(d) a means for discharging at least a portion of the coins landing on the floor of the playing area to the outside of the cabinet; and

(e) at least on cup suspended in a tilting orientation below a horizontal platform and above the floor, the cup being adapted to receive and hold coins dropping from the platform, the cup being further adapted to tilt over and spill the coins down onto the floor when the coins in cup reach a certain number.

5,462,287
METHOD FOR THE MANUFACTURE OF A SHAFT SEAL
Jürgen Hering, Sievershütten; Rolf Johnen, and Gerd Upper, both of Hoisdorf, Germany, assignors to Dichtungstechnik G. Bruss GmbH & Co. KG, Hoisdorf/Hamburg, Germany
Filed Mar. 11, 1994, Ser. No. 209,934
Claims priority, application European Pat. Off., Mar. 12, 1993, 93104037
Int. Cl.⁶ F16J *15/32*
U.S. Cl. 277—37 9 Claims



1. A seal assembly for sealing the end of a shaft extending through an end wall of a casing, as well as for sealing the casing end wall, the assembly comprising:

a gasket receptacle having a casing side, a groove formed in said casing side, a passage opening for a shaft, an annular recess located around the passage opening, a collar located adjacent the recess, and a connecting channel extending from the collar along the recess to the groove;

an annular plastic sealing disk having an inner radial portion located in the passage opening and having an outer radial portion secured to the receptacle;

an elastomeric static gasket located in the groove on the casing side for sealing the end wall of the casing;

the plastic sealing disk being mounted within the recess to the gasket receptacle by elastomer material defining a pair of elastomer rings;

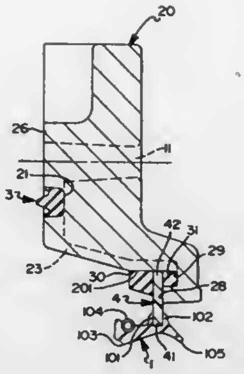
the plastic sealing disk being pressed from the casing side under radial and axial pressure in the recess and against the collar; and

the sealing rings being connected by the elastomer which extends axially over the plastic sealing disk via the connecting channel and into the groove on the casing side and thereby linking with and forming the static gasket, the rings being axially spaced and located on opposite side portions of the plastic sealing disk.

5,462,288
SHAFT SEAL ASSEMBLY
Jürgen Hering, Sievershütten; Rolf Johnen, and Gerd Upper, both of Hoisdorf, all of, Germany, assignors to Dichtungstechnik G. Bruss GmbH & Co. KG, Hoisdorf/Hamburg, Germany
Filed Mar. 11, 1994, Ser. No. 209,935
Claims priority, application European Pat. Off., Mar. 12, 1993, 93104036
Int. Cl.⁶ F16J *15/32*
U.S. Cl. 277—37 3 Claims

1. A seal assembly for sealing around a shaft which extends through an end wall of a casing and for sealing the end wall, the seal assembly comprising:

a cast metal gasket receptacle having a casing side, a groove formed in said casing side, a recess formed in said casing side and open toward said casing side, a connecting channel formed within said receptacle and extending between said



groove and said recess, a collar located adjacent said recess, and a shaft passage opening located adjacent said recess;

a prefabricated shaft seal ring unit disposed adjacent the shaft passage opening and comprising a metal ring having an inner radial portion and an outer radial portion, an elastomeric seal ring bonded to said inner radial portion, and said outer radial portion engaging said collar of said gasket receptacle, said seal ring unit being axially and radially pressed within said recess and against said collar;

a static elastomeric gasket located in the groove on the casing side of said receptacle for sealing the end wall of said casing;

a first elastomeric ring bonded to one side of said outer radial portion of said metal ring adjacent said collar and a second elastomeric ring bonded to an opposed side of said outer radial portion of said elastomeric ring; and

said first and second rings being axially spaced and interconnected by elastomeric material extending axially via said connecting channel over said outer radial portion of said metal ring and linked to said static gasket.

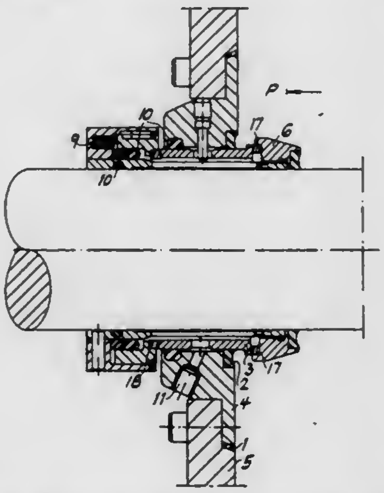
5,462,289

SEALING ARRANGEMENT AT LEAD-THROUGH SHAFTS

Göran Anderberg, 261 61 Landskrona, Strandvägen 303, Sweden

Filed Apr. 14, 1993, Ser. No. 47,230
Int. Cl.^{6} F16J *15/10*

U.S. Cl. 277—65 **11 Claims**



1. A sealing arrangement for a shaft extending from a product space under pressure, comprising a cover exposed to the pressure in the product space, radially outer and inner seal rings on said cover facing the product space, said outer seal ring being of uniform thickness in a non-pressurized state, said outer seal ring having a region adjacent to said space which is radially compressed upon assembly in the sealing arrangement, said cover having a surface to which the outer seal ring is bonded by vulcanization, said surface forming an angle of about 15° relative to a horizontal plane, and a wall having a surface abutting against an opposite surface of the outer seal ring, said surface of the wall forming an angle of about 20° relative to a horizontal plane so that radial compression is applied to said region of the outer seal ring when said wall and said cover are assembled with the outer seal ring therebetween.

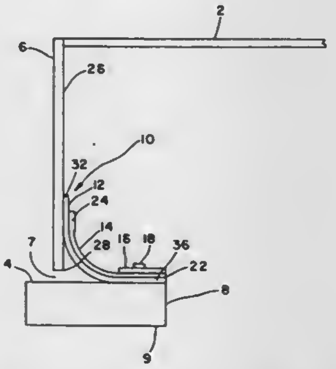
5,462,290

SEAL MEANS BETWEEN A ROTATING CYLINDER AND STATIONARY CHUTE

Royce L. Alday, Macon, Ga., assignor to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Filed Feb. 14, 1994, Ser. No. 195,124
Int. Cl.^{6} F16J *15/32*

U.S. Cl. 277—95 **8 Claims**



1. A flexible seal device between a rotating cylinder and a stationary chute wherein said rotating cylinder has an infeed end with a first opening therein and said stationary chute has a discharge end with a second opening therein, said first opening having a diameter greater than an outer diameter of said discharge end and receiving said discharge end therein, said flexible seal device comprising:

a ring shaped flexible material circumscribing said discharge end and extending upwardly and rearwardly from said discharge end of said stationary chute; and

a plurality of steel spring clips spaced around a preselected portion of the outer periphery of said discharge end forcing an outer periphery of said flexible material against an inner wall of said infeed end of said rotating cylinder thereby forming a seal between said discharge end and said infeed end.

5,462,291

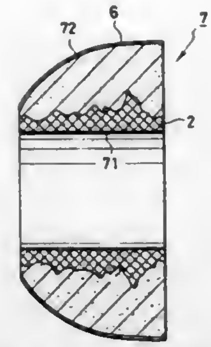
SPHERICAL ANNULAR SEAL WITH OUTER SLIDING LAYER

Takashi Maeda, Fujisawa; Takeshi Furukido, Yamato; Kousaku Hoshino, Fujisawa; Satoru Udo, Nakatsu, and Masayoshi Izumi, Chikujo, all of, Japan, assignors to Oiles Corporation, Tokyo, Japan

Filed Oct. 4, 1993, Ser. No. 130,898
Claims priority, application Japan, Jan. 12, 1992, 4-300550
Int. Cl.^{6} F16J *15/12*

U.S. Cl. 277—100 **8 Claims**

1. A spherical annular seal particularly used for an exhaust pipe joint, said spherical annular seal being formed by compression forming a mixture of a solid lubricant, metal short fibers, and a synthetic resin binder, said spherical annular seal having a through hole in a center thereof and a partially convex spherical surface portion on an outer surface thereof, wherein an inner peripheral surface of said spherical annular seal defining the through hole is reinforced by a reinforcing member formed of a metal mesh, and a uniform lubricating sliding layer of a lubricating composition



containing 70 to 90 wt. % of boron nitride and 10 to 30 wt. % of a refractory substance chosen from the group consisting of alumina, silica, and an alumina/silica mixture is formed on a surface of said partially convex spherical surface portion.

5,462,292
DOOR SEAL DEVICE

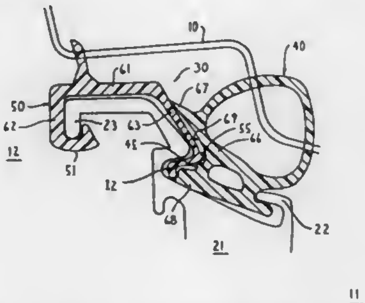
Tadanao Yamane, Hiroshima, Japan, assignor to Nishikawa Rubber Co., Ltd., Hiroshima, Japan

Filed Nov. 30, 1993, Ser. No. 160,069

Claims priority, application Japan, Nov. 30, 1992, 4-345267; Nov. 30, 1992, 4-345268

Int. Cl.⁶ G06B *7/16*

U.S. Cl. 277—181 **7 Claims**



1. In a door seal device for sealing a space between a vehicle body and a door which is moveable relative to the vehicle body, said seal device comprising a hollow main seal and a sub-seal which elastically contact an opening end edge wall of the body for sealing the space between the body and the door:

- the door including a sash composed of a body have a channel-like retainer formed on an upper side thereof adjacent an interior side of the door, and a hook part formed thereon adjacent an exterior side of the door;
- the sub-seal being mounted on the sash adjacent the exterior side thereof and including a body which covers an upper surface of the sash adjacent the exterior side thereof, the sub-seal including a first hook portion associated with one side of the body and positioned more closely adjacent the exterior side of the door and engaged with the hook part of the sash, the sub-seal including a second hook portion positioned inwardly relative to the first hook portion and engaged in the channel-like retainer;
- said main seal being disposed adjacent the interior side of the door and positioned sidewardly adjacent and arranged along the sub-seal, the main seal having a sidewall part which is positioned in adjacent and opposed relationship to and substantially overlaps a side of said body as well as said second hook portion;
- the improvement wherein slip-preventing ribs project outwardly from the main seal and the sub-seal and respectively firmly contact the sub-seal and the main seal at a position where the sidewall part of the main seal overlaps the sub-seal, said position being in the vicinity of said second hook portion.

5,462,293
CHUCK HAVING AN INTEGRATED CONE OR MACHINE SPINDLE

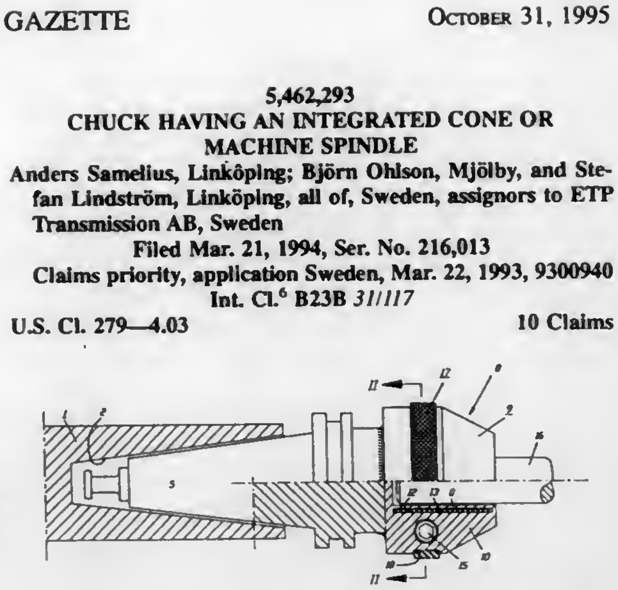
Anders Samelius, Linköping; Björn Ohlson, Mjölby, and Stefan Lindström, Linköping, all of, Sweden, assignors to ETP Transmission AB, Sweden

Filed Mar. 21, 1994, Ser. No. 216,013

Claims priority, application Sweden, Mar. 22, 1993, 9300940

Int. Cl.⁶ B23B *31/117*

U.S. Cl. 279—4.03 **10 Claims**



1. Apparatus for clamping tools or work pieces in rotating machine tools comprising a clamp bushing connected to a mounting cone or a machine spindle to provide an integral unit, said clamp bushing comprising:

- a housing comprising a thin inner sleeve and a solid outer sleeve surrounding said inner sleeve;
- a chamber between said inner and outer sleeves for receiving a hydraulic pressure medium, said inner sleeve being arranged to center and clamp a rotating tool or work piece during pressurization of the hydraulic pressure medium;
- a bore extending from a periphery of said housing into said chamber for providing an entrance for means for pressurizing the hydraulic pressure medium;
- a protection ring about a periphery of said outer sleeve, said protection ring being rotatable relative to said bushing, said protection ring covering said bore in at least a first rotated position and exposing said bore in at least a second rotated position.

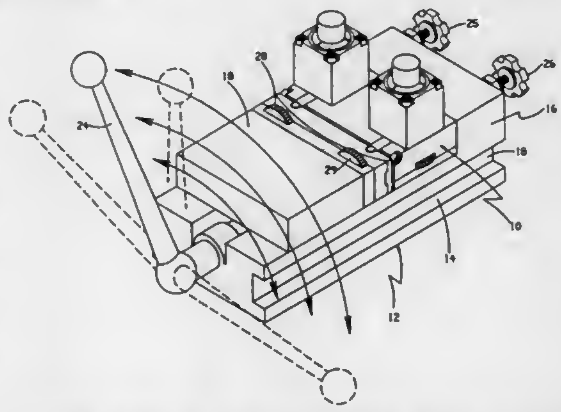
5,462,294
COLLET ADAPTER FOR CONVERTING MACHINE VISE TO AN ORTHOGONAL COLLET FIXTURE

Kurt F. Wendhack, 700 Perrie Dr. Unit 308, Elk Grove Village, Ill. 60007

Continuation-in-part of Ser. No. 265,270, Jul. 1, 1994. This application Sep. 26, 1994, Ser. No. 312,272

Int. Cl.⁶ B23B *31/20;* **B23Q** *3/06;* **B25B** *1/02*

U.S. Cl. 279—51 **17 Claims**



1. A collet adapter for converting a standard machine vise into a collet fixture wherein the vise includes relatively removable elements, vise jaws and an actuator, comprising: a first member and a second member, means on the first and second members for fixedly attaching them to the vise elements, a sleeve carried by one of the first and second members having an axially tapered internal por-

tion, a workpiece receiving collet in the sleeve having an axially tapered outer portion engaging the tapered internal portion on the sleeve, and means for moving the collet axially relative to the sleeve as the first member moves relative to the second member so a workpiece in the collet is radially clamped thereby, said means for moving the collet axially relative to the sleeve including a cam pivotal on an axis perpendicular to the axis of the collet in at least one plane, said cam being responsive to movement of the vise elements which in turn causes movement of the first and second members effecting workpiece clamping and unclamping without requiring the set-up of a conventional collet fixture.

5,462,295

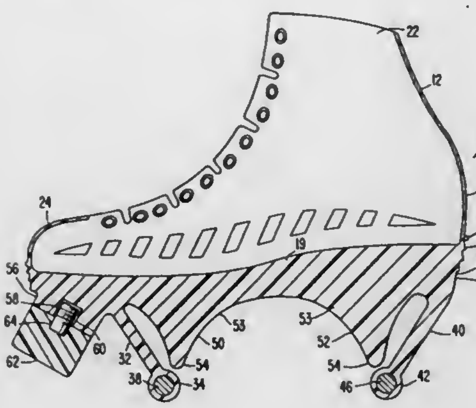
HOMOGENEOUS INTEGRALLY MOLDED SKATE AND METHOD FOR MOLDING

Edwin Seltzer, West Chester, Pa., assignor to Roller Derby Skate Corporation, Litchfield, Ill.

Continuation-in-part of Ser. No. 998,929, Dec. 30, 1992, Pat. No. 5,326,115. This application Feb. 4, 1994, Ser. No. 191,509

Int. Cl.^{6} A63C *17/02*

U.S. Cl. 280—11.19 27 Claims



1. A plastic skate molded as a single, homogenous, integrally molded piece from compatible plastics having different flexibility characteristics comprising:

a boot portion for receiving a skater's foot having a molded plastic outer shell including a toe portion, a heel portion spaced from said toe portion, first and second opposed sidewall portions extending longitudinally from said toe to said heel portion, and a base portion extending between said sidewall portions and said heel and toe portions, said base portion including a bottom side and a top side surface which forms the bottom foot support for said skater's foot and which with said heel, toe and sidewall portions defines a cavity within said molded outer shell for receiving a skater's foot which is supported and enclosed thereby, said outer shell being formed of a first thermoplastic elastomer and

a support structure molded integrally with said base portion and extending from the bottom side of said base portion, said support structure being formed of a second thermoplastic elastomer which is different from said first elastomer, said second elastomer, when cooled, being more rigid and less flexible than said first elastomer when cooled, said boot portion and support structure being formed as a single unitary piece with no junctures therebetween and no separable moving parts.

5,462,296

BRAKING DEVICE PARTICULARLY FOR SKATES

Alessandro Pozzobon, Paderno Di Ponzano Veneto, Italy, assignor to Nordica S.p.A., Montebelluna, Italy

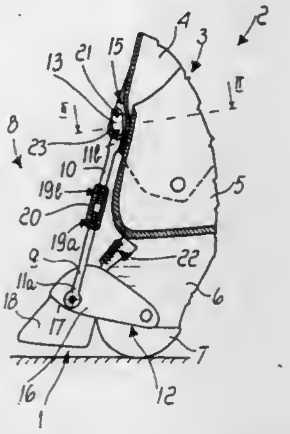
Filed Jan. 21, 1994, Ser. No. 184,705

Claims priority, application Italy, Jan. 29, 1993, TV93A0009

Int. Cl.^{6} A63C *17/14;17/06*

U.S. Cl. 280—11.2 24 Claims

1. Braking device in a skate, the skate comprising a shoe composed of at least one quarter articulated to a shell associated with a supporting frame for a plurality of wheels, the braking device comprising at least one rod member connected to a braking element, said rod member being operatively connected between said braking element and said quarter through a kinematic means, said kinematic means being adapted to assume a locked position and an unlocked position, said braking element being adapted to interact with a braking surface upon a degree of backward rotation of said quarter when said kinematic means are in said locked position, said kinematic means being suitable to allow said degree of backward rotation of said at least one quarter without activating said braking element against said braking surface when said kinematic means are in said unlocked position, the braking device further comprising releasable locking means for releasably locking said kinematic means in said locked position thereof.



5,462,297

ROLLER-SKATE WITH IMPROVED BRAKE DEVICE

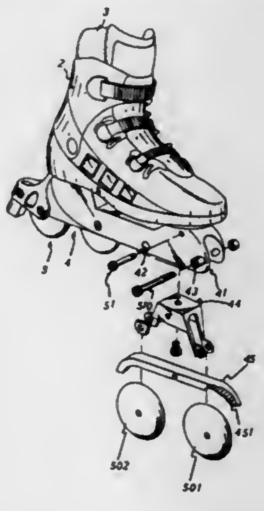
Min-Kuo Lee, Chia Yi Hsien, Taiwan, Prov. of China, assignor to HI-Star Co., Ltd., Chia Yi Hsien, Taiwan, Prov. of China

Filed Oct. 20, 1994, Ser. No. 326,234

Int. Cl.^{6} A63C *17/14*

U.S. Cl. 280—11.2 1 Claim

1. A roller-skate with improved brake device, comprising a skate



body, a skate sleeve, a wheel support, and wheel members;

said skate sleeve made of sponge and fitted in the skate body to separate a user's foot from the skate body for protection of a user's foot;

said skate body molded in the shape of a man's foot and provided with lace holes for passage of a shoelace therethrough and ventilating through holes of various shapes to keep the interior of the shoe body ventilated;

said wheel support mounted under said skate body, forming a longitudinal groove at a center of wheel support, both sides of wheel support having several through holes at equal intervals for the mounting of rolling axles, and by way of spindle bearings, fixing the wheel members inside of the longitudinal groove in a row at equal intervals;

a spring mount engaged to said wheel support,

a guidance slot slanting upwards on said wheel support to allow the upward movement of a first rolling axle within the guidance slot; and

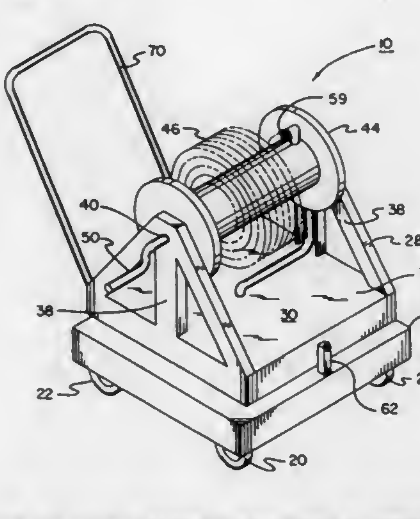
a brake plate engaged within the spring mount, the brake plate having a brake lining fixed in place between a first wheel member and a second wheel member;

wherein when a skater lurches forward, the first rolling axle moves upwards through the guidance slot against a first end of the brake plate and the brake lining and through leverage, bends the brake plate downward so that a second end of the brake plate and brake lining engages against the second wheel member to further limit motion of the second wheel member, thereby effecting braking of both the first wheel and the second wheel member.

5,462,298
WATER HOSE CART

Daryl L. Bodine, 1538 Rte. 54, Penn Yan, N.Y. 14527
Filed Dec. 7, 1994, Ser. No. 350,454
Int. Cl.^{6} B62B *3/10*

U.S. Cl. 280—47.34 **5 Claims**



1. A water hose cart assembly comprising, in combination:

a base in a rectangular configuration having an upper surface and a lower surface, the base having a plurality of axles parallel with each other extending across the width of the base and rotatable wheels secured to the axle exterior of the base, the wheels including a pair of front wheels and a pair of rear wheels, the front wheels being located on castors to effect the movement thereof in one direction or another;

a deck having a rectangular base with an upper surface and a lower surface, the lower surface being positioned adjacent to the upper surface of the base with a circular bearing assembly between the deck and the base for rotation of the deck with respect to the base, the deck having upstanding side brackets on opposite sides thereof with aligned apertures at their upper extents;

a spool positioned on the deck between the side brackets for supporting a reeled hose thereon, the spool having an aperture therethrough aligned with the apertures of the side brackets with a shaft positioned between the apertures of the side brackets and wheel for the rotation thereof and a hose crank for rotation by an operator located exterior of one of the side brackets;

a tube coupling extending from the rear end of the base in a horizontal direction and then vertically between the base and the deck with a rotatable coupling therebetween, the tubing then extending to and through one of the side brackets terminating in an inboard fitting and to adjacent the spool for coupling with the hose wound about the spool;

a locking component secured to the deck and adapted to be selectively coupled to an aperture in the base for effecting a locking therebetween, the pin being removable from the aperture for allowing the rotation of the deck;

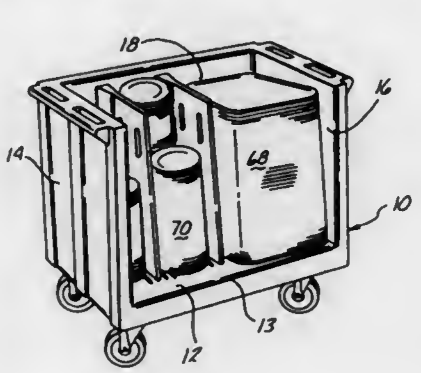
a handle pivotally secured to the front edge of the bases in an inverted U-shaped configuration with pivot pins at the lower free ends secured to the base for pulling the base and deck to an appropriate location; and

a lock secured to at least one of the front wheels for securing the wheel in a preset orientation to effect the locking of the base with respect to the ground, the brake being disengagable to allow for the free rotation of its associated wheel for movement of the base to an appropriate location for operation and use.

5,462,299
TRAY AND DISH CART

Larry D. Maddux, Westminster, Calif., assignor to Cambro Manufacturing Company, Huntington Beach, Calif.
Filed Sep. 2, 1993, Ser. No. 116,006
Int. Cl.^{6} B62B *3/02*

U.S. Cl. 280—47.35 **14 Claims**



1. A movable cart comprising:

a base member having a major surface with a plurality of sides;

casters attached to said base member;

one or more walls including one rear wall attached to one of the side of said base member leaving one side open;

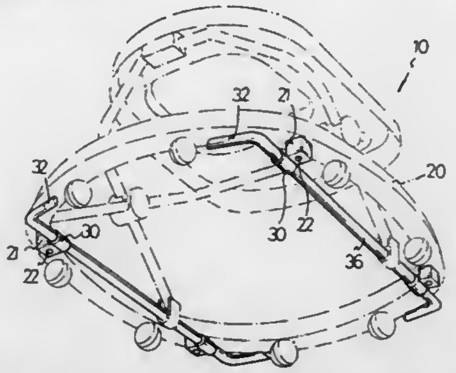
a plurality of channels separated by lands disposed within said base member and said rear wall;

at least one upright panel removably placed within said cart to divide said cart into compartments, each said panel having one or more edges including at least a bottom edge, and a rearward edge, said bottom edge being sized to fit within said channels of said base member, said rearward edge being formed by an enlarged portion having a plurality of rearwardly extending flanges, each flange being separated from an adjacent flange by a land and each flange being sized to fit within said channels of said rear wall; and,

means attached to said at least one panel and said rear wall for removably securing said panel to said rear wall.

5,462,300
GO-CART RESTRAINER

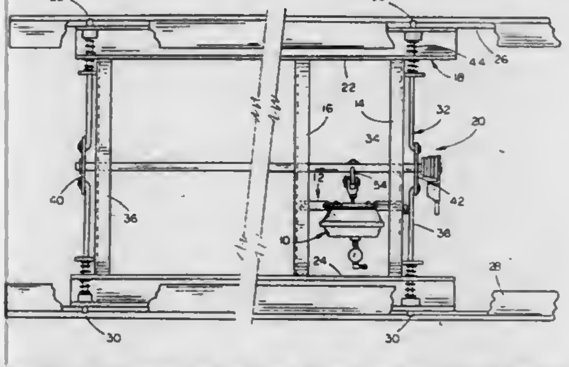
Jui-Lung Chien, Taichung, Taiwan, Prov. of China, assignor to Jina Manufacturer Thai Co., Ltd., Bangkok THX
Filed Sep. 13, 1994, Ser. No. 304,862
Int. Cl.^{6} B62B *9/08*
U.S. Cl. 280—87.051 **8 Claims**



1. A go-cart including a base, a plurality of wheels attached to the base and a restrainer operatively linked to the base for restraining the go-cart, wherein the restrainer comprises two stands each including a shaft pivotably linked to the base of the go cart, two feet projecting from the shaft so that the feet are pivotable between a horizontal position for engaging the wheels with the ground and a vertical position for disengaging the wheels from the ground and a device for retaining the feet in one of the vertical and horizontal positions, the retaining device comprising two pairs of collars each defining an aperture, two apertures defined in each of the shafts, two retainers slidably attached to the base of the go-cart, wherein the collars are secured to the base of the go-cart, wherein each of the shafts is pivotably insertable in one of the pairs of the collars, wherein each of the retainers is insertable through the aperture defined in one of the collars into one of the apertures defined in one of the shafts for retaining each of the feet in one of the horizontal and vertical positions.

5,462,301
MEANS FOR MOUNTING AN AIR POWERED ACTUATOR FOR RETRACTING THE LOCKING PINS OF A SLIDER

Gerald L. Schueman, Oakland, Iowa, assignor to Schueman Enterprises, Inc., Oakland, Iowa
Continuation-in-part of Ser. No. 195,852, Feb. 10, 1994, Pat. No. 5,449,187. This application Apr. 14, 1995, Ser. No. 422,213
Int. Cl.^{6} B60P *1/00*
U.S. Cl. 280—149.2 **1 Claim**



1. A slider for adjustment of the suspension of a vehicle longitudinally with respect to the body of the vehicle, the slider comprising a pair of side rails adapted to be secured at the left and right sides of the body in a fixed position extending longitudinally of the body, and a frame adapted to carry the suspension comprising left and right slide members slidable longitudinally of the body on the side rails, said frame including at least first and second horizontally-spaced apart frame members which extend between said left and right slide members, each of said frame members having upper and lower ends, first and second locking pins for locking the frame in various positions of adjustment relative to the side rails, said first and second locking pins being retractable for permitting adjustment of the frame to a selected position of adjustment and extensible for locking the frame in a selected position of adjustment, means for retracting said first and second locking pins including linkage interconnecting said first and second locking pins for conjoint movement of the locking pins between extended and retracted positions, spring means associated with said locking pins for yieldably urging said locking pins to their extended positions wherein the improvement comprises:

an air powered actuator means mounted on said slider including a movable actuator extending therefrom which is operatively secured to said linkage to effect retraction of said first and second locking pins;

said air powered actuator means including a mounting bracket having a substantially vertically disposed central portion including an upper end, a lower end, a rearward end, and a forward end, a first support arm extending forwardly from the forward end of said central portion at the lower end thereof, said first support arm being secured to said first frame member at the lower end thereof, a second support arm extending rearwardly from the rearward end of said central portion at the lower end thereof, said second support arm being secured to said second frame member at the lower end thereof, a horizontally disposed tube secured to the upper end of said central portion, an elongated rod removably received by said tube, one end of said elongated rod extending through said first frame member at the upper end thereof, the other end of said elongated rod extending through said second frame member at the upper end thereof, said elongated rod including means for maintaining said rod in said first and second frame members.

5,462,302
DOUBLE SWINGARM FRONT SUSPENSION FOR BICYCLES AND MOTORCYCLES

Horst Leitner, 429 Aster St., Laguna Beach, Calif. 92651
Continuation of Ser. No. 782,614, Oct. 25, 1991, abandoned. This application Oct. 25, 1993, Ser. No. 142,837
Int. Cl.^{6} B62K *21/02*
U.S. Cl. 280—277 **12 Claims**

1. A suspension system for a bicycle having a frame, a steering shaft defining a steering axis secured to and pivotable relative to said frame, and a front wheel defining an axle, comprising:

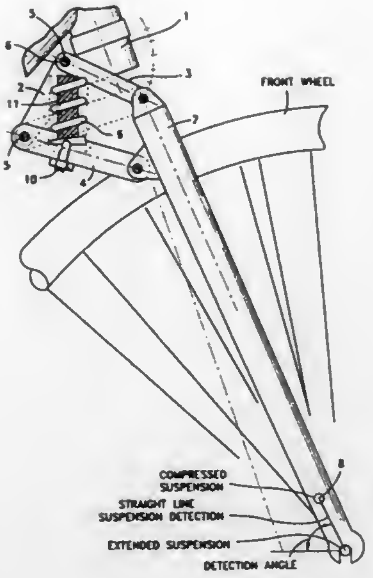
a support member secured to said steering shaft;

a fork defining a pair of generally straight parallel fork arms having an upper end and a bottom end, each of said pair of fork arms defining an axis, said bottom end of said fork retaining said axle of said front wheel;

a top arm pivotably secured to said support member proximate said steering shaft and pivotably secured to said upper end of said fork;

a lower arm comprising a single piece straddling said front wheel, said lower arm pivotably secured to and straddling said support member distal said top arm from said steering shaft, and pivotally secured to said upper end of said fork at a position spaced toward said bottom end of said fork from said top arm;

means for resisting movement of said lower arm toward said steering shaft, wherein said top arm and said lower arm have different lengths and are nonparallel with respect to one another such that said bottom end of said fork arms moves linearly in response to impact transmitted through said front wheel.



5,462,303
SIDE STRUT FOR A LOWER STEERING ARM OF A TRACTOR

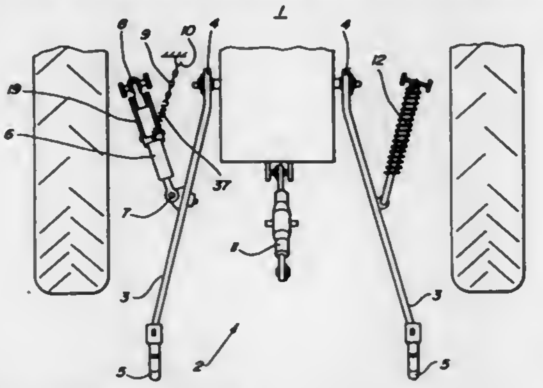
Hans-Jürgen Langen, Frechen; Jürgen Vollmer, Lohmar, and Andreas Sarfert, Bonn, all of, Germany, assignors to GKN Walterscheid GmbH, Lohmar, Germany

Filed Mar. 25, 1994, Ser. No. 218,113

Claims priority, application Germany, Mar. 27, 1993, 43 10 027.9

Int. Cl.^{6} A01B *59/041*

U.S. Cl. 280—455.1 **4 Claims**



1. A side strut for a lower steering arm of a three-point attaching device of a tractor, comprising:

a first articulating telescopic member secured to the tractor;

a second articulating telescopic member secured to the lower steering arm, said two telescopic members being adjustable relative to one another along an adjustment axis between an inserted position and a maximum extracted position;

a locking pawl pivotally attached to one of the two telescopic members around an axis transverse to the adjustment axis, said locking pawl pivoting between a locking and unlocking position, said pawl including two cheeks, said cheeks positioned parallel to one another and arranged at sides of the two telescopic members and connected to one another by a bridge;

two locking stops extending transversely relative to the adjustment axis, projecting from the other of the two telescopic members and form-fittingly embraced by locking recesses in the cheeks when the locking pawl is in the locking position;

the cheeks of the locking pawl further include one or several extending steps; and

a fixing device connected to one of said two telescopic members and extending between said two cheeks and projecting through an aperture in said bridge and the fixing device limits the maximum pivot path of the locking pawl relative to the locking stops.

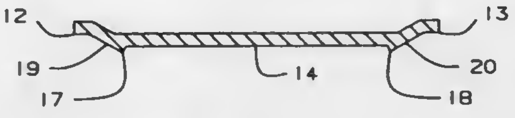
5,462,304
SNOWBOARD WITH DUAL-ACTING, INTERCHANGEABLE EDGES

Bengt E. Nyman, 4025 Carmel View Rd. #132, San Diego, Calif. 92130

Filed Oct. 25, 1993, Ser. No. 142,824

Int. Cl.^{6} A63C *5/04*

U.S. Cl. 280—609 **6 Claims**



1. A snowboard comprising:

a curved up nose, a top, a flat bottom, a tail, and two curved up, sawtooth shaped side surfaces, each said side surface cross-section perpendicular to the length axis of said bottom forming a curved up, sawtooth shape extending essentially the full length of the snowboard, the first of said sawtooth surfaces extending from the edge of said bottom and pointing out and up at a shallow angle from the plane of said bottom, a second sawtooth surface extending from the outside edge of said first sawtooth surface and pointing out and down at a shallow angle toward the plane of said bottom surface, said second sawtooth surface terminating at an elevation slightly above that of said bottom surface, a third sawtooth surface extending from the outside edge of said second sawtooth surface and pointing out and up at an angle to said bottom surface which is larger than that formed by said first sawtooth surface to said bottom surface, said third sawtooth surface terminating at an elevation well above that of said bottom surface, a fourth sawtooth surface extending from the outside edge of said third sawtooth surface and pointing essentially straight out and parallel to said bottom surface, said fourth sawtooth surface being elevated well above said bottom surface, a fifth and final surface pointing essentially straight up and connecting said curved up, sawtooth shaped side construction to said top of said snowboard.

5,462,305
AIRBAG RESTRAINT UNIT

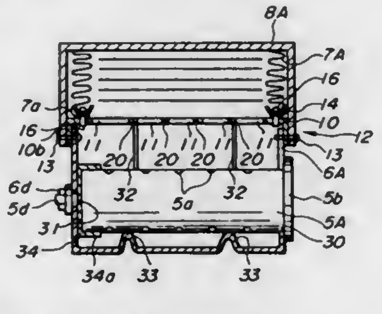
Shinji Hamada, Ayase, Japan, assignor to Ikeda Bussan Co., Ltd., Ayase, Japan

Filed Jun. 8, 1993, Ser. No. 73,074

Claims priority, application Japan, Jun. 11, 1992, 4-177528

Int. Cl.^{6} B60R *21/20*

U.S. Cl. 280—728.2 **9 Claims**



1. An airbag restraint unit comprising:

a gas generator storage container including an upper base section having a first mounting portion and a different and separate second mounting portion, and a lower base section fixedly secured to said upper base section at said first mounting portion by first fastening means and located below said upper base section, said upper base section being formed with a gas ejection opening, said lower base section having first and second end walls which are separate from each other and located opposite to each other, said first end wall being formed with a gas generator insertion hole, said second end wall being formed with a bolt section insertion hole;

a gas generator for generating gas and ejecting gas through gas ejection holes thereof, said gas generator being disposed in said storage container and including an elongate body section, said gas generator having a bolt section located at one end portion of said gas generator, said gas generator being inserted into said storage container through said lower base section gas generator insertion hole to be located at a predetermined position at which said bolt section is inserted in said bolt section insertion hole of said lower base section second end wall to be fastened in position with a nut;

an airbag fixedly secured to said storage container upper base section at said second mounting portion by second fastening means in a manner that gas from said gas generator is introduced into said airbag through said upper base section gas ejection opening, said second fastening means being different from said first fastening means, wherein said gas generator and said airbag are located, respectively, on opposite sides of said second mounting portion of said upper base section of said gas generator storage container;

an airbag cover for covering said airbag in a folded state; and

at least one support section for supporting said body section of said gas generator, said support section being formed on an inner surface of at least one of said upper and lower base sections, said support section extending generally in a direction traversing the axis of said gas generator body in plan, said support section guiding said gas generator to said predetermined position when said gas generator is inserted into said storage container.

5,462,306

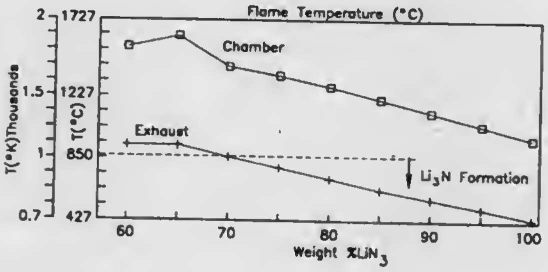
GAS GENERATOR FOR VEHICLE OCCUPANT RESTRAINT

Eric S. Barcaskey, Phoenix, Ariz., assignor to TRW Inc., Lyndhurst, Ohio

Continuation-in-part of Ser. No. 6,817, Jan. 21, 1993, abandoned. This application Feb. 22, 1995, Ser. No. 392,605

Int. Cl.⁶ B60R *21/26;* **C06B** *31/00*

U.S. Cl. 280—736 **20 Claims**



1. A vehicle occupant restraint assembly comprising:

a vehicle occupant restraint;

a housing;

a gas generating composition within the housing;

an igniter for igniting the gas generating composition; and

gas flow means for directing gas from said housing to said vehicle occupant restraint;

said gas generating composition comprising lithium azide and a metal oxidant (MeO) wherein the metal oxidant is present in a sub-stoichiometric amount with respect to the lithium azide, the ratio of lithium azide to metal oxidant being a ratio effective to produce lithium nitride (Li_3N).

12. A gas generating composition for inflating a vehicle occupant restraint comprising active ingredients consisting essentially of lithium azide and a metal oxidant wherein the lithium azide is present in an effective amount to, in reaction with the metal oxidant, produce an amount of lithium nitride (Li_3N).

5,462,307

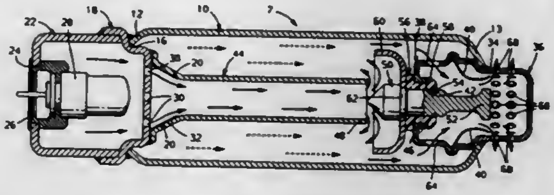
SUPPLEMENTAL INFLATION RESTRAINT INFLATOR

James L. Webber, Centerville, and Francis J. Holmes, Beavercreek, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 27, 1994, Ser. No. 363,790

Int. Cl.⁶ B60R *21/26*

U.S. Cl. 280—737 **7 Claims**



1. A hybrid air bag inflator for filling an air bag with compressible gas comprising:

an elongated pressure chamber having stored therein a compressed gas having a first end and a second end with first and second apertures, respectively, at the first and second ends;

a first membrane sealing the first aperture;

a second membrane sealing the second end;

a tube connected with the first end of the first pressure chamber having a base fluidly connecting with the first aperture, the tube extending a substantial portion of the length of the first pressure chamber in a direction toward the first pressure chamber second end;

a second pressure chamber mounted adjacent the first pressure chamber first end and exposed to the first membrane;

an igniter responsive to a signal positioned within the second chamber;

a pyrotechnic material packaged within the second chamber;

a piston with a first end mounted in the tube and a second end for puncturing the second membrane when the igniter has lit the pyrotechnic material in the second pressure chamber, causing generation of heated gases and rupture of the first membrane, and for hot gases to move through the tube toward the first pressure chamber first end, causing a pressure force to be exerted on the piston, thereby causing the piston to move toward the first pressure chamber second end and puncture the second membrane; and

a deflector ring mounted within the first pressure chamber between the first pressure chamber second end and an end of the tube most adjacent the first pressure chamber second end, the deflector ring encircling the piston and directing the heated gas flowing in the tube toward the first pressure chamber second end to reverse and flow toward the first end of the first pressure chamber.

5,462,308

OCCUPANT PROTECTING SYSTEM FOR VEHICLE

Kazuhiro Seki; Takashi Aoki; Shinichi Hirahara, and Yasuki Motozawa, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 9, 1994, Ser. No. 257,780

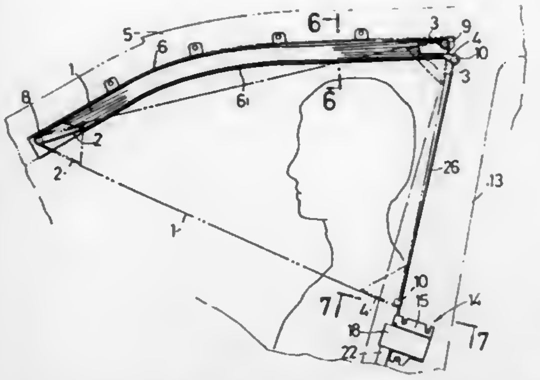
Claims priority, application Japan, Jun. 11, 1993, 5-140914

Int. Cl.⁶ B60R *21/08*

U.S. Cl. 280—749 **7 Claims**

1. An occupant protecting system for a vehicle, comprising:

a shock absorbing membrane member of a substantially triangular configuration which is folded in an inoperative state of the



system and is unfoldable and developed between a vehicle body and an occupant upon collision of the vehicle,

said membrane member having fixed points at two corner portions which are fixed to a vehicle body and having one movable point which is located near one of said fixed points when said membrane member is folded, said movable point being movable substantially straightforwardly along the vehicle body away from said one fixed point when said membrane member is unfolded; and

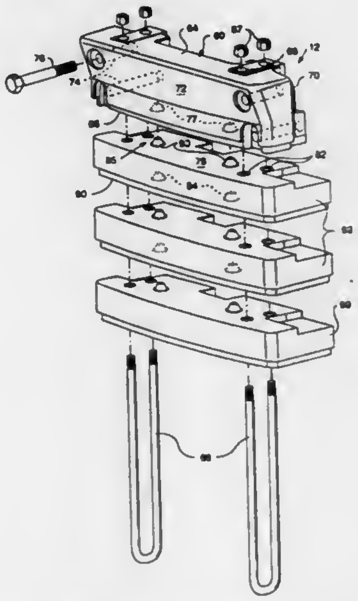
developing means for developing said shock absorbing membrane member by moving said movable point upon collision of said vehicle.

5,462,309

STACKABLE COUNTERWEIGHT ARRANGEMENT

Scott E. Jeffers, Clayton, and David B. Frankel, Cary, both of N.C., assignors to Caterpillar Inc., Peoria, Ill.
Filed May 20, 1994, Ser. No. 247,186
Int. Cl.⁶ E02F *9/18*

U.S. Cl. 280—759 **2 Claims**



1. A counterweight arrangement adapted to be mounted on a frame of a machine, comprising:

a first weight having first and second side surfaces and upper and lower surfaces with a plurality of first mounting holes extending vertically therebetween, and a plurality of second mounting holes extending horizontally between the first and second side surfaces;

a plurality of first attaching means adapted to extend through said plurality of second mounting holes and releasably connect said first weight to the frame of the machine;

a second weight having upper and lower surfaces with a plurality of mounting holes extending vertically between said upper and lower surfaces; and

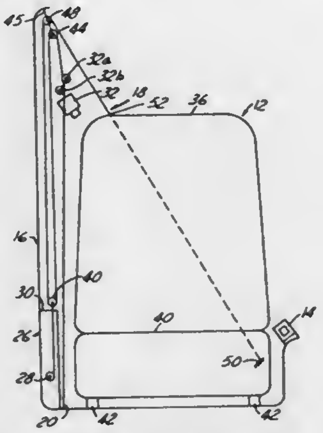
a plurality of second attaching means adapted to extend through said mounting holes in said second weight and through said first mounting holes in said first weight and connect said second weight subjacent and to said first weight.

5,462,310

SEAT BELT CONSTRUCTION

Miroslav Jaksic, 4935 Fairways Dr., Brighton, Mich. 48116
Filed Jul. 11, 1994, Ser. No. 273,198
Int. Cl.⁶ B60R *22/00*

U.S. Cl. 280—808 **20 Claims**



1. A restraint for an occupant of a vehicle comprising:

a seat having a first side, a second side, a front surface, a back surface, and a back rest with a front surface and a back surface, said seat being mounted on a vehicle frame,

a seat belt having opposed ends, a first end being secured to the vehicle adjacent the first side of said seat and a second end being secured to the back surface of said seat adjacent the second side thereof so that said seat belt forms a back restraint extending from the first side to the second side of said seat across the back surface of the back rest of said seat and supporting the back rest of said seat to constrain an occupant of said seat in the rearward direction in the event that the back rest of said seat fails,

a latch connected to said seat belt at an intermediate portion thereof,

a buckle mounted to releasably hold the latch adjacent the second side of said seat, and

a seat belt retractor mounted on the vehicle and operably connected to said seat belt to retract said seat belt during non-use.

5,462,311

TELESCOPING WAND FOR VACUUM CLEANERS

Mark E. Cipolla, Chardon, Ohio, assignor to Royal Appliance Mfg. Co., Cleveland, Ohio
Filed Nov. 13, 1992, Ser. No. 976,439
Int. Cl.⁶ A47L *9/24*

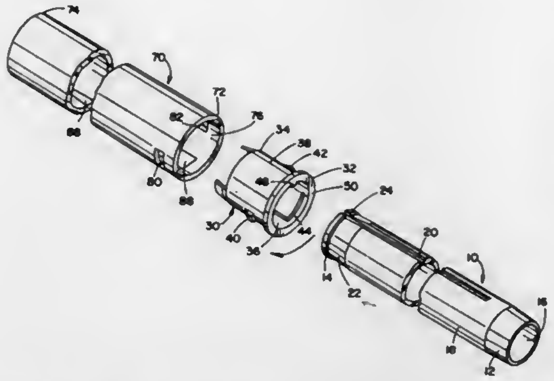
U.S. Cl. 285—7 **21 Claims**

11. A telescoping assembly comprising:

a first tube having an outer diameter;

a second tube having an inner diameter which is larger than said outer diameter of said first tube so that said first tube fits within said second tube in a sliding manner;

a collet positioned within said second tube and encircling said first tube, said collet comprising a locking means for selectively securing said first tube in relation to said second tube in a plurality of longitudinal positions, said locking means cooperating with a portion of said second tube upon an associated



rotation of said collet and said first tube to prevent a telescoping movement of said first tube in relation to said second tube;
- a means for securing said collet to said second tube; and,
- a means for allowing said first tube to slide axially in relation to said collet when said first tube telescopes into and out of said second tube.

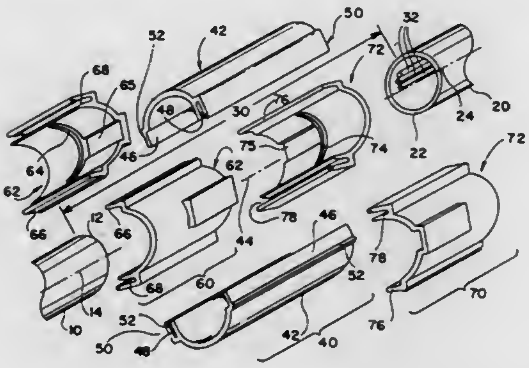
5,462,312
TUBING COUPLING ENCLOSURE

Val Carpenter, and Steve W. Webb, St. George, both of Utah, assignors to Conducit Repair Systems, Inc., St. George, Utah

Filed Jun. 23, 1994, Ser. No. 264,576

Int. Cl.⁶ F16L *21/06*

U.S. Cl. 285—15 **19 Claims**



1. An enclosure for a splice connection between a first and a second length of tubing, the first length of tubing has a first longitudinal axis and a first terminus, the second length of tubing has a second longitudinal axis and a second terminus, a gap exists between the first terminus and the second terminus, said enclosure comprising:
- an intermediate section extending between the first terminus and the second terminus so as to substantially fill the gap, said intermediate section includes a plurality of first identical interlocking elements;
- a first end section overlying and circumscribing portions of both the first terminus and said intermediate section, said first end section includes a plurality of second identical interlocking elements; and,
- a second end section overlying and circumscribing portions of both the second terminus and said intermediate section, said second end section includes a plurality of third identical interlocking elements.

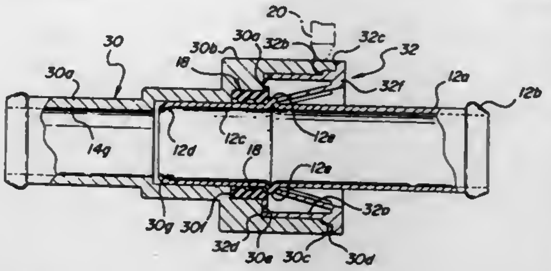
5,462,313
QUICK CONNECT COUPLING

Perry J. Rea, Bloomfield Hills; Michael R. Miller, Rochester Hills; Gary T. Ber, Rochester, and William E. Stevens, Ypsilanti, all of Mich., assignors to Form Rite Corporation, Auburn Hills, Mich.

Continuation-in-part of Ser. No. 142,764, Oct. 26, 1993. This application Jan. 3, 1994, Ser. No. 176,243

Int. Cl.⁶ F16L *21/08*

U.S. Cl. 285—21 **25 Claims**



1. A quick connector coupling comprising:
- a tubular male connector member including a front end portion and an external annular bead defined at the rear end of the front end portion;
- a tubular female connector member having a front end adapted to receive the front end portion of the tubular male connector member and defining a capture bore sized to receive the front end portion of the tubular male connector member, a seal counterbore positioned forwardly of the capture bore, and circumferentially spaced resilient prong means for latching coaction with the rear annular face of the annular bead of the tubular male connector member in response to insertion of the front end portion of the male connector member into the front end of the female member and into the capture bore;
- an annular seal positioned in the seal counterbore and including a plurality of successive axially spaced annular internal seal ribs sealingly and slidably engaging the front end portion of the male connector member;
- the tubular female connector member including a first tubular piece defining the capture bore and the seal counterbore and a second tubular piece connected to the first tubular piece and defining the resilient prong means;
- the first and second pieces being formed of a plastic material and being connected by fusion bonding.

5,462,314
ELECTRO-FUSION FITTING HAVING A SOLID EMBEDDED HEATER WITH PERPENDICULAR PROJECTIONS

Yuichiro Goto; Hideki Kasa, and Takatomo Harada, all of Osaka, Japan, assignors to Gas Research Institute, Chicago, Ill.

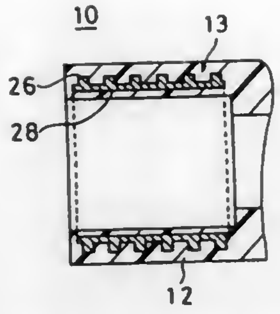
Continuation of Ser. No. 776,378, Jan. 24, 1992, abandoned. This application Mar. 15, 1994, Ser. No. 213,238

Claims priority, application Japan, Mar. 30, 1990, 2-86847

Int. Cl.⁶ F16L *47/02*

U.S. Cl. 285—21 **5 Claims**

1. An electro-fusion fitting for coupling a member to be coupled, said member to be coupled made of a first synthetic resin material and having a curved first joint surface, said fitting comprising:
- a body made of a second synthetic resin material and having a second joint surface forming a curved surface which substantially conforms to said first joint surface of said member to be coupled, said first and second synthetic resin material having first and second fusion temperatures, respectively; and
- a solid heater element completely embedded within said body, said solid heater element having a generally tubular shape, a plurality of projections extending generally perpendicularly from a surface of said solid heater element, said solid heater element including a magnetic alloy unit, and said magnetic



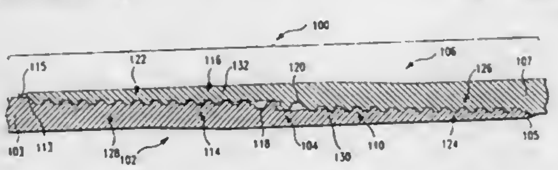
alloy unit having a Curie temperature equal to or higher than said first and second fusion temperatures.

5,462,315
STABILIZED CENTER-SHOULDER-SEALED TUBULAR CONNECTION

Erich F. Klementich, Houston, Tex., assignor to Marubeni Tubulars, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 848,508, Mar. 9, 1992, Pat. No. 5,415,442. This application Jul. 14, 1992, Ser. No. 913,105
Int. Cl.^{6} F16L *35/00*

U.S. Cl. 285—24 **102 Claims**



1. A tubular connection comprising at least two members, wherein each member comprises at least two threaded sections having a center disposed between said at least two threaded sections, said center shoulders sealingly engaging to form a center shoulder seal configuration, said at least two threaded sections including at least one stabilizing thread section present on each connection member adjacent said center shoulder seal configuration engaging threads on the other connection member, said stabilizing thread section comprising a full run-out thread section for stabilizing said center shoulder seal configuration, said threaded sections including threads having means for stabilizing said members during make-up of the connection.

5,462,316
QUICK ACTION FLUID COUPLING

David G. Street, Pottstown; Thomas J. Paff, Valley Forge; Dean A. Thomas, Boyertown, and Joseph P. McGlynn, Glen Mills, all of Pa., assignors to Campbell Fittings, Inc., Boyertown, Pa.

Filed May 19, 1994, Ser. No. 246,117
Int. Cl.^{6} F16L *37/23;35/00*

U.S. Cl. 285—81 **18 Claims**

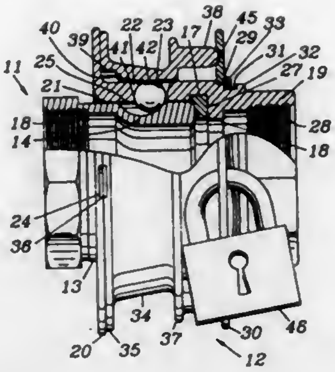
1. A quick action fluid coupling comprising:

male and female coupling members;

said female coupling member having an open end for receiving the male coupling member and a cylindrical wall portion defining a fluid passageway extending axially therethrough, a plurality of circumferentially disposed openings extended through said wall portion, a rotatable spherical camming member loosely retained in each of said openings;

a compressible sealing ring within said passageway on the side of said openings opposite to the open end and a backup shoulder on the side of said sealing ring away from the open end;

an axially moveable collar surrounding the cylindrical wall portion of said female coupling member, said collar being movable between a retracted position and a sealing position, the sealing position being in the direction of said open end, said collar having an internally disposed camming surface portion configured to cam said camming members radially inwardly upon movement of said collar to said sealing position;



said male coupling member being dimensioned to fit within said fluid passageway and having an annular end surface portion adapted to interface with said compressible sealing ring when the male coupling member is inserted into the female coupling member, said male coupling member further having an upwardly open groove circumferentially disposed on its outer periphery, said groove being positioned to receive the camming members and having a camming surface interengaged with the circumferential surface of the camming members when the end surface portion is interfacing with said sealing ring, the internally disposed camming surface portion of said collar being configured to apply a camming force on said camming members effective to hold the camming members in locking relationship with said circumferentially disposed groove and to act on said camming surface of said groove to force said end portion of the male member axially into a sealing relationship with said sealing ring when the axially movable collar is moved to said sealing position;

said camming surface portion of said collar comprising an initial camming surface having a relatively steep slope engageable with said spherical members for moving the spherical members into locking relationship with said circumferentially disposed groove and a second camming surface following the initial camming surface having a relatively gradual slope for forcing said end portion of said male member axially into sealing relationship with said sealing ring, said camming surface portion of said collar further including a third camming surface following said second camming surface, said third camming surface being of relatively gradual slope, the slope of said third camming surface being a reverse slope in relation to the slope of said first and second camming surface, said third camming surface maintaining a compressive force on said gasket sufficient to maintain a seal but being less than the compressive force applied by said second camming surface.

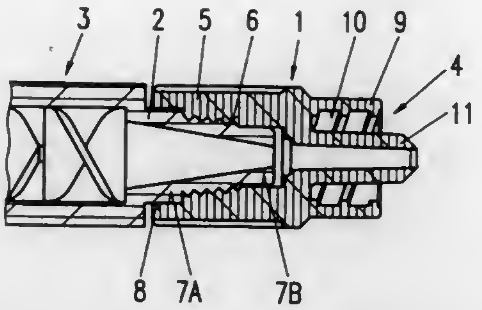
5,462,317
ADAPTER FOR A MIXING OR DISPENSING DEVICE

Wilhelm A. Keller, Obstgartenweg 9, CH-6402 Merlischachen, Switzerland

Filed Mar. 23, 1994, Ser. No. 216,328
Int. Cl.^{6} F16L *25/00;* **B65D** *5/72*

U.S. Cl. 285—177 **17 Claims**

1. An adapter for attachment to an outlet of a device selected from the group consisting of a mixing device and a dispensing device, comprising a connecting part for attachment to said outlet and an outlet portion, wherein said outlet has an external stepped surface, wherein said connecting part comprises an approximately frusto-conical internal surface part having a self-cutting thread for attachment onto the external surface of said outlet of said device,



wherein the connecting part has an internal surface which is stepped, and wherein the self-cutting thread has a central region with at least one adjacent stepped part acting as a guide for cooperating with the external stepped surface of said outlet.

5,462,318
TOGGLE FASTENER

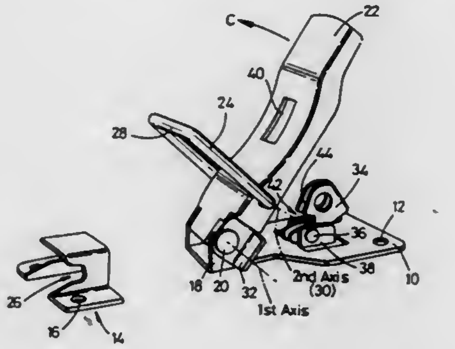
Robert S. Cooke, Broomfield Cottage, Great Britain, assignor to Protex Fasteners Limited, Hereford & Worcester, United Kingdom

Filed Mar. 4, 1994, Ser. No. 206,868

Claims priority, application United Kingdom, Mar. 27, 1993, 93106441

Int. Cl.⁶ E05C *3/06*

U.S. Cl. 292—200 **10 Claims**



1. A toggle fastener comprising a first mounting plate, a hasp lever; and a bail having two ends, said hasp lever having a first end pivotally connected to said first mounting plate for rotation about a first axis, said bail having one end pivotally connected to said hasp for rotation about a second axis, said second axis lying between said first end of said hasp lever and its opposite end; a keeper separate from said mounting plate having means engageable with the second end of said bail; said opposite end of said hasp lever being arcuately movable about said first axis and in a direction toward said first mounting plate so that engagement of said bail by said keeper together with said arcuate movement of said hasp lever toward said mounting plate acts to draw said keeper and mounting plate together into a secured position and bring said bail at least into a common plane with said first and second axes; and abutment means positioned to confront said bail when in said secured position for preventing movement of said bail relative to said hasp lever in a direction toward said mounting plate and about said second axis for retaining said mounting plate, said keeper and said bail in said secured position in opposition to an external force applied to said fastener to urge said bail toward movement in said at least one direction.

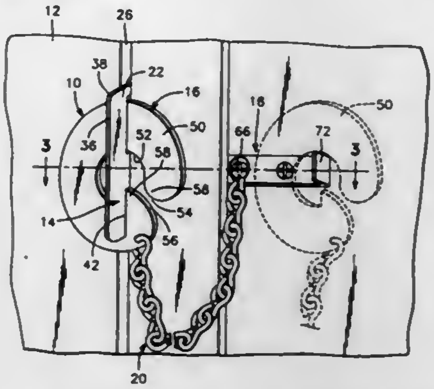
5,462,319
LOCK FOR INSWINGING DOORS

Ralph V. Roden, Jr., P.O. Box 8276, Fort Worth, Tex. 76124

Filed Jun. 17, 1994, Ser. No. 262,028

Int. Cl.⁶ E05C *17/36*

U.S. Cl. 292—264 **13 Claims**



1. A lock for a closure member having an edge portion and a surface portion extending laterally from the edge portion, said closure member being laterally movably associated with a stationary frame defining an opening, said closure member being moveable between a closed position generally aligned with the stationary frame and closing the opening and an open position with the edge portion of the closure member spaced laterally from the frame, said stationary frame having a surface in opposed adjacent relation to said edge portion of the closure member when the closure member is in closed position and a surface area generally in alignment with said surface portion of said closure member when the closure member is in closed position, said lock comprising a retaining member, means mounting said retaining member on said frame surface in opposed relation to said edge portion of said closure member, said retaining member extending laterally beyond said surface portion of the closure member and beyond the surface area on the frame, and a locking member, means mounting said locking member on said retaining member with the locking member extending into overlying relation to said surface portion of said closure member to prevent lateral movement of said closure member from its closed position, said locking member also extending into overlying relation to said surface area of said frame whereby the locking member will engage the surface portion of the closure member and the surface area of the frame to prevent lateral movement of the closure member from its closed position, said retaining member being a retaining plate and said locking member being a locking plate and means mounting the locking plate on the retaining plate to enable movement of the locking plate to a position enabling lateral movement of the closure member toward open position, said means mounting the locking plate on the retaining plate including means enabling separation of the locking plate from the retaining plate, said means mounting the locking plate on the retaining plate including slot means in said retaining plate oriented in laterally spaced but adjacent relation to the surface portion of the closure member and the surface area of the frame when the closure member is in closed position, said locking plate including means positionable through the slot means to removably mount the locking plate on the retaining plate, said slot means including a closed end slot through said retaining plate and an open ended slot through said retaining plate with the two slots being aligned and spaced from each other and the open ended slot having its open end at a bottom edge of said retaining plate, said locking plate being a circular plate having a generally circular central opening, a radial passageway extending between an outer periphery of the circular plate and the periphery of the opening, said passageway being defined by generally convexly curved end edges of said circular plate defining said passageway, the distance between the inner edge of the open ended slot and the adjacent end of the closed slot being slightly less than the diameter of the opening in the locking plate and the thickness of the retaining plate being less than the width of the radial passageway from the periphery of the locking plate to the opening in the locking plate to

enable the locking plate to be connected to the retaining plate by aligning the passageway in the locking plate with the open ended notch and moving the locking plate toward the retaining plate until the end edge defining the passageway aligns with the closed slot and then rotating the locking plate until the passageway is misaligned in relation to the retaining plate.

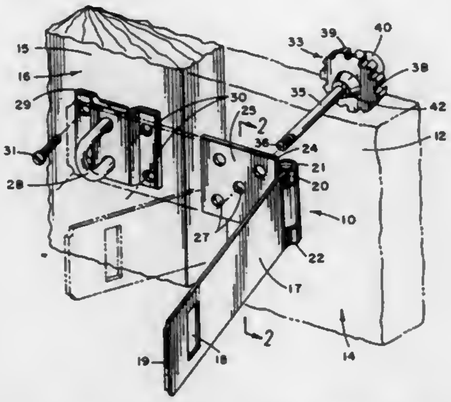
5,462,320
INTERNALLY REMOVABLE SAFETY HASP SYSTEM

Roland L. Davis, 881 W. Forest Brook Rd., Maitland, Fla. 32751

Filed Apr. 15, 1994, Ser. No. 227,967

Int. Cl.^{6} E05C *19/08*

U.S. Cl. 292—285 **3 Claims**



1. A safety hasp installation system, wherein a safety hasp is installed externally on a door and door frame of a walk-in cooler to limit access to a confinement space located internally within the cooler, said system comprising:

said hasp having first and second parts, said first hasp part including a hinge plate with a first aperture, an elongated strap having a free end with a slot and an opposite end pivotally attached to said hinge plate, and said second hasp part including a staple plate with a second aperture, and an eye ring protruding out from said staple plate;

a first threaded fastener passing through said first aperture and attaching said hinge plate to one of said door and door frame;

a second threaded fastener passing through said second aperture and attaching said staple plate to the other of said door and door frame;

said first and second fasteners functioning to position said first and second hasp parts, so that said slot can be brought over said eye ring for locking said door with said strap covering said first and second apertures to block external access to said first and second fasteners; and

at least one of said first and second fasteners being screwed into said corresponding first or second aperture from inside said confinement space toward said corresponding door or door frame; said at least one fastener further comprising a handle located in said confinement space for manually unscrewing said at least one fastener from said corresponding first or second aperture for releasing said attachment of said corresponding hinge plate or staple plate from said door or door frame.

5,462,321
AUXILIARY DOOR LOCK FOR AN OUTWARDLY OPENING DOOR

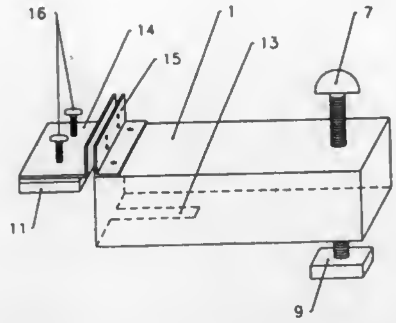
Lloyd J. Osborn, Rte. 1, Box 634, Camp, Ark. 72520

Filed Feb. 14, 1994, Ser. No. 195,208

Int. Cl.^{6} E05C *19/18*

U.S. Cl. 292—288 **3 Claims**

1. An auxiliary lock for outwardly opening doors comprising:



a) a box-like body means with a slot on a lower side of a first end allowing an upper side of said body means to slide over and said lower side of said first end to slide under a doorknob;

b) a tightener bolt threadably installed through a second end of said body means;

c) a door jamb pressure means adjustably connected with said first end of said body means; said door jamb pressure means acting to prevent said door from opening when said tightener means is tightened to raise said second end of said body means to exert pressure to hold said door in a closed position.

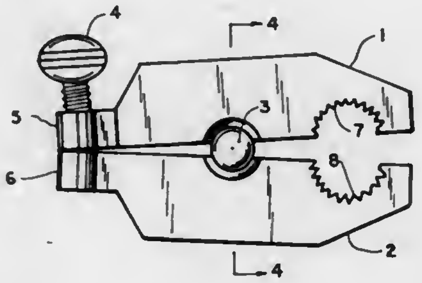
5,462,322
PORTABLE DOOR LOCK

Alex Berezansky, R.D. 2 Box 71, Seward, Pa. 15954

Filed Aug. 3, 1994, Ser. No. 285,284

Int. Cl.^{6} E05B *13/00*

U.S. Cl. 292—288 **1 Claim**



1. A device for clamping a door latch from the inside of a door comprising a pair of clamp halves of a width of less than ⅛ inch wide pivotally connected together by a central pivot, each clamp half having, at one end portion, a substantially semi-circular serrated opening which confronts another substantially semi-circular serrated opening of the other clamp half for surrounding and clamping said door latch when the portions of said clamp halves having said serrated semi-circular openings are projected through the space between a door and door frame, each clamp half at the other end portion, means for pivoting said clamp halves in either direction, comprising a pair of adjoining internally threaded circular portions and a screw for engaging said internally threaded circular portions for selectively clamping or unclamping said serrated semicircular openings.

5,462,323
CAB WINDOW SECURITY DEVICE

Keith G. Benninger, 1-163 Union St East, Waterloo, Ontario, Canada

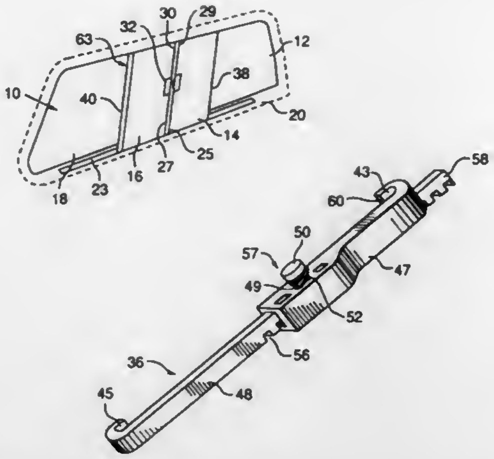
Filed Apr. 11, 1994, Ser. No. 225,807

Claims priority, application Canada, Apr. 13, 1993, 2093883

Int. Cl.^{6} E05C *19/18*

U.S. Cl. 292—292 **13 Claims**

1. A security device for a vehicle, wherein:



the vehicle is of the kind that includes a window, and includes a slideway, with respect to which at least one of a left pane and a right pane of the window is slidable between open and closed positions;

the vehicle is of the kind in which, when the window is in the closed position, the right edge of the left pane and the left edge of the right pane lie together, and the left edge of the left pane and the right edge of the right pane lie apart and facing outwards;

the security device comprises a strut, having complementary left and right components, the components being arranged for relative telescopic sliding, whereby the strut is adjustable in length;

the left component of the strut is formed with a left hook, which is so shaped as to be suitable to be hooked mound the left edge of the left pane, and which, in use of the device on the vehicle, is hooked around the left edge of the left pane;

the right component is formed with a right hook, which is so shaped as to be suitable to be hooked around the right edge of the right pane, and which, in use of the device on the vehicle, is hooked around the right edge of the right pane;

the strut is telescopable in length to the extent that the hooks can fit into engagement with the edges of the panes, and that the hooks can be disengaged from the edges of the panes, when the panes are in the closed position;

the security device includes a manually operable catch, which, when manually operated, is effective to permit movement of the two components in the direction of separation of the hooks, and which, when manually released, is effective to prevent that said movement.

5,462,324
SAFETY GUARD

Mark A. Bowen, Beverly Hills, and Mims Bowen, Santa Monica, both of Calif., assignors to Public Transportation Safety Devices Corp., Los Angeles, Calif.

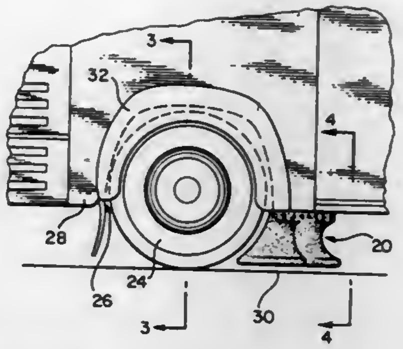
Filed Apr. 15, 1994, Ser. No. 227,928

Int. Cl.^{6} B60R *19/00*

U.S. Cl. 293—15 **13 Claims**

1. In a vehicle having at least two, front steerable wheels, which are spaced in a transverse direction of a body of the vehicle and located rearwardly of a forwardmost side door of the vehicle, and at least one pair of transversely spaced rear wheels which are longitudinally spaced from said front wheels, a safety guard for deflecting animate body parts from in front of at least one of the vehicle's front and rear wheels so as to prevent the animate body parts from being run-over and crushed by the at least one of the vehicle's front and rear wheels comprising:

a frontal guard piece having an upper end portion and a lower end portion which are interconnected by a central body portion, said body portion including an arcuate outer surface, at least a portion of said frontal guard piece being formed frown an elastic material; and



means for mounting said frontal guard piece to the body of the vehicle, at a position spaced a marginal distance in front of the at least one of the vehicle's front and rear wheels, rearward of at least a major portion of the forwardmost side door and a slight distance above a ground surface over which said vehicle travels, with said frontal guard piece projecting downward below the body portion of the vehicle such that animate body parts positioned in front of the at least one of the vehicle's front and rear wheels will be deflected by the frontal guard piece transversely outwardly with respect to the body of the vehicle in order to prevent the animate body parts from being run-over and crushed by the at least one of the vehicle's front and rear wheels during movement of the vehicle over the ground surface, said mounting means including a body mounting member adapted to be secured to the vehicle with said frontal guard piece being arranged at an oblique angle to the transverse direction of the body of the vehicle, said frontal guard piece being fixedly secured to said body mounting member.

5,462,325
BUMPER REINFORCEMENT AND MANUFACTURING METHOD THEREFOR

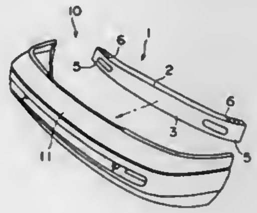
Mitsuo Masuda, and Hiroshi Fujii, both of Shizuoka, Japan, assignors to Yamakawa Industrial Co., Ltd., Fuji, Japan

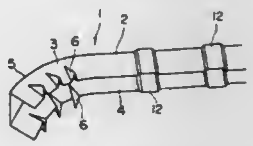
Filed Mar. 10, 1994, Ser. No. 208,144

Claims priority, application Japan, Jan. 13, 1994, 6-014095

Int. Cl.^{6} B60R *19/02*

U.S. Cl. 293—102 **4 Claims**



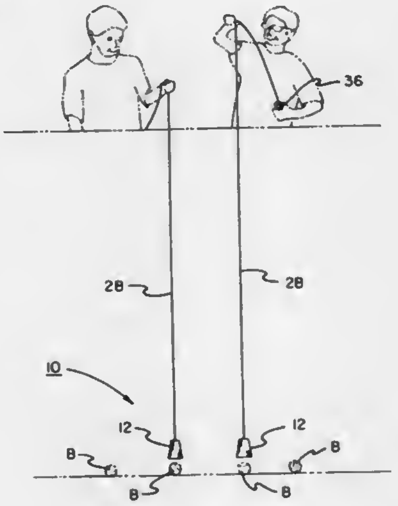


1. A bumper reinforcement mounted on a rear bumper face of a bumper skin formed by bending both end portions of said reinforcement in the same direction as said bumper skin, comprising:

a reinforcement main body made of a long panel having a trough-shaped cross-section along its entire length, and

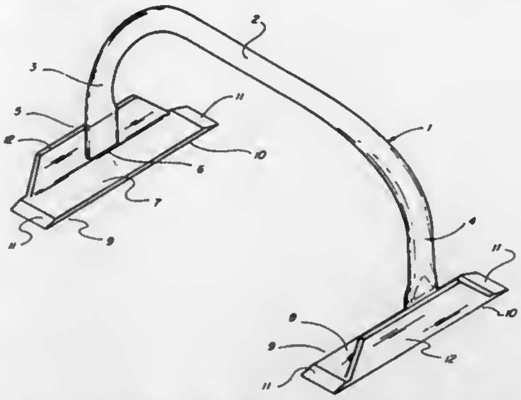
a plurality of ridges respectively expanding toward an open edge of said long panel, said ridges being formed on opposing sides at both end portions of said reinforcement main body for forming curved end portions of the reinforcement main body which fit the shape of said bumper skin wherein an outer circumferential length of the reinforcement main body having the curved end portions is substantially equal to a length of the reinforcement body before the curved end portions are formed.

5,462,326
APPARATUS FOR RETRIEVING BASEBALLS
Scott W. Doherty, 16650 Greenwood Ave., South Holland, Ill. 60473
Filed Sep. 28, 1994, Ser. No. 314,089
Int. Cl.^{6} A63B *47/02*
U.S. Cl. 294—1.1 **2 Claims**



1. A new and improved apparatus for retrieving baseballs, comprising, in combination:
- a cup, the cup having a base with a periphery and a frustroconical side wall secured to the periphery, to thereby form a closed smaller end and an opened larger end, the cup being fabricated of a plastic material with limited resilience and with a diameter at the base of two inches, a diameter at the open end of three inches, and having a height of about six inches whereby the side wall forms an angle of about five degrees when measured from the axis of the cup, such measurements being plus or minus 10 percent, the cup being formed with a small aperture in the center of the base;
- a string having a free end positioned through the aperture in the cup when inverted and a knot formed in the free end within the cup, the string also having a secured end;
- a cylindrical handle for the wrapping of the string, the wrapping of the string beginning with the secured end and an intermediate extent thereof for feeding out string to allow the free end of the string, the knot and cup to be lowered by gravity over a baseball and then re-wrapped on the handle for retrieving the cup and baseball;
- a weight having a hole therethrough positioned in proximity to the small aperture of the cup within the cup whereby lifting the string will cause the string to engage the hole in the weight to lift the weight and the cup; and
- a plurality of disk-shaped washers with circular openings therethrough positioned between the weight and the base of the cup.

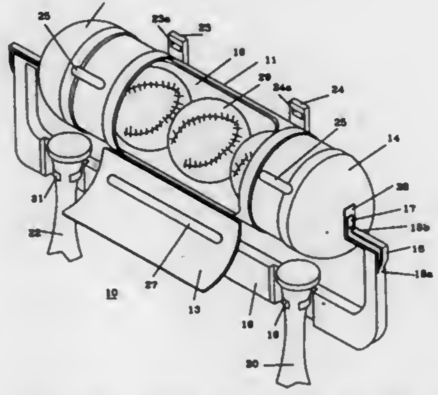
5,462,327
REMOVABLE STEAM TABLE PAN PULLER
Randall A. Quick, 8526 State Rte. 4, Staunton, Ill. 62008
Filed Aug. 1, 1994, Ser. No. 283,814
Int. Cl.^{6} A47J *45/10*
U.S. Cl. 294—27.1 **6 Claims**



1. A removable steam table pan puller, for removing and carrying a steam table pan, said pan having an upper flat outer lip which rests flush to the flat surface of the steam table, comprising:
- (a) a vertical, inverted, essentially rigid essentially U-shaped upper handle having a horizontal upper gripping portion and left and right essentially perpendicular vertical lower legs; and
- (b) left and right essentially rectangular, flat lower, inwardly projecting flanges, attached essentially perpendicularly to the bottom of said left and right lower legs, respectively;

wherein each flange comprises outer and inner long edges, the outer long edge attached to said lower leg, two short front and rear inwardly projecting opposite edges, and an inner edge;
wherein said front and rear opposite edges are tapered downwardly;
whereby the tapered edges of said pan puller flanges may be inserted between the lip of said pan and the surface of said steam table for removing and carrying said pan.

5,462,328
BALL CARRIER APPARATUS
Ricky D. Chandler, and Dixie N. Chandler, both of Rte. 3, Box 123-H, Farmersville, Tex. 75442
Filed Mar. 2, 1994, Ser. No. 204,805
Int. Cl.^{6} A63B *47/00;* **B65D** *71/00*
U.S. Cl. 294—143 **17 Claims**

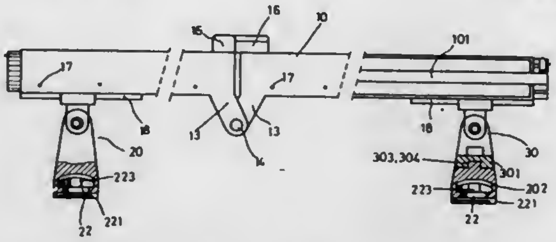


1. A sports utility carrier for holding balls and equipment, comprising:
- a cylindrical housing, having exterior and interior walls, and an opening in one side providing access to the interior of said housing;
- a hinged cover for closing said opening;

- a generally U-shaped handle having a main handle bar and two attachment arms on each end of the main handle bar;
- a pair of studs, one each on opposite ends of said housing for removably securing said handle to said housing; and
- a plurality of ridges extending the length of and internal to said housing for holding balls inside said housing spaced from the interior walls of said housing.

5,462,329
WEATHER PROTECTIVE COVER FOR VEHICLE

Tien-Chu Cheng, No. 65 Shui-Jing St., Yong-Yuan Village, Shin-She Hsiang, Taichung Hsien, Taiwan, Prov. of China
Filed Jan. 3, 1995, Ser. No. 367,720
Int. Cl.^{6} B60J *11/00*
U.S. Cl. 296—98 **3 Claims**

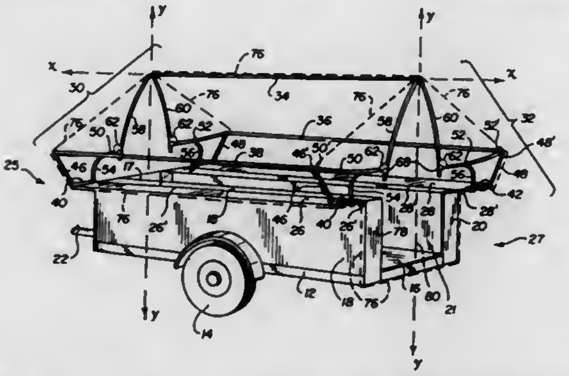


1. A protective cover for a vehicle comprising:

- two bases for securing on top of said vehicle, said bases each including a first engaging means provided thereon,
- a reel including two ends each having a track means provided thereon,
- two studs each including a channel means formed therein for slidably engaging with said track means of said reel,
- two connectors pivotally coupled to said studs respectively and each including a bottom portion having a room formed therein for engaging with said bases, said connectors each including a second engaging means provided in said rooms for engaging with said first engaging means so as to secure said connectors to said bases, one of said connectors including an upper member pivotally coupled to said stud and having a lower member rotatably coupled to said upper member, said room being formed in said lower member of said one of said connectors, and said first engaging means being engaged with said second engaging means when said lower member is rotated.

5,462,330
FOLDING CAMPING/CARGO TRAILER

Quentin M. Brown, 20 ½ College St., Clinton, N.Y. 13323
Filed Aug. 23, 1993, Ser. No. 109,947
Int. Cl.^{6} B60P *3/34*
U.S. Cl. 296—172 **19 Claims**

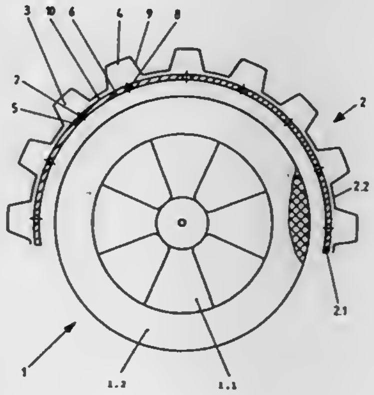


9. A foldable frame for supporting wall means defining an enclosure of relatively smaller and larger volumes when said frame is in folded and erected positions, respectively, said frame having a longitudinal centerline and comprising:

- a) front and rear, central linkages each including a pair of elongated members extending from fixedly connected first ends to laterally spaced second ends;
- b) a longitudinal member having opposite ends fixedly connected to said first ends of said front and rear, central linkages, respectively;
- c) front and rear right side linkages pivotally connected to respective ones of said elongated members of said front and rear, central linkages for movement with respect thereto simultaneously about first and second, spaced axes, each parallel to and respectively movable and fixed with respect to said longitudinal centerline; and
- d) front and rear, left side linkages pivotally connected to the respective others of said elongated members of said front and rear, central linkages for movement with respect thereto simultaneously about third and fourth, spaced axes, each parallel to and respectively movable and fixed with respect to said longitudinal centerline.

5,462,331
WHEEL LINING

Reinhard Stief, Weinheim; Gerhard Müller-Broll, Rimbach; Thomas Jost, Weinheim; Manfred Mattutat, Ladenburg, and Klaus-Dieter Schmitt, Gorxheimertal, all of, Germany, assignors to Firma Carl Freudenberg, Weinheim, Germany
Filed Dec. 9, 1993, Ser. No. 164,587
Claims priority, application Germany, Dec. 10, 1992, 42 41 518.7
Int. Cl.^{6} B62B *9/14*
U.S. Cl. 296—198 **12 Claims**



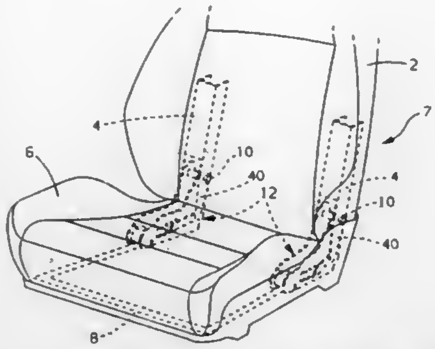
1. A wheel lining mounted at a distance from a wheel comprising a structure having a first wall made of a material impermeable to air facing the wheel and a second wall facing away from the wheel, the structure having at least two chambers formed between the first and second walls, each chamber having at least one opening facing the wheel so as to form a Helmholtz resonator.

5,462,332
HIGH STRENGTH VEHICLE RECLINER SEAT

Scott T. Payne, Rochester Hills; Gary A. Wize, Shelby Township, and James E. Carl, Sterling Heights, all of Mich., assignors to General Motors Corporation, Detroit, Mich.
Filed Oct. 3, 1994, Ser. No. 316,775
Int. Cl.^{6} B60N *2/42*
U.S. Cl. 297—216.1 **5 Claims**

5. A recliner seat for a vehicle comprising:

- a first frame member providing a bun frame;
- a second frame member providing a seat back pivotally mounted with respect to the first frame member;



- a rotatable drive screw having a first end held by a first fixture and a second end held by a second fixture, the first fixture being rotatable with respect to the first frame member and the second end being generally fixed with respect to the first frame member, the first and second fixtures holding the drive screw along a first linear axis;
- a nut with a projecting pin, the nut threadably encircling the drive screw and being moved by the drive screw along the first linear axis;
- a saw tooth surface fixed with respect to the first frame member; and
- a link pivotally connected with respect to the second frame member and the nut wherein a loading on the seat back exceeding a predetermined amount causes the link to pull on the pin to move the nut to a position nonaligned with the first linear axis, moving the pin to locking engagement with the saw tooth surface, thereby retarding angular movement of the seat back.

5,462,333

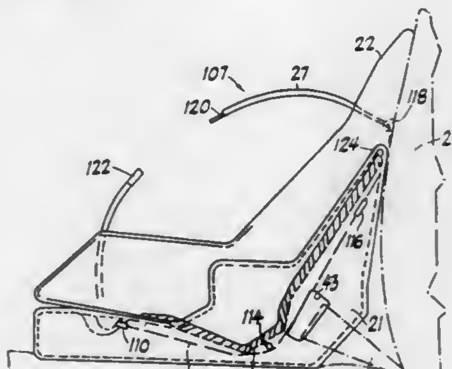
CHILD SAFETY SEAT

Randall Beauvais, Fenton, Mo., assignor to Life Forece Associates, LP, Fenton, Mo.

Continuation-in-part of Ser. No. 260,598, Oct. 28, 1988, Pat. No. 5,110,182. This application Jan. 31, 1992, Ser. No. 831,199

Int. Cl.^{6} B60N *2/42*

U.S. Cl. 297—216.11 **22 Claims**



1. A child safety seat for holding a child, the seat being installed on a seat of a vehicle that is subject to sudden deceleration, the child safety seat comprising:

- a base section having means for releasably mounting the base section onto the vehicle seat;
- a seat section;
- a linkage connected between the seat section and the base section for providing relative movement between the seat section and the base section upon sudden deceleration of the vehicle, wherein the relative movement provided by the linkage connected between the seat section and the base section provides upward and forward motion of the forward and rearward portions of the seat section relative to the base section;
- a restraining member selectively coupleable around the child for restraining the child in the child safety seat; and
- a restraining member tightening device for tightening the restraining member around the child upon motion of the seat section relative to the base section.

5,462,334

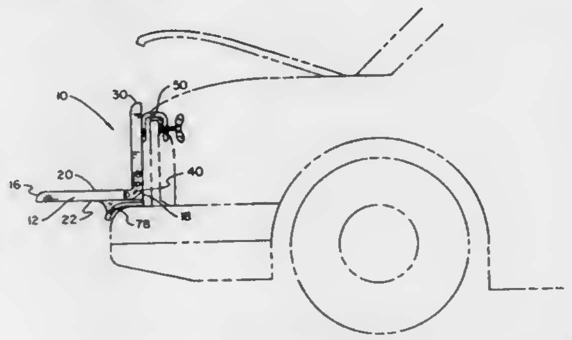
SPORT UTILITY SEAT FOR REMOVABLE ATTACHMENT TO AN OPEN TRUCK AND BUMPER OF AN AUTOMOBILE

Frank J. Sedorcek, and Jacqueline J. Sedorcek, both of 5644 Walmer St., Mission, Kans. 66202

Filed Apr. 5, 1994, Ser. No. 223,009

Int. Cl.^{6} A47C *1/08*

U.S. Cl. 297—252 **1 Claim**



1. A new and improved sport utility seat for removable attachment to an open truck and bumper of an automobile comprising, in combination:

- a seat portion formed in a rectangular configuration and positionable in a horizontal orientation with side edges and a front and a rear edge and with an upper surface and a lower surface;
- a back portion formed in a rectangular configuration and positionable in a vertical orientation with a front surface, side edges and a top and bottom edge and with a rear surface, the top and bottom edges being of a length essentially equal to the front and rear edges of the seat portion and with the side edges of the back portion being of a length less than the side edges of the seat portion;
- a pair of hinges secured to the lower side edges of the back portion and the rear side edges of the seat portion, each hinge including a pair of pins secured through the hinge and coupled to the back portion with a single pivotable pin coupling the lower portion of the hinge and the seat portion forwardly of the front surface of the back portion to thereby allow the upward pivoting of the seat portion into a parallel orientation with the back portion;
- a pair of inverted U-shaped clamping members with vertical legs and a cross piece secured to the rear surface of the back portion with two associated coupling bolts for each member, the upper extent of each member being at a height beneath the upper edge of the back portion and extending downwardly to a central extent of the back portion with a cover sheet secured to the interior surface of one leg of the member to cover the heads of the bolts;
- an adjustable wing nut extending through the leg of each member remote from the bolts and adjacent to a lower extent thereof with a hemispherical cup secured to the free end of the nut interior of the member with an operator control member exterior thereof; and
- a support bracket extending downwardly from the lower surface of the seat portion in an arcuate configuration for resting on the bumper of an automobile when the inverted U-shaped member is secured to the rear of the trunk area when the trunk is open.

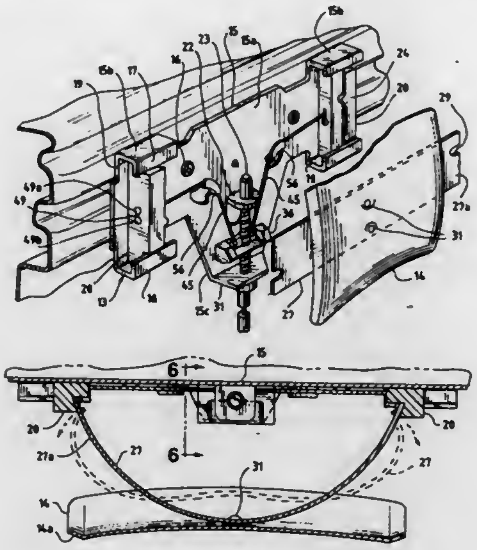
5,462,335
ADJUSTABLE LUMBAR SUPPORT FOR SEAT BACKS

Peter G. Seyler, Franklin Park, Ill., assignor to Perfection Spring & Stamping Corp., Mt. Prospect, Ill.

Filed Aug. 18, 1994, Ser. No. 292,528

Int. Cl.^{6} A47C *7/46*

U.S. Cl. 297—284.4 **25 Claims**



1. An adjustable lumbar support assembly for attachment to a seat back frame, comprising a mounting bracket adapted for connection to a seat back frame; said bracket including a central portion and a pair of laterally-spaced side portions defining a pair of aligned, horizontally-spaced channels; a pair of glide blocks mounted for horizontal sliding movement along said channels; a curved, horizontally-elongated leaf spring having a mid-portion bowed away from said bracket and having opposite end portions operatively connected to said glide blocks; said bracket including means for rotatably supporting a threaded shaft; means operatively connecting said glide blocks and threaded shaft for movement of said blocks toward and away from each other as said shaft is selectively rotated in one direction and in a direction opposite from said one direction; a contoured back support plate connected to said leaf spring intermediate the ends thereof; and control means for selectively rotating said shaft in opposite directions for shifting said glide blocks to adjust the extent of curvature of said leaf spring.

5,462,336
OFFICE CHAIR HAVING A SUPPORT MEMBER FOR SHIFTABLY SUPPORTING A SEAT

Simon Desanta, Schlossallee 18, D-33829 Borgholzhausen, Germany

PCT No. PCT/EP93/00644, § 371 Date Jan. 19, 1994, § 102(e) Date Jan. 19, 1994, PCT Pub. No. WO93/18687, PCT Pub. Date Sep. 30, 1993

PCT Filed Mar. 18, 1993, Ser. No. 142,296

Claims priority, application Germany, Mar. 20, 1992, 42 09 066.0

Int. Cl.^{6} A47C *3/20*

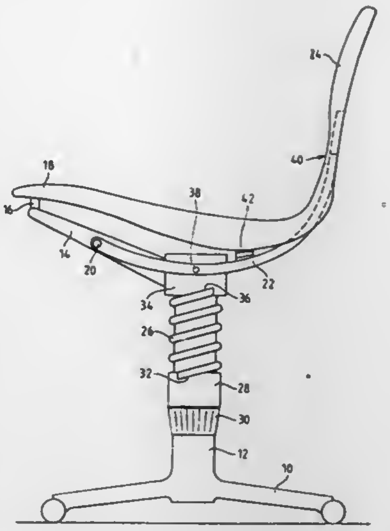
U.S. Cl. 297—302.4 **8 Claims**

1. An office chair, comprising:

a pedestal;

a vertical column rising from said pedestal and having an upper end;

a bracket having a front end, a rear end fixed to the upper end of said vertical column so that said bracket projects therefrom, said bracket having a central portion between said front end and said rear end;



a seat having a rear end portion, a central portion, and a front end portion pivotally supported by the front end of said bracket for pivoting around a first transverse pivot axis, said seat being positioned over the upper end of said column;

a back rest connected to said seat;

a support member journaled to a second transverse pivot axis located in the central portion of said bracket to be resiliently supported by at least one of said bracket and said column, said support member extending below said seat to shiftably support the rear end portion of said seat, and extending up to said back rest to carry said back rest;

a helical spring surrounding said column; and

a sleeve shiftably mounted on said column, pivotally connected to said support member to support said support member, and resting on said helical spring, said sleeve including an opening through which said bracket projects.

5,462,337
POWER SEAT DRIVING APPARATUS FOR A VEHICLE

Gensaku Yamakami, Seta, Japan, assignor to Matsuba Electric Manufacturing Co., Ltd., Kiryu, Japan

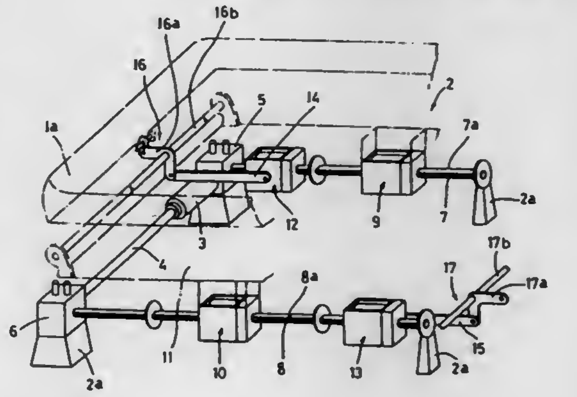
Filed Sep. 3, 1993, Ser. No. 115,559

Claims priority, application Japan, Sep. 4, 1992, 4-262829

Int. Cl.^{6} B60N *2/02*

U.S. Cl. 297—344.13 **12 Claims**

1. A power seat driving apparatus for a vehicle, comprising:



a seat section;

an electric motor mounted in said seat section;

a plurality of operating threaded shafts having a locking section which are rotated by said electric motor; and a plurality of nut members which are connected to said seat section, each nut member threadably received on an operating threaded shaft of said plurality of operating threaded shafts, the power seat driving apparatus being structured to move said seat section back and forth relative to said plurality of operating threaded shafts by a movement of at least one said nut member, each said nut member driven by said operating threaded shaft to which it is mounted by the normal or reverse rotation of said electric motor, at least two additional nut members being mounted to at least one of said plurality of operating threaded shafts to selectively achieve a different adjustment of said seat section from the adjustment of a forward and backward position of said seat section by the movement of said at least two additional nut members relative to said at least one operating threaded shaft to which it is mounted, all said nut members cooperating with said operating threaded shaft to which it is mounted and on whose circumference said locking section is formed, each said nut member having:

a casing through which said operating threaded shaft to which said nut member is mounted passes;

a nut body which is housed in said casing and which is threadably and rotatably supported by said operating threaded shaft to which said nut member is mounted in the axial dimension thereof;

a first clutch body through which said operating threaded shaft to which said nut member is mounted passes, said first clutch body being non-rotatably but axially movable with respect to said nut body and which is provided on one side of said nut body so that said clutch body is capable of being engaged with said one side of said nut body;

a second clutch body through which said operating threaded shaft to which said nut member is mounted passes, said second clutch body engaged with said locking section of said operating threaded shaft to which said nut member is mounted so as to rotate together with said operating threaded shaft to which said nut member is mounted, is capable of being engaged with a second side of said nut body and which is further capable of moving axially relative to said nut body;

a connecting lever which supportedly connects said first and second clutch bodies which are located facing each other on opposite ends of said nut body, said connecting lever having an interval which makes one clutch body disengage from said nut body when the other clutch body is engaged with said nut body; and

a clutch operating means for switching said first and second clutch bodies between a first shift condition where said first clutch body is engaged with said nut body and a second shift condition where said second clutch body is engaged with said nut body.

5,462,338

ADJUSTABLE ARM CONTROL

Stephen J. Baumann, Green Bay, Wis., assignor to Krueger International, Inc., Green Bay, Wis.

Filed Apr. 1, 1994, Ser. No. 222,467

Int. Cl.⁶ A47C *7/54*

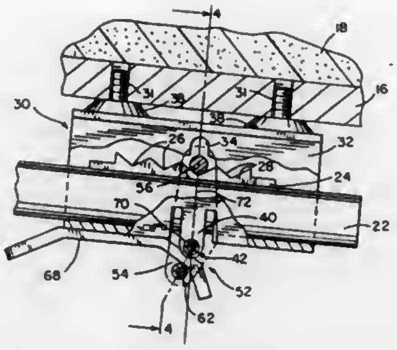
U.S. Cl. 297—411.37 15 Claims

1. In combination, a seat, an armrest mounted thereto, and a mechanism for adjusting the armrest relative to the seat, the mechanism comprising:

a support member having the armrest mounted on a first end thereof and locking track secured on a second end thereof;

a mounting plate assembly fixed to the seat for slidably receiving said support member and said locking track, said mounting plate assembly having a first bearing assembly; and

a leveraged clamping linkage movably secured to said mounting plate assembly and including a pair of shiftable links interconnected by a locking pin which is selectively engageable and disengageable between said locking track and said mounting plate assembly for permitting independent adjustment of said support member and the armrest in various positions relative to the seat and allowing removal of said support member and said armrest relative to the seat, said clamping linkage further comprising a second bearing assembly connecting said links, and an over the center lever disposed between said first bearing assembly and said second bearing assembly for pivotal movement about said first bearing assembly to shift said links and move said locking pin upwardly and downwardly with respect to said locking track.



5,462,339

SITTING SECTION OF A VEHICLE SEAT

Gerhard Schmale, Huckeswagen; Norbert Sommer, Wermelskirchen, and Martin Zynda, Remscheid, all of, Germany, assignors to Naue/Johnson Controls Engineering Verwaltungs GmbH, Germany

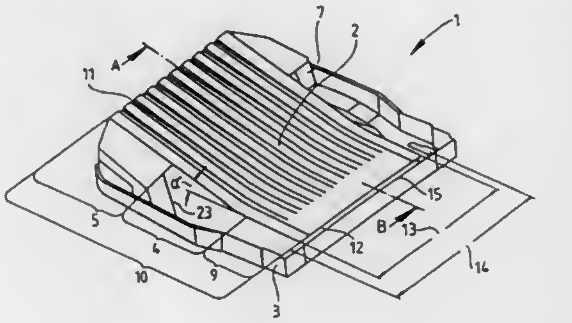
PCT No. PCT/EP92/01839, § 371 Date Feb. 22, 1994, § 102(e) Date Feb. 22, 1994, PCT Pub. No. WO93/04892, PCT Pub. Date Mar. 18, 1993

PCT Filed Aug. 12, 1992, Ser. No. 196,129

Claims priority, application Germany, Aug. 30, 1991, 41 28 954.4

Int. Cl.⁶ A47C *7/02;7/18*

U.S. Cl. 297—452.55 9 Claims



1. A seating section of a vehicle seat comprising: a frame having a rear edge, a thin-walled seat shell arranged thereon, said seat shell having a front edge and a free back edge, and on said seat shell an elastic seat pad of foamed material, rubberised hair or the like, wrapped in a cover material, said seat shell having a forward region, a middle region and a rear region, said thin-walled seat shell being securely fixed to said frame by said forward region and said middle and rear regions being able to flex downwardly relative to said forward region and to said frame with said back edge of said seat shell moving downwardly relative to said rear edge of said frame, at least said middle region extending upwardly forwards at an angle (α) of about 15°, and said seat shell having a plurality of parallel, longitudinally extending depressions therein forming channels which extend from said front edge towards said back edge and which terminate forwardly of said back edge of said seat shell and forwardly of said rear edge of said frame.

5,462,340
PRELOADER FOR A WEBBING RETRACTOR

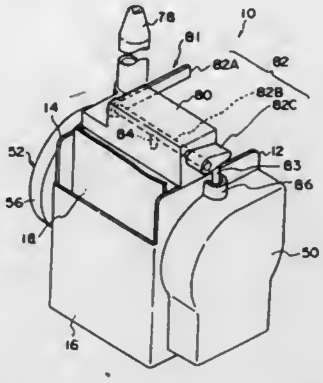
Keisuke Imai, and Naohiro Tsukiyama, both of Aichi, Japan, assignors to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho, Aichi, Japan

Filed Oct. 8, 1993, Ser. No. 133,365

Claims priority, application Japan, Jan. 12, 1992, 4-070946 U

Int. Cl.^{6} A62B *35/00*

U.S. Cl. 297—478 **20 Claims**



18. A webbing retractor having a webbing for restraining an occupant in an emergency of a vehicle comprising:

a frame;

a webbing take-up shaft mounted on said frame;

a lock wheel supported on one end of said webbing take-up shaft by a predetermined urging force and rotated so as to follow up said webbing take-up shaft;

locking means for delaying rotation of said lock wheel with respect to said webbing take-up shaft to prevent said webbing take-up shaft from being rotated in a webbing pulling-out direction;

acceleration responding means for applying rotational resistance to said lock wheel when a vehicle acceleration becomes large;

a preloader disposed so as to correspond to another end of said webbing take-up shaft and forcibly rotating said webbing take-up shaft in a webbing winding direction upon application of a predetermined acceleration; and

controlling means which is manually operated so as to switch from a state in which said preloader is made inoperable and the rotational resistance is applied to said lock wheel to a state in which said preloader is made operable and application of the rotational resistance to said lock wheel is not applied.

5,462,341
PROPORTIONING VALVE

Hitoshi Koyano, and Shozo Sakaguchi, both of Higashimatsuyama, Japan, assignors to Jidosha Kiki Co., Ltd., Tokyo, Japan

Filed Mar. 25, 1994, Ser. No. 217,875

Claims priority, application Japan, Apr. 9, 1993, 5-082952; Jan. 27, 1993, 5-268528

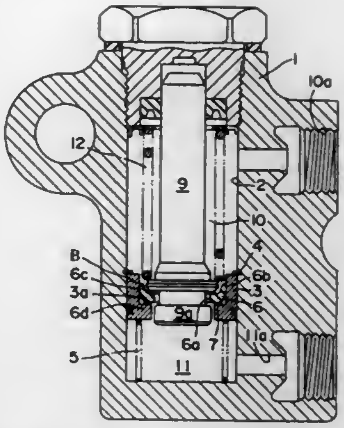
Int. Cl.^{6} B60T *8/26*

U.S. Cl. 303—9.75 **4 Claims**

1. In a proportioning valve including a valve seat disposed in a cylinder bore of a housing, a valve body disposed on a plunger in said bore engageable with said valve seat and defining an input pressure chamber and an output pressure chamber in said cylinder bore on opposite sides of said valve body, and a first spring in said input pressure chamber between said housing and said plunger for urging said plunger toward an open valve position when the pressure in said output pressure chamber is lower than a predetermined pressure to allow fluid flow between said pressure chambers, the improvement comprising:

an annular piston slidably mounted in said cylinder bore;

said valve seat being disposed on said annular piston;



a second spring installed in said output pressure chamber between said housing and said annular piston for urging said piston toward said input pressure chamber and for positioning said piston at a predetermined position, so that said valve body engages against said valve seat to close said valve and prevent fluid flow between said pressure chambers when the pressure in said input pressure chamber is increased, said piston moves toward said output pressure chamber against the force of said second spring when the pressure in said input pressure chamber is further increased, and said piston returns toward said input pressure chamber when the pressure in said input pressure chamber is decreased.

5,462,342
ELECTRONIC BRAKE SYSTEM FOR SEPARATELY CONTROLLING NONDRIVEN FRONT WHEELS AND DRIVEN REAR WHEELS

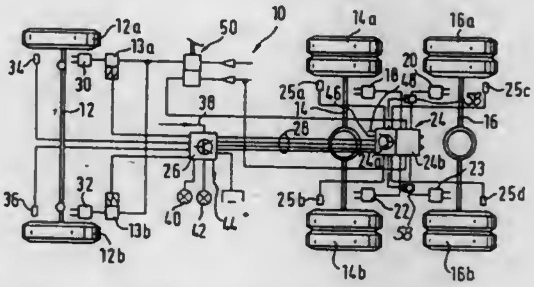
Hermann Goebels, Schwieberdingen, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Aug. 17, 1993, Ser. No. 106,956

Claims priority, application Germany, Aug. 17, 1992, 42 27 083.9

Int. Cl.^{6} B60T *8/60;13/66;17/00*

U.S. Cl. 303—113.2 **10 Claims**



1. An electronic brake system, for road vehicles, having an electronic system serving to trigger brake pressure modulators and subdivided into units, each said unit containing at least one microcomputer, the electronic system being split into first and second electronic units (**24***a*, **26**); said first electronic unit (**24***a*) is formed by a two-channel pressure regulating module (**24**); said second electronic unit (**26**) is assigned to up to two separate pressure control valves (**13***a*, **13***b*); said first and second electronic units (**24***a*, **26**) further include electronic components in addition to the at least one microcomputer, said electronic components being disposed so that each of said first and second electronic unit (**24***a*, **26**) processes from one up to four wheel speed data and regulates from one up to two brake pressures individually, said first electronic unit (**24***a*) is assigned to at least one driven rear axle and is part of the pressure control module (**24**) which feeds brake pressure into the brakes of the rear wheels to control the driven axles

and for brake modulation, and the second electronic unit (26) controls the brake pressure fed by a brake valve transducer (50) to control the brakes of the wheels on the nondriven axle; and further each said first and second electronic unit (24*a*, 26) has at least one interface (28), whereby information and signals are exchanged between the first and second electronic units (24*a*, 26) and exchanged with further electronic and electrical systems.

5,462,343

HYDRAULIC PRESSURE BOOSTER HAVING BOOSTER PISTON AND VALVE MECHANISM ASSOCIATED WITH MECHANICALLY OPERATED AND ELECTRICALLY CONTROLLED PRESSURE REGULATORS

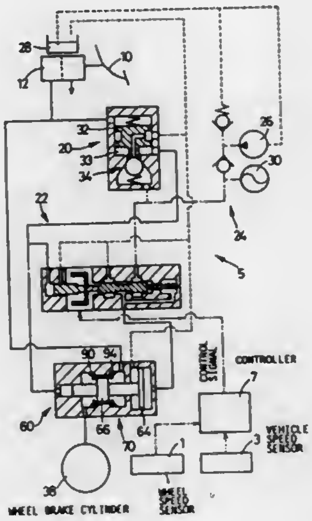
Hiroaki Yoshida, Mishima; Masashi Ohta, Susono, and Akira Nakamura, Tagata, all of, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Nov. 14, 1994, Ser. No. 338,862

Claims priority, application Japan, Nov. 18, 1993, 5-289215

Int. Cl.⁶ B60T *8/32*

U.S. Cl. 303—114.1 **18 Claims**



1. A pressure boosting device provided in a hydraulically operated system wherein the pressure boosting device is connected to a mechanically operated pressure control device, an electrically controlled pressure control device and a hydraulically operated actuator, said mechanically operated pressure control device producing a manually controlled hydraulic pressure whose level is regulated depending upon an operating force acting on the mechanically operated pressure control device, while said electrically controlled pressure control device producing an electrically controlled hydraulic pressure whose level is electrically regulated, said pressure boosting device comprises:

a stepped booster piston for boosting said electrically controlled hydraulic pressure produced by said electrically controlled pressure control device, so that the boosted electrically controlled hydraulic pressure is applied to said hydraulically operated actuator; and

a valve mechanism operated according to a movement of said booster piston, said valve mechanism having an open position in which said actuator communicates with said mechanically operated pressure control device, and a closed position in which said actuator is disconnected from said mechanically operated pressure control device and in which said booster piston is permitted to boost said electrically controlled hydraulic pressure, said valve mechanism being placed in said open position when said booster piston is placed in an original position thereof, and in said closed position when said booster piston is moved from said original position.

5,462,344

VALVE SUBASSEMBLY FOR A SLIP-REGULATED HYDRAULIC BRAKE SYSTEM

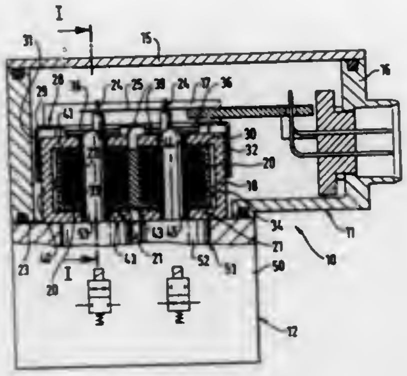
Gert Jakob, Stuttgart, and Ralph Schimitzek, Moeckmuehl, both of, Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Jan. 24, 1994, Ser. No. 185,080

Claims priority, application Germany, Mar. 4, 1993, 43 06 769.7

Int. Cl.⁶ B60T *8/32;13/66;* **F16B** *13/08;* **F16K** *31/06*

U.S. Cl. 303—119.2 **5 Claims**



1. A pressure regulating device (10) for a slip-regulated hydraulic brake system which comprises:

a first subassembly (11) including a housing frame (16) which receives two rows of coils (20) of electromagnetically actuatable valves (21),

a second subassembly (12) is provided with a hydraulic part (51) of the valves (21), which includes a valve body (52) and a valve dome (53) which functions as a control for the valves,

said first and second subassemblies (11, 12) adjoin one another at a mounting surface (23) with said first subassembly aligned above said second subassembly, so that the valve dome (53) of the hydraulic part (51) rises above the mounting surface (23) and extends through an associated coil (20),

the coils (20) are embedded in a block-shaped component (18),

the block-shaped component (18) includes the coils (20) and is fastened on component ends to protrusions (17) in a fixed position on a wall of the housing frame (16) with a bracket (28) disposed between said protrusions (17) and the block-shaped component (18),

the block-shaped component (18) is encompassed in a region of the coils (20) by at least one magnetic-flux-conducting, U-shaped iron part (39), having play on all sides, wherein legs (41, 42) of the iron part (39) extend parallel to the mounting surface (23) and are provided with openings (44, 45) for at least one valve dome (53),

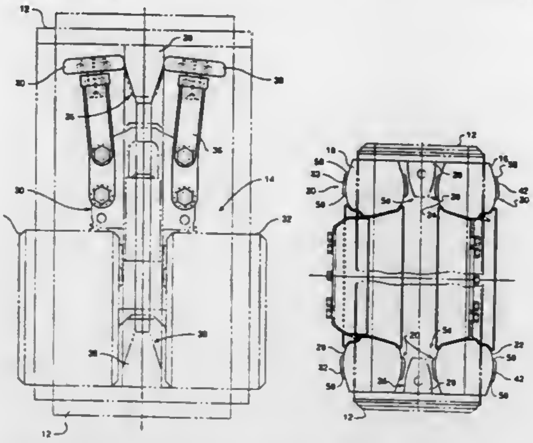
in a region remote from the mounting surface (23), the block-shaped component (18) and the at least one iron part (39) are overlapped by the bracket (28), which with one leg (31) runs along an outside of a yoke (40) of the iron part (39) and with at least one spring tongue (36) engages the leg (41) of the iron part (39) remote from the mounting surface (23), so that this iron part (39) is frictionally supported against the second subassembly (12), and

the leg (42) is remote from the bracket (28) of the at least one iron part (39) and is frictionally supported against at least one magnetic-flux-conducting valve body (52) of the second subassembly (12), and the leg (42) protrudes beyond the mounting surface (23) of the first subassembly (11) when the first subassembly (11) is separate from the second subassembly (12).

5,462,345
RESILIENT WHEELS WITH REINFORCING RINGS

Robert J. Purcell, Washington, Ill., assignor to Caterpillar Inc., Peoria, Ill.

Filed Apr. 29, 1994, Ser. No. 236,277
Int. Cl.^{6} B62D *55/14*
U.S. Cl. 305—56 **11 Claims**



1. Apparatus for supporting and guiding an endless elastomeric drive belt of a belted undercarriage assembly said drive belt having a guiding portion, comprising:
   a resilient wheel having first and second spaced apart side wall portions, said wheel being adapted to contact said drive belt, and also being adapted to be mounted to said undercarriage assembly adjacent said guiding portion; and
   a plurality of substantially similar spaced resilient pads connected to one of said side wall portions of said resilient wheel, each pad being bonded to a side wall portion of the resilient wheel.

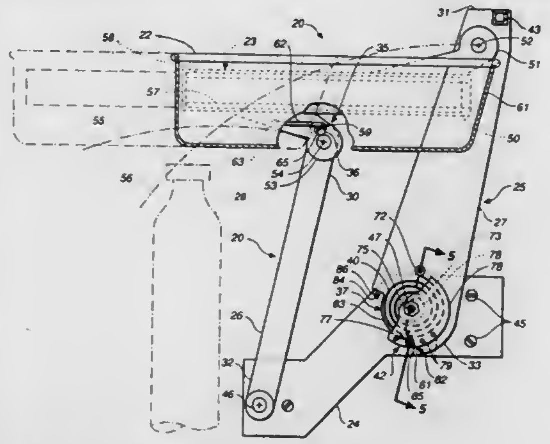
5,462,346

Patent Not Issued For This Number

5,462,347
PULL DOWN STORAGE SHELF ASSEMBLY

Doug Vogelgesang, P.O. Box 2564, and Douglas Ching, P.O. Box 1388, both of Kailua-Kona, Hi.

Continuation-in-part of Ser. No. 932,984, Aug. 20, 1992, Pat. No. 5,308,158. This application Dec. 6, 1993, Ser. No. 162,277
Int. Cl.^{6} A47F *5/08*
U.S. Cl. 312—247 **24 Claims**

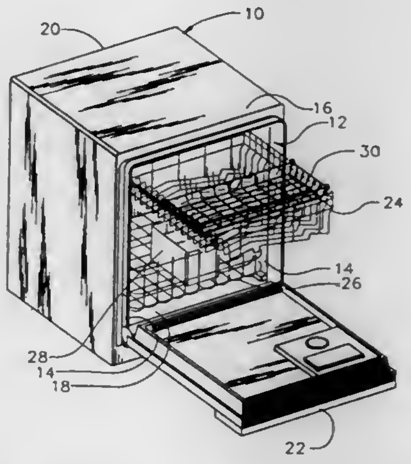


1. A pull down shelf assembly comprising:
   a shelf guide track mechanism;
   a storage shelf member mounted to said track mechanism for movement between an extended position and a retracted position;
   a pantographic assembly including a shelf mounting bracket member formed for mounting of said shelf assembly to a support member, and a pair of arms pivotally mounted at first ends to said track mechanism at spaced apart locations and pivotally mounted about a pivotal axis at second ends to said mounting bracket member at spaced apart locations, said pair of arms being mounted to said mounting bracket member and said track mechanism at locations producing pantographic movement of said track mechanism with said shelf member carried thereby and oriented in a near-horizontal orientation throughout an arcuate path between a deployed position and an elevated stored position; and
   a shelf locking mechanism including a pin member movably mounted to one of said track mechanism and one arm of said pair of arms between a disengaged position and an engaged position, positioning said pin member for contact with said shelf member to prevent said shelf member from moving from said extended position upon movement of said track mechanism between said elevated stored position and said deployed position.

5,462,348
DISHWASHER UTENSIL TRAY

David I. Ellingson; Daryl A. Michael, both of Newton, Iowa, and William M. Nelms, Cleveland, Tenn., assignors to Maytag Corporation, Newton, Iowa

Continuation of Ser. No. 779,394, Oct. 18, 1991, abandoned. This application Dec. 20, 1993, Ser. No. 170,440
Int. Cl.^{6} A47B *77/14*
U.S. Cl. 312—301 **22 Claims**



1. A utensil holder in combination with a dishwasher having opposite side walls, a rear wall, a front door, and at least one rack with an upper perimeter edge, the rack being movably mounted between the side walls for forward and rearward movement, the utensil holder comprising:
   a tray for holding utensils to be washer;
   tray support means for independently movably supporting the tray on the upper perimeter edge of the rack during loading of the utensils, the tray being horizontally movable relative to the rack and between a front position and a rear position completely within the confines of the perimeter edge of the rack; and
   the support means including rollers for rollably supporting the tray on the rack.

5,462,349
DRAWER WITH DRAWER SIDE SLIDE AND DRAWER BOTTOM

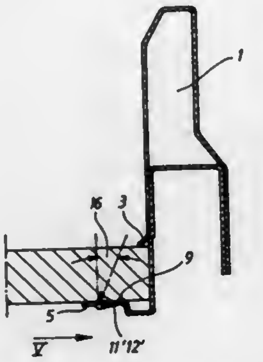
Günther Grabher, Fussach, Austria, assignor to Grass AG, Hoechst/Vlbg., Austria

Filed Mar. 16, 1994, Ser. No. 213,940

Claims priority, application Germany, Mar. 17, 1993, 9303903 U

Int. Cl.⁶ A47B *88/04*

U.S. Cl. 312—348.1 **9 Claims**



1. A drawer side slide with fastening device for mounting a drawer bottom, comprising:

an elongate drawer side having a vertically upstanding portion and a longitudinally extending bottom edge provided with a horizontal support shank; and

a tab pressed out of the support shank and partially defined by a pair of elongate open ended slots formed in the support shank, the tab having at least one pair of upwardly directed grips for inserting into the drawer bottom and having at least one upwardly directed knob for supporting the drawer bottom.

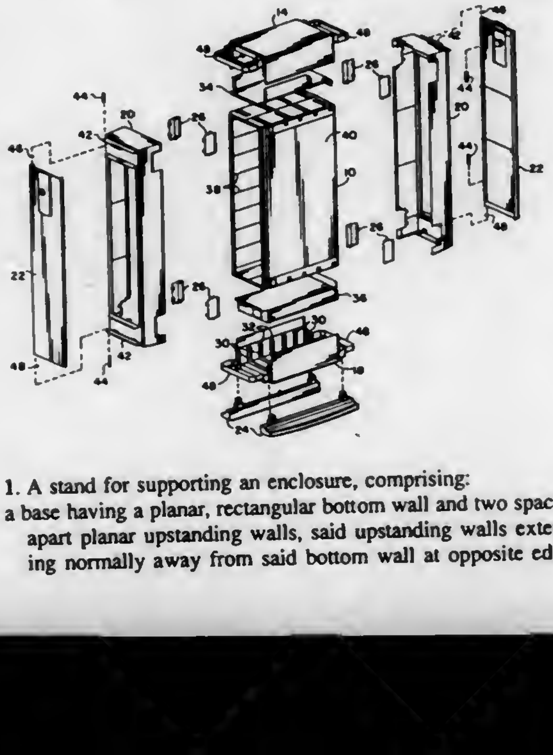
5,462,350
EQUIPMENT CABINET STAND

Timothy H. Brightman, Franklin; Kenneth Gulick, Lunenburg; Robert L. Hanson, Marlboro; Brian R. Herrick, Lunenburg; Edwin A. Jeffery, Natick, all of Mass.; Maria J. Kozo, Maryville, Tenn., and Carl A. Swanson, Clinton, Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Nov. 23, 1993, Ser. No. 156,177

Int. Cl.⁶ A47B *95/00*

U.S. Cl. 312—351.7 **22 Claims**



1. A stand for supporting an enclosure, comprising:

a base having a planar, rectangular bottom wall and two spaced-apart planar upstanding walls, said upstanding walls extending normally away from said bottom wall at opposite edges thereof, said bottom wall and upstanding walls forming a space in which said enclosure is to be received; and

two spaced-apart elongated feet each configured along only one longitudinal edge in a manner allowing the foot to be mated with said base with either an inward or an outward orientation, each foot being removably attached to said bottom wall of said base adjacent to and substantially parallel to a corresponding one of said opposite edges with either said inward or said outward orientation, each foot being sufficiently wide to extend beyond the corresponding one of said opposite edges when oriented outwardly and being sufficiently narrow to avoid interfering with the other foot when oriented inwardly.

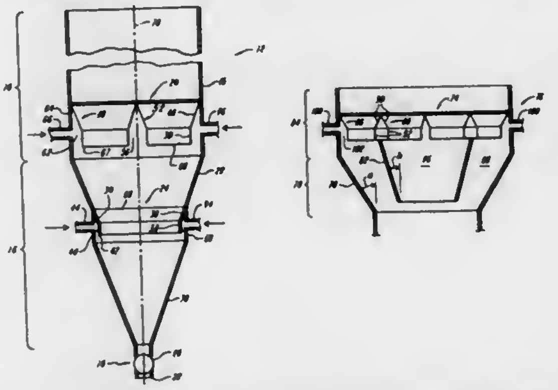
5,462,351
CONDITIONING VESSEL FOR BULK SOLIDS

T. Anthony Royal, North Andover, Mass., assignor to Jenike & Johanson, Inc., Westford, Mass.

Filed Jun. 20, 1994, Ser. No. 262,681

Int. Cl.⁶ B01F *13/02*

U.S. Cl. 366—101 **7 Claims**



1. A conditioning vessel for bulk solids comprising, in combination,

a bin comprising an annular first wall of generally constant cross section in the vertical dimension and an annular second wall joined to the lower end of the first wall and sloping downwardly and inwardly toward a discharge end, said bin being adapted to satisfy the conditions for mass flow of the solids,

a gas distributor comprising at least one elongate crossbeam extending on a chord within the interior of said first wall and comprising horizontally extending elongate sloping portions and elongate vertical portions joined to the lower ends of the sloping portions, said sloping and vertical portions forming a plenum space open to the interior of the bin at the lower ends of said vertical portions, and

means to connect said plenum space to a source of gas under pressure.

5,462,352
APPARATUS AND METHOD FOR HOMOGENEOUS MIXING OF FLUID COMPONENTS TO FORM A MIXED PRODUCT HAVING A MORE ACCURATELY SET MIXTURE RATIO

Manfred Mette, Ringstrasse 19a, 2000 Hamburg 73, Germany

PCT No. PCT/EP92/01082, § 371 Date Nov. 16, 1993, § 102(e) Date Nov. 16, 1993, PCT Pub. No. WO92/20439, PCT Pub. Date Nov. 26, 1992

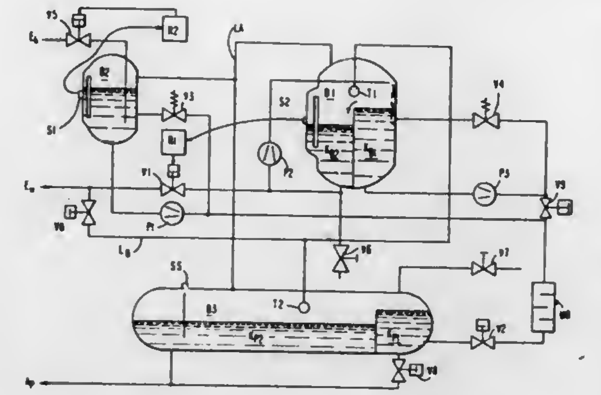
PCT Filed May 16, 1992, Ser. No. 142,312

Claims priority, application Germany, May 16, 1991, 41 16 031.2; Sep. 10, 1991, 41 30 413.6; Dec. 17, 1991, 9115831 U

Int. Cl.⁶ B01F *15/02;15/04*

U.S. Cl. 366—131 **26 Claims**

1. Process for mixing fluid components including a liquid component to form a mixed product having an actual mixture ratio as



close as possible to a predetermined adjustable mixture ratio of said fluid components, said process comprising the steps of:

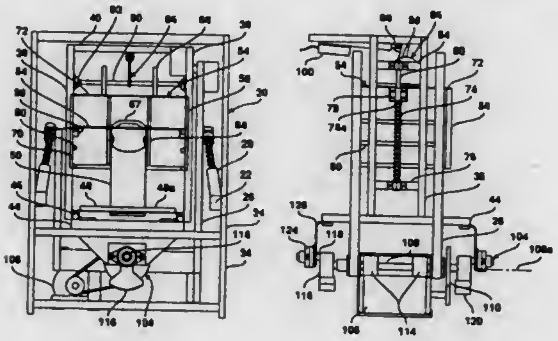
a) feeding said liquid component to a feed tank having an overflow weir dividing said feed tank into a first chamber and a second chamber;

b) circulating said liquid component from said second chamber to said first chamber to maintain a constant level of said liquid component in said second chamber and controlling a rate of said circulating of said liquid component by pumping means so that said liquid component in said second chamber overflows said overflow weir and so as to maintain a constant level of said liquid component in said first chamber at a fixed distance below that of said liquid component in said second chamber; and

c) pumping said liquid component from said second chamber and pumping another of said fluid components to a mixing means at a controlled rate to form said mixed product and feeding said mixed product to a collection tank for collecting said mixed product so that said actual mixture ratio is within 0.25% of said predetermined mixture ratio.

5,462,353
SHAKER WITH CAM OPERATED CLAMP

Noel A. Gatlin, Clifton, Ill., assignor to United Coatings, Inc., Kankakee, Ill.
Filed Mar. 10, 1994, Ser. No. 209,145
Int. Cl.⁶ B01F *11/00*
U.S. Cl. 366—209 **11 Claims**



1. An apparatus for shaking at least one paint container containing paint, the apparatus comprising:

a first frame;

a support means pivotally connected to an end of said first frame;

a shelf connected to said first frame and having an upper surface configured to support the at least one paint container in a generally upright position;

clamping means connected to said first frame for selectively clamping the at least one paint container to said shelf, said clamping means including,

a clamping member movable to contact the at least one paint container and clamp the at least one paint container on said shelf, said clamping member having a cage assembly slidably connected to said first frame, said cage assembly including a plurality of guide sets, said clamping member also including a lid configured to selectively slidably engage one of said guide sets to selectively position said lid relative to said cage assembly,

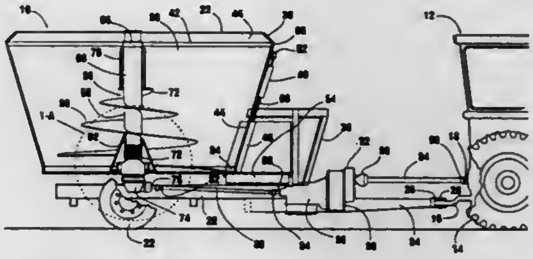
a cam operably contacting said clamping member, and

means for selectively rotating said cam to move said clamping member toward the at least one paint container; and

means for agitating said first frame to mix the paint within the at least one paint container, said agitating means including a means for rotating an opposite end of said first frame about an axis, said opposite end rotating means being attached to said support means.

5,462,354
LIVESTOCK FEED MIXER

Benjamin R. Neier, Dodge City, Kans., assignor to Roto-Mix Enterprises, Ltd., Dodge City, Kans.
Filed Jun. 9, 1994, Ser. No. 257,642
Int. Cl.⁶ B01F *7/24*
U.S. Cl. 366—314 **18 Claims**



1. Apparatus for mixing ingredients comprising:

a power source having a rotational power take-off;

a mixer housing forming a mixing chamber for holding said ingredients;

at least one rotatable mixing member mounted within said mixing chamber for rotation about a mixing axis to cause mixing of said ingredients within said mixer housing;

a variable power transfer device connected between said power take-off and said rotatable mixing member for transferring power from said power source to said rotatable mixing member for rotating said mixing member;

said power transfer device being capable of automatically reducing or increasing the rotational speed of said mixing member in response to an increase or decrease, respectively in the power load said mixing member places on said power source.

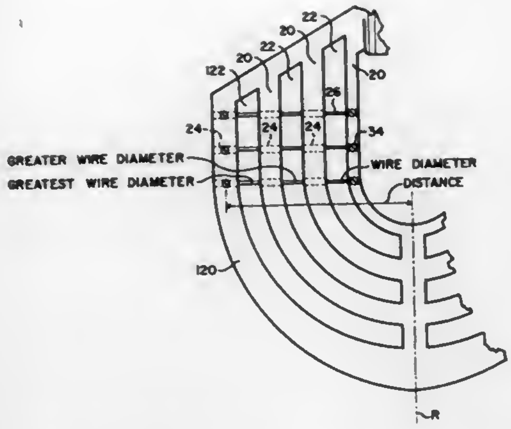
5,462,355
MIXING-CUTTING PADDLE

Donald H. Yowell, 1520 Lindberg Rd., Bethlehem, Pa. 18017
Continuation-in-part of Ser. No. 208,737, Mar. 10, 1994, Pat. No. 5,354,129, which is a continuation-in-part of Ser. No. 105,118, Aug. 12, 1993, abandoned. This application Oct. 7, 1994, Ser. No. 319,883
Int. Cl.⁶ B01F *7/18*
U.S. Cl. 366—343 **3 Claims**

1. A mixing-cutting paddle comprising:

a hub at a first end of the paddle, the hub having a rotational axis;

a plurality of paddle arms including a fan-like array of longitudinally extending arms interconnected at the hub and extending therefrom the arms being side-by-side and spaced apart defining longitudinally extending slots therebetween, the arms converging and being interconnected at a second end of the



paddle opposite the first end, outermost ones of the arms being at opposite sides of the paddle;

a plurality of wire members strung transversely through apertures formed in the arms and extending transversely through the slots, each wire member including a diagonally extending portion as it extends through outermost ones of the slots adjacent the outermost arms;

means for securing opposite ends of each wire member in the outermost arms, whereby the combination of paddle arms and wire members extending through the slots, forms a plurality of multidirectional mixing and cutting components of the paddle for producing an essentially dry, homogeneous, powdery-type mixture;

wherein paddle cutting efficiency is increased in response to decreased wire diameter; and

wire diameter is decreased as the distance from the rotational axis is decreased.

5,462,356

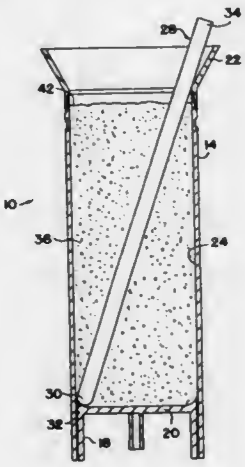
BONE AND DENTAL CEMENT METHOD AND PREFORM

William M. Murray, 2650 Spring Hill La., Enola, Pa. 17025

Filed Jun. 1, 1994, Ser. No. 252,266

Int. Cl.^{6} B01F *13/06;3/20*

U.S. Cl. 366—348 **40 Claims**



1. The method of making uniformly mixed bone or dental cement from dry cement powder and cement liquid, comprising the steps of:

A) forming a preform body from particles of dry cement powder with air between adjacent particles, the preform having a top, a bottom and a height;

B) pouring cement liquid onto the top of the preform body;

C) flowing the cement liquid into the preform body without physical mixing to distribute the cement liquid substantially uniformly along the height of the preform body;

D) flowing air displaced by cement liquid out of the preform body; and then

E) physically mixing together the cement powder in the preform body and the cement liquid in the preform body to form a flowable cement with cement liquid substantially uniformly distributed throughout the cement.

5,462,357

PROCESS FOR MULTISPECTRAL/MULTILOOK ATMOSPHERIC ESTIMATION

Paul M. Ingram, Jr., Mesquite; James R. Johnson, Plano, and Fenton L. Givens, Dallas, all of Tex., assignors to E-Systems, Inc., Dallas, Tex.

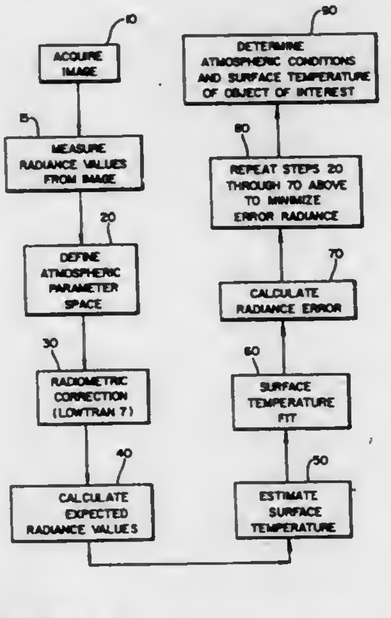
Continuation of Ser. No. 988,791, Dec. 10, 1992. This application Oct. 28, 1993, Ser. No. 141,948

The portion of the term of this patent subsequent to Jun. 28, 2011, has been disclaimed.

Int. Cl.^{6} G01J *5/02;* **G01W** *1/10*

U.S. Cl. 374—124 **19 Claims**

1. A method of estimating atmospheric conditions of an object,


10
ACQUIRE IMAGE
15
MEASURE RADIANCE VALUES FROM IMAGE
20
DEFINE ATMOSPHERIC PARAMETER SPACE
30
RADIOMETRIC CORRECTION (LOWTRAN 7)
40
CALCULATE EXPECTED RADIANCE VALUES
90
DETERMINE ATMOSPHERIC CONDITIONS AND SURFACE TEMPERATURE OF OBJECT OF INTEREST
80
REPEAT STEPS 20 THROUGH 70 ABOVE TO MINIMIZE ERROR RADIANCE
70
CALCULATE RADIANCE ERROR
60
SURFACE TEMPERATURE FIT
50
ESTIMATE SURFACE TEMPERATURE

comprising the steps of:

(a) measuring radiance values from an atmospheric image of the object;

(b) determining a set of atmospheric condition parameters associated with the atmospheric image;

(c) determining expected radiance values for the set of atmospheric condition parameters;

(d) determining the difference between the measured radiance values and the expected radiance values;

(e) adjusting the set of atmospheric condition parameters; and

(f) determining the atmospheric conditions of the object from the difference between the measured radiance values and the expected radiance values.

5,462,358

SELECTIVELY EXTRACTING INFRARED RADIATION FROM BIOLER INTERIOR TO DETERMINE THE TEMPERATURE OF INDIVIDUAL BOILER TUBES

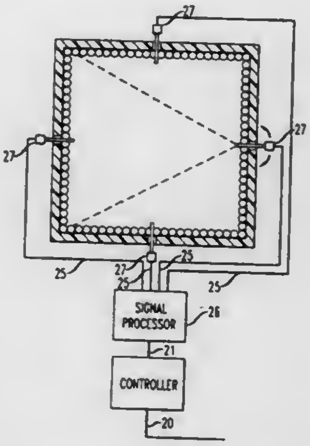
Walter V. Werner, Sparta, N.J., assignor to AT&T IPM Corp., Coral Gables, Fla.

Filed Jan. 3, 1994, Ser. No. 176,757

Int. Cl.^{6} G01J *5/08;* **G01K** *1/14;* **F22B** *37/42*

U.S. Cl. 374—124 **4 Claims**

1. For a power boiler comprising side-by-side arrays of boiler tubes disposed essentially flatly and vertically along rectangularly configured interior walls of a firebox flue, apparatus for receiving infrared radiation from inwardly-facing surfaces of said boiler tubes, the apparatus comprising:



a plurality of hollow-core waveguide infrared radiation-receiving probes mounted at fixed locations in said flue interior walls, each of said probes being rigid at flue gas temperatures and having a narrow-angle radiation acceptance cone;

fixedly mounted scanning means for directing the input end of each of said probes to point to inwardly-facing surfaces of boiler tubes that are disposed along an interior wall other than the wall through which said probe is mounted;

a remotely located signal processor; and

means for extracting infrared energy from the output end of each of said probes and directing said energy to said signal processor, wherein:

the scanning means are adapted to step each probe to a plurality of predetermined stop positions;

the acceptance cone of each respective probe intercepts, at each stop position, at least two boiler tubes;

for each respective probe, the acceptance cone at each stop position overlaps the acceptance cone at adjacent stop positions;

for each respective probe, the total number of boiler tubes intercepted at all stop positions is less than or equal to the number of stop positions; and

the signal processor comprises means for processing plural energy values, each said value representing energy collected from at least two boiler tubes, thereby to extract temperature values that are specific to individual boiler tubes.

5,462,359

TEMPERATURE PROBE

Asta Reichl, Stuttgart; Martin Jenner, Ludwigsburg; Armin Witzig, Renningen; Anita Rose, Hemmingen, and Bernd Kuenzl, Schwieberdingen, all of, Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

PCT No. PCT/DE93/01002, § 371 Date Jun. 30, 1994, § 102(e) Date Jun. 30, 1994, PCT Pub. No. WO94/10547, PCT Pub. Date May 11, 1994

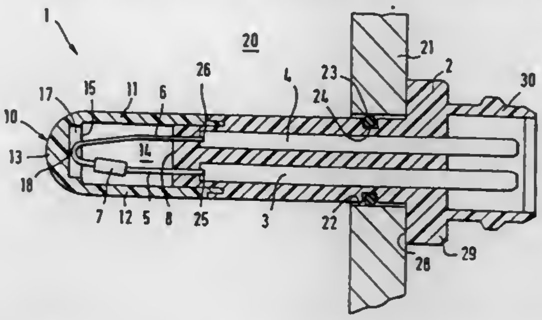
PCT Filed Oct. 21, 1993, Ser. No. 256,197

Claims priority, application Germany, Nov. 4, 1992, 42 37 224.0

Int. Cl.^{6} G01K *1/00;7/00;* **H01L** *1/02*

U.S. Cl. 374—148 **20 Claims**

1. A temperature probe for measuring the temperature of a medium flowing in a flow line of an internal combustion engine, having:



a temperature-dependent, electrical resistance element (7), connected with two rigid connecting wires (5, 6);

and a carrier body (2) that holds the connecting wires, in which a protective bracket (10), which encloses a flow window (14), is connected to the carrier body (2);

and the resistance element (7) is disposed in the flow window (14) that projects into the flow line (20), and at least one of the connecting wires (5, 6) exhibits a curved bend point (18, 18'), which projects into at least one retaining opening (17, 17') formed in at least one wall of the protective bracket (10).

5,462,360

STABILIZING WEDGE ZIPPER WITH HIGH MELT INDEX INTERLAYER

Paul A. Tilman, New City; Richmond M. Scott, Pleasantville, and Zdenek Machacek, Nanuet, all of N.Y., assignors to Minigrip, Inc., Orangeburg, N.Y.

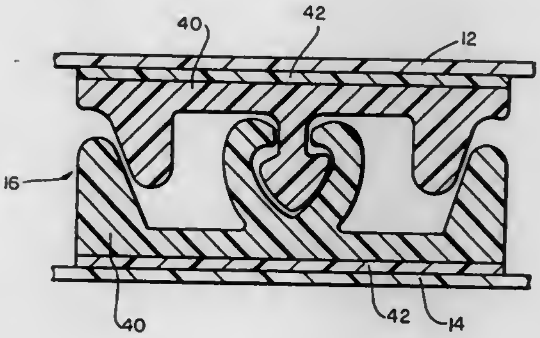
Continuation-in-part of Ser. No. 174,273, Dec. 28, 1993, Pat. No. 5,368,394. This application May 25, 1994, Ser. No. 249,144

The portion of the term of this patent subsequent to Nov. 29, 2011, has been disclaimed.

Int. Cl.^{6} B65D *33/24*

U.S. Cl. 383—63 **6 Claims**

1. A reclosable bag comprising:



- a first wall and a second wall joined to form an enclosure with a mouth defined by wall edges;
- a zipper for selectively opening and sealing said mouth, said zipper comprising a male profile strip extending along an internal surface of said first wall and a female profile strip adapted to interengage with said male profile and extending along an internal surface of said second wall,
- said male profile strip includes a first stabilizer wedge on one side thereof and parallel thereto, and a second stabilizer wedge on the other side thereof and parallel thereto across said bag,
- said female profile strip includes a first stabilizer wedge on one side thereof and parallel thereto, and a second stabilizer wedge on the other side thereof and parallel thereto across said bag, said first and second stabilizer wedges of said male profile being inward of said first and second stabilizer wedges of said female profile with respect to said male and female profiles, when said male and female profiles are aligned to be interengaged, and
- an interlayer disposed between at least a portion of one of said profile strips and its associated wall, said interlayer being formed at least in part of a strip of material extending parallel to said profiles which forms an adhesive bond with said wall at a lower temperature than a melt temperature of said at least one profile strip.

5,462,361

ELECTRORHEOLOGICAL FLUID DAMPER FOR A SLIDE MECHANISM

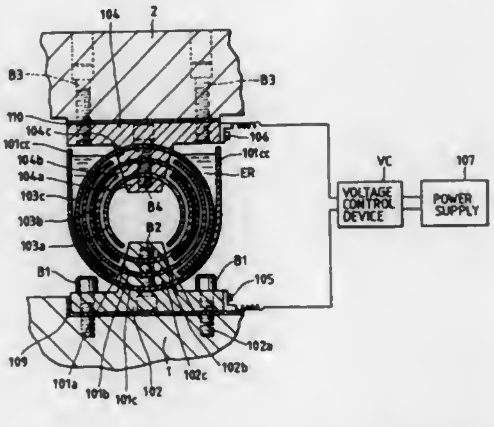
Chuichi Sato; Shigemi Tsukamoto, both of Kanagawa, and Hidenori Shinno, Tokyo, all of, Japan, assignors to NSK Ltd., Tokyo, Japan

Filed Sep. 14, 1994, Ser. No. 305,892

Claims priority, application Japan, Sep. 14, 1993, 5-252590

Int. Cl.^{6} F16C *29/02*

U.S. Cl. 384—9 **5 Claims**



1. An electrorheological fluid damper for a slide mechanism adapted to move a first object relative to a second object, comprising:
   - a first electrode plate mounted on the first object;
   - a second electrode plate mounted on the second object;
   - electrorheological fluid filled in a space defined by the first electrode plate and the second electrode plate; and
   - a voltage control device for variably controlling voltage applied to the electrorheological fluid across the first electrode plate and the second electrode plate.

5,462,362

WEAR RESISTING SLIDE MEMBER

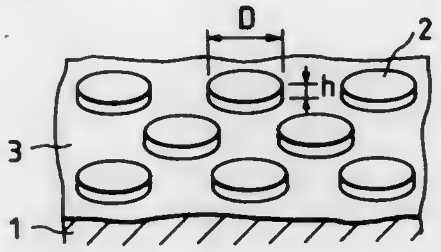
Toshio Yuhta; Ikuya Nishimura; Daijiro Kano, all of Hokkaido; Tsuyoshi Saitou, Kanagawa; Tomita Suzuki, Kanagawa, and Mamoru Tanaka, Kanagawa, all of, Japan, assignors to NSK Ltd., Tokyo, Japan

Filed May 2, 1994, Ser. No. 236,082

Claims priority, application Japan, Apr. 30, 1993, 5-127835

Int. Cl.^{6} F16C *17/00*

U.S. Cl. 384—13 **10 Claims**



1. A wear resisting slide member contacting with a mating member, comprising:
   - a mother member including a recessed and projected pattern formed in a slide surface contacting with said mating member, said recessed and projected pattern including a recessed portion and filled with a lubricant selected from a solid lubricant, a liquid lubricant and combination thereof, wherein said recessed portion holds an area within a range of 30 to 70% with respect to the whole of said slide surface, and includes the depth of 10 μm or less.

5,462,363

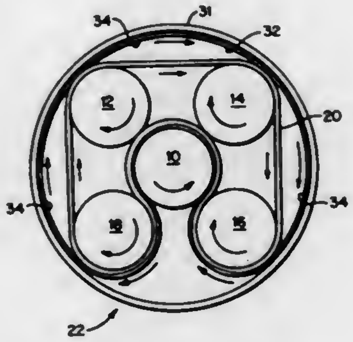
SCROLLER ROLLER BAND DEVICE

Erik J. Brinkman, c/o Andrew Ross, No. 9-626 Esquimalt Rd., Victoria, B.C., Canada

Filed Jul. 21, 1994, Ser. No. 278,145

Int. Cl.^{6} F16C *32/00;43/00*

U.S. Cl. 384—91 **23 Claims**



1. A rotary roller band device comprising:
   - a central rotating element and a plurality of orbiting rotating elements concentrically arranged around said central rotating element;
   - a row of bands each intertwined between said rotating elements, each band held in a C-shaped loop disposed partially around each of said rotating elements, said band being flexible and held taut by said rotating elements, and said band holding said elements in parallel,
   - wherein said orbiting elements rotate counter to said central rotating element, and said elements roll within said bands which move in endless loops.

20. A method for creating low friction rotational motion with a rotary device having a central element, orbiting elements and roller bands, comprising the steps of:
   - (a) positioning a plurality of orbiting rotating elements concentrically around a central element;

(b) weaving a row of roller bands between the rotating elements,
(c) holding each band in a C-shaped loop disposed partially around each of the rotating elements wherein each loop is offset with respect to another loop, and wherein the bands are flexible and provide stable support to the rotating elements;
(d) holding the orbiting elements parallel to the central element with the bands, and
(e) rotating the orbiting elements counter to the rotation of the central element and rotating the elements with the bands that move in endless loops.

5,462,364

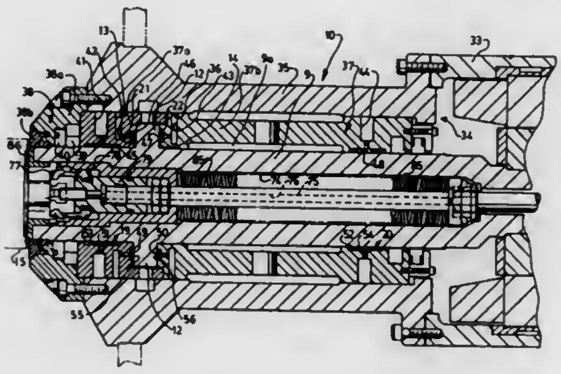
VARIABLE SPEED FLUID BEARING AND METHOD OF USE

Kugalur S. Chandrasekaran, Rockford, Ill.; Daniel M. Mills, Riverview, and Richard Ogletree, Southfield, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Apr. 2, 1993, Ser. No. 42,201

Int. Cl.^{6} F16C *32/06*

U.S. Cl. 384—111 **4 Claims**



1. A method of using hybridized, hydrodynamic/hydrostatic fluid bearings for supporting a rotary-driven spindle carrying annular bearing surfaces, comprising:
(a) providing and assembling at least two bearings about said spindle carrying a cutting tool at one end, each bearing comprising a bearing race having an annular surface facing a complementary annular surface on said spindle to define a continuous annular crevice space therebetween, each of said races having its race surface interrupted by a plurality of circumferentially spaced pressure generating zones each capable of compressing a fluid body contained within said zone into said crevice in either direction of rotation of said spindle, the zones of one of said races having their width extending axially while the zones of the other races having their width extending circumferentially, each zone of said races being comprised of a pocket having a recessed sill bisecting said pocket and a pair of pressure generating surfaces extending in opposite directions from said sill, each pressure generating surface being the mirror image of the other;
(b) driving said spindle at rotary speeds that vary between zero and 40,000 rpm; and
(c) supplying pressurized fluid to all of said sills for flow through said crevices with a preselected viscosity and a preselected pressure level correlated with the speed of said spindle, said pressurized supply being regulated to a first hydrostatic level when said spindle is driven at rotary speeds of up to 2000 rpm, and at hydrostatic level lower than said first hydrostatic level when said spindle is driven at rotary speeds in excess of 2000 rpm.

5,462,365

COMPOSITE RADIAL-AXIAL PLAIN BEARING

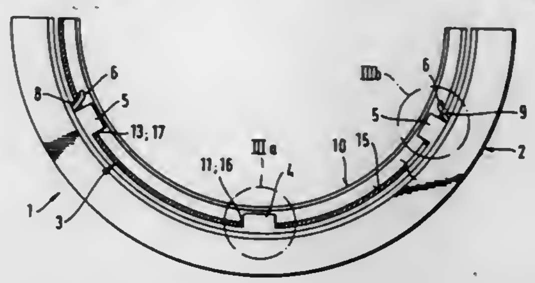
Horst Brandt, Weiterstadt, Germany, assignor to Glyco-Metall-Werke Glyco B.V. & Co. KG, Wiesbaden, Germany
PCT No. PCT/DE93/00161, § 371 Date Oct. 24, 1994, § 102(e) Date Oct. 24, 1994, PCT Pub. No. WO93/17250, PCT Pub. Date Sep. 2, 1993

PCT Filed Feb. 18, 1993, Ser. No. 290,797

Claims priority, application Germany, Feb. 19, 1992, 42 04 988.1; Feb. 10, 1993, 43 03 855.7

Int. Cl.^{6} F16C *9/02;17/10*

U.S. Cl. 384—294 **18 Claims**



1. Composite plain thrust journal bearing having a journal bearing part in the form of a half-liner or bush on one or both sides of which is mounted a thrust bearing part in the form of a ring part or a set of thrust bearing parts, every thrust bearing part having at its inner peripheral edge at least two retaining lugs, each of which engages into a recess provided in the region of the arcuate or circular rim of the journal bearing part, at least one retaining lug being flanked, as an attachment lug, with at least one splay finger, which engages in an undercut made in the associated attachment recess of the journal bearing part, such that the retaining lugs project radially inwards at mutually opposite angular distances and such that the undercut is delimited in the axial direction of the journal bearing part by a hook-shaped projection.

5,462,366

CRANKSHAFT BEARING

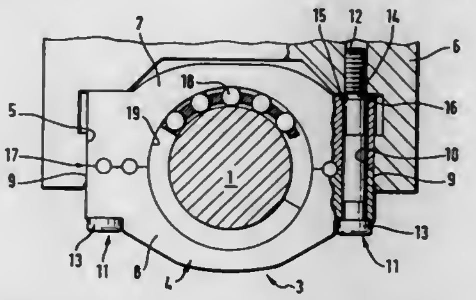
Oskar Häusler, Aurachtal, Germany, assignor to Ina Walzlager Schaeffler KG, Germany

Filed Sep. 28, 1994, Ser. No. 314,238

Claims priority, application Germany, Jan. 2, 1993, 43 33 658.2

Int. Cl.^{6} F16C *9/02;* **F02F** *7/00*

U.S. Cl. 384—457 **5 Claims**



1. A rolling bearing for mounting a crankshaft (1) in a crankcase (6) of an internal combustion engine comprising a bearing housing (4), between which housing (4) and a journal of the crankshaft (1), rolling elements (18) roll on raceways (19), the bearing housing (4) being split radially into two semi-shells (7,8) which can be connected to each other by screws (11), characterized in that a radially outer rolling element raceway (19) is formed directly on the semi-shells (7,8) and an outer peripheral surface of the semi-shells (7,8) comprises at least one fitting surface (9) extending parallel to a longitudinal central plane of the screws (11), by which fitting surface (9) the semi-shells (7,8) are guided in a fork-shaped seat

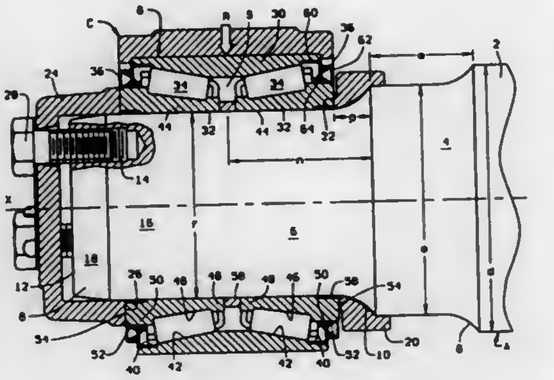
(5) formed in the crankcase (6), the semi-shells (7,8) being jointly held on the crankcase (6) by screws (11).

5,462,367
COMPACT BEARING AND STIFFENED JOURNAL

Rickie L. Davidson, Massillon, and Samuel R. Williams, Canton, both of Ohio, assignors to The Timken Company, Canton, Ohio

Filed Aug. 18, 1994, Ser. No. 292,939
Int. Cl.^{6} F16C *33/36*

U.S. Cl. 384—459 **16 Claims**



1. The combination comprising: an axle which revolves around an axis and has a journal which merges into a larger portion of the axle at a fillet; a backing ring fitted around the journal at the fillet and providing a first abutment surface that is located generally at the small end of the fillet where it is presented away from the fillet; an end member attached to the journal and providing a second abutment surface that is presented toward the first abutment surface; and a bearing located around the journal between the backing ring and the end member, the bearing including an outer race having raceways presented inwardly toward the axis, an inner race located within the outer race and around the journal, there being an interference fit between the inner race and the journal, the inner race having raceways presented outwardly toward the raceways of the outer race, such that an annular space exists between the races, and also having back faces that are against the abutment surface on the backing ring and end member, the inner race in the region of its back face that is against the end face of the backing ring being undercut so that the interference fit does not extend out to that back face and produce a stress concentration in the journal where the inner race and backing ring abut, rolling elements arranged in at least two rows between the raceways of the inner and outer races, and seals mounted on at least one of the races and cooperating with the other race to close the ends of the annular space between the races.

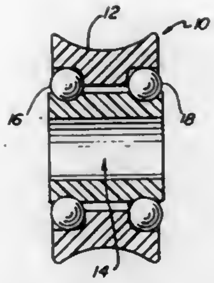
5,462,368
BALL BEARING BLOCK HAVING SELF-CONTAINED BEARINGS

Charles J. Lob, Oconomowoc, Wis., assignor to Harken, Inc., Pewaukee, Wis.

Filed Aug. 29, 1994, Ser. No. 297,485
Int. Cl.^{6} F16C *13/00;33/58*

U.S. Cl. 384—512 **9 Claims**

1. A bearing block comprising a central hub having ends, a pair of circular grooves in said hub near respective ends of the hub, said circular grooves defining a pair of spaced inner bearing races around a central axis and beating retaining lips between said grooves and respective ends, a sheave disposed around said hub, said sheave being generally ring shaped and having annular sides and an inner diameter, a pair of ring-shaped annular recesses in the sides of said sheave, said recesses being open to the sides and the inner diameter of the sheave and defining a pair of circular outer bearing races concentric with respective inner races, a plurality of ball bearings in bearing engagement between said inner an outer races, said ball bearings having a given diameter, and a pair of annular gaps defined between mid bearing retaining lips and outer races, with the distance between said lips and outer races being slightly less than the diameter of said ball bearings, said ball bearings being inserted through said annular gaps into said bearing engagement.

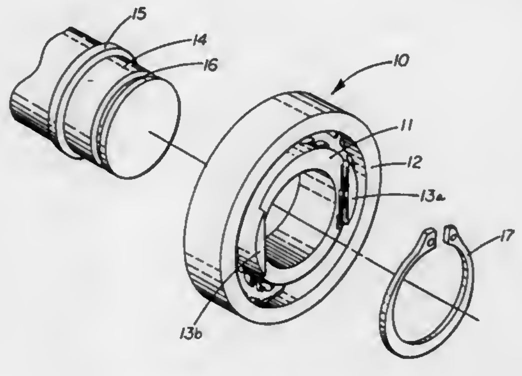


5,462,369
BEARING LOCK SYSTEM

James L. Layne, Scottsville, and Mark T. Johnson, Glasgow, both of Ky., assignors to Span Tech Corporation, Glasgow, Ky.

Filed Nov. 9, 1994, Ser. No. 336,598
Int. Cl.^{6} F16C *43/00;* F16B *21/18*

U.S. Cl. 384—538 **7 Claims**



1. A locking mechanism for an annular component to a shaft comprising:

means for locating said component along the longitudinal axis of said shaft;

an annular groove formed in the peripheral surface of said shaft on the opposite side of said component;

a recess extending diametrically across said component aligned with said groove;

at least one raised stop formed by a lateral face of said recess on said annular component;

an eccentric ring seated in said groove and positioned substantially in the plane of said recess;

said ring being split to form an opening to allow installation and removal from said groove;

said ring also having an enlarged portion to engage and cam against said face upon initial relative rotation between said component and said shaft;

whereby said component is locked against rotation relative to said shaft by pressing of said ring tightly into said groove.

5,462,370

TILTABLE SUPPORTING ROLLER BEARING

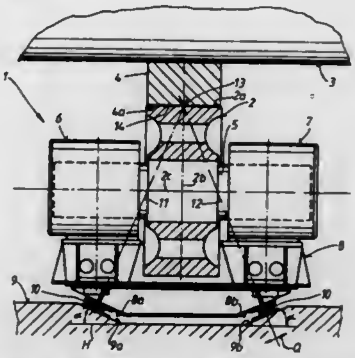
Gerhard Kastingschafer, Wadersloh; Johannes Auf dem Venne, Ennigerloh; Herbert Pingel, Wadersloh; Reinhard Giesemann, Harsewinkel; Bernhard Peterwerth, Bad Laer; Klaus Gerhardt, Munster, and Reinhold Gebbe, Sassenberg, all of, Germany, assignors to Krupp Polysius AG, Beckum, Germany

Filed May 26, 1994, Ser. No. 249,750

Claims priority, application Germany, Jul. 19, 1993, 43 24 187.5

Int. Cl.^{6} F16C *19/50*

U.S. Cl. 384—549 **10 Claims**



1. Tiltable supporting roller bearing for supporting a rotary drum (3) which is driven in rotation, comprising

a) supporting roller (2) which is supported with its roller axle (5) so as to be freely rotatable in two pivot bearings (6, 7 and has a circumferential running surface (4*a*) of the rotary drum (3) mounted on its outer circumferential surface (2*a*),

b) a bearing structure (8) on which the pivot bearings (6, 7) are arranged and which is tiltably supported by way of bearing elements (10) on a stationary foundation plate (9),

characterised in that

c) the bearing elements are constructed as resilient support bearings (10) which are easily shifted in their cross direction, and in each case in the region below the two pivot bearings (6, 7) these support bearings are inclined towards one another between the bearing structure (8) and the foundation plate (9) in such a way that central axes (11, 12) passing vertically through it intersect in the region of the point of intersection (13) between the vertical central axis (2*b*) of the supporting roller and the line of contact (14) between the outer circumferential surface (2*a*) of the supporting roller and the circumferential running surface (4*a*) of the rotary kiln.

5,462,371

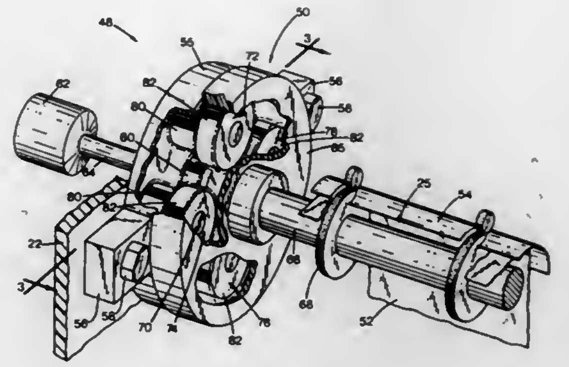
INDEXING PLANETARY GEAR TRAIN FOR A PRINTER

Robert K. Beretta, and Jason M. Quintana, both of Vancouver, Wash., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jun. 21, 1994, Ser. No. 263,848

Int. Cl.^{6} B41J *17/02*

U.S. Cl. 400—569 **17 Claims**



1. A print media feed system for use in a printing mechanism having a chassis and print zone, the feed system comprising:

a media advance mechanism that propels print media through the print zone;

drive motor; and

an indexing planetary gear assembly that couples the drive motor to the media advance mechanism, the assembly comprising plural components including:

a primary ring supported by the chassis;

a secondary ring coupled to drive the media advance mechanism;

a sun gear driven by the drive motor; and

four planet gear sets, each planet gear set having stacked primary and secondary planet gears, the primary planet gear engaging the primary ring, and the secondary planet gear engaging the secondary ring;

wherein for a selected line feed increment, at least two of the plural components of the planetary gear assembly are fully indexing for each line feed increment; and

wherein each planet gear set has an alignment indicia, and the four planet gear sets are oriented in first and second diametrically opposed pairs around the sun gear, with said first pair having alignment indicia oriented in a first direction and said second pair having alignment indicia oriented opposite to said first direction at the beginning of a first line feed increment, while at the end of the first line feed increment, the positions and orientations of the first and second pairs of planet gear sets are exchanged from those occupied at the beginning.

5,462,372

TAPE PRINTER AND METHOD

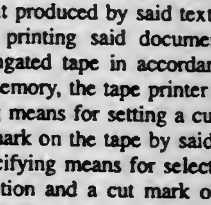
Kazuhisa Hirono, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Feb. 23, 1994, Ser. No. 200,695

Claims priority, application Japan, Mar. 15, 1993, 5-080206; Nov. 12, 1993, 5-283044

Int. Cl.^{6} B41J *11/66*

U.S. Cl. 400—615.2 **20 Claims**



1. A tape printer having text producing means for producing a text comprised of document data, a text memory for storing therein text data about a text produced by said text producing means and printing means for printing said document data in a printing direction on an elongated tape in accordance with the text data stored in said text memory, the tape printer comprising:

print mode setting means for setting a cut-mark print mode for printing a cut mark on the tape by said printing means; and

print position specifying means for selectively specifying a cut mark print position and a cut mark orientation on the tape when said cut-mark print mode is set by said print mode setting means, wherein said cut mark orientation is one of approximately parallel and approximately perpendicular to said printing direction of said document data, and wherein said print mark position can be set freely relative to a position of said document data.,

said printing means for printing the cut mark at the position and in the orientation specified by said print position specifying means when the document data is printed on the tape in said cut-mark print mode, wherein said cut mark is extendible beyond the width of said document data if said cut mark orientation is parallel to said printing direction and said cut mark is extendible beyond the height of said document data if said cut mark orientation is perpendicular to said printing direction.

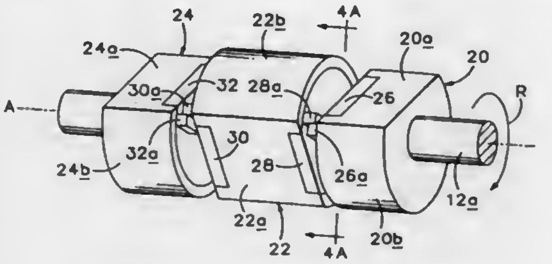
5,462,373
SHEET ADVANCEMENT SYSTEM WITH PHASE-ADJUSTABLE ROLLER ARRANGEMENT

Keng S. Chia, Singapore, Singapore, assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed May 3, 1994, Ser. No. 237,520

Int. Cl.⁶ B41J *11/58*

U.S. Cl. 400—62.4 **18 Claims**



1. A sheet media advancement system for use in passing a sheet along a sheet media path, the sheet advancement system including a roller arrangement which comprises:

- a first roller mounted for rotation about an axis which extends across the sheet media path, said first roller defining a periphery with gripping and non-gripping surface regions, and two end surfaces;
- a second roller mounted for rotation about the axis which extends across the sheet media path, said second roller defining a periphery with gripping and non-gripping surface regions, and two end surfaces, an end surface of said first roller facing an end surface of said second roller; and
- a roller coupling consisting of contact surfaces projecting from each of said facing end surfaces, said contact surfaces being movable between engaged positions and disengaged positions to selectively place said rollers in an in-phase relative rotational orientation wherein said non-gripping surface regions of said first and second rollers face the sheet media path to afford passage of a sheet thereby, or an out-of-phase relative rotational orientation wherein said rollers are fixed relative to one another and rotate together with said gripping surface region of said first roller arcuately overlapping said non-gripping surface region of said second roller substantially throughout 360-degrees of rotation to provide for substantially continuous gripping surface region engagement of the sheet substantially throughout a sheet feed cycle wherein the sheet is passed entirely from the roller arrangement.

5,462,374
CARD PRINTING APPARATUS

Nobuo Kohno, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

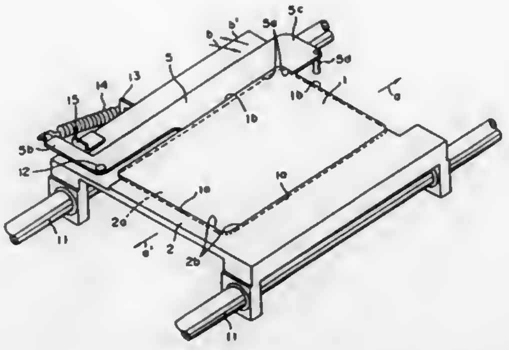
Continuation of Ser. No. 19,638, Feb. 18, 1993, abandoned. This application Sep. 13, 1994, Ser. No. 304,818

Claims priority, application Japan, Feb. 25, 1992, 4-073186

Int. Cl.⁶ B41J *11/58*

U.S. Cl. 400—625 **25 Claims**

1. A card printing apparatus for printing a graphic design on the surface of a card, comprising:



- a card stage adapted to mount a card on the upper surface of the card stage;
- feeding means for feeding said card stage along a straight linear path being parallel to the upper surface thereof;
- card stock means for stocking a plurality of cards;
- means responsive to the feeding of said card stage for withdrawing one card at a time from said card stock means so that a card is mounted onto said card stage;
- printing means for printing the graphic design on the surface of the card mounted on said card stage; and
- ejector means responsive to the feeding of said card stage for ejecting the card mounted on said card stage to a card collection zone, wherein the upper surface of said card stage comprises a first plane surface operative to receive the card thereon and a second plane surface aligned parallel to said first plane surface and extending along at least two adjoining sides of said card, and spaced at a distance from said first plane surface which is substantially equal to a thickness of the card.

5,462,375
PRINTER AND DATA PROCESSING APPARATUS HAVING PRINTING UNIT

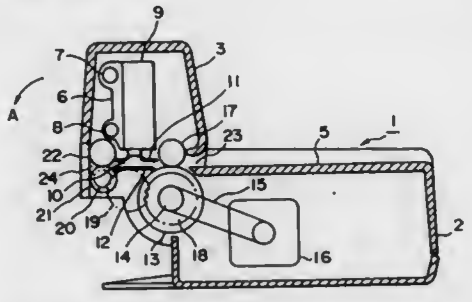
Minoru Isobe; Koutaro Yoshimura, and Shigemi Togashi, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Apr. 29, 1994, Ser. No. 236,916

Claims priority, application Japan, May 17, 1993, 5-114680

Int. Cl.⁶ B41J *29/02*

U.S. Cl. 400—680 **5 Claims**



1. A printer comprising:

- a printer body having a body housing with an upper surface for supporting a printable sheet in a substantially horizontal plane, a drive roller with a shaft and a surface, and a drive means for driving the drive roller, the body housing rotatably supporting the drive roller below the horizontal plane with the surface of the drive roller being substantially tangential to the horizontal plane; and
- a printing unit having a print head for printing on the sheet and a driven roller with a shaft substantially parallel to the shaft of the drive roller and a surface, the printing unit being rotatable with respect to the shaft of the drive roller; and
- a supporting means for rotatably supporting the printing unit in a printing position in which the printing unit and print head are substantially above the horizontal plane and in a non-printing

position in which the printing unit and print head are substantially below the horizontal plane,

the printing unit in the printing position forming with the upper surface of the body housing a sheet insertion slit for receiving the sheet into the printing unit from the upper surface, the printing unit further having a sheet discharge slit for discharging the sheet, the sheet insertion slit and the sheet discharge slit being substantial coincident with the horizontal plane, the printing unit in the printing position situating the driven roller substantially above the horizontal plane with the surface of the driven roller being substantially tangential to the horizontal plane and pressing against the drive roller.

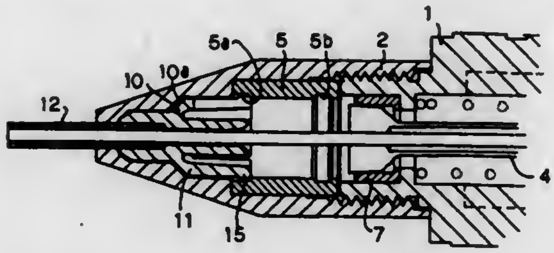
5,462,376
MECHANICAL PENCIL WITH IMPROVED SLIDER MECHANISM

Hidehei Kageyama; Shouji Anzai, and Yoshihide Mitsuya, Saitama, all of, Japan, assignors to Kotobuki & Co., Ltd., Kyoto, Japan

Filed Feb. 16, 1994, Ser. No. 197,477

Int. Cl.⁶ B43K *21/22;21/16*

U.S. Cl. 401—65 **5 Claims**



1. A mechanical pencil, comprising:

an outer tube;

a point member attached to said outer tube;

an axially slidable lead guide inserted in said point member;

a slider fixed to said lead guide for sliding said lead guide along an axis of said point member between a fully projected position for writing and a fully retracted position for storage;

said slider including

an inner tubular member for frictionally supporting a movable lead with a first frictional resistance allowing said lead to move within said lead guide,

a sliding member for contacting an internal peripheral surface of said point member with a second frictional resistance greater than said first frictional resistance, and

a locking projection provided on an external peripheral surface of said sliding member for securing said slider at one of only two predetermined positions within said point member; and

wherein an internal recessed peripheral engaging surface is provided on said internal peripheral surface of said point member for engaging the locking projection of said slider at either of said only two predetermined positions which correspond to said fully projected position and said fully retracted position of said lead guide.

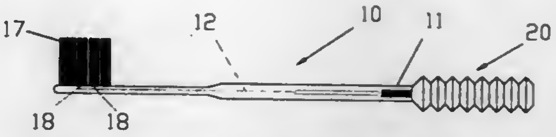
5,462,377
TOOTHBRUSH

Jose Martinez, Jr., 19302 Pine Glen Dr., and Michael P. Joyce, 17560 Braddock Rd., both of Fort Myers, Fla. 33912

Filed Jun. 14, 1994, Ser. No. 260,387

Int. Cl.⁶ A46B *11/02*

U.S. Cl. 401—185 **1 Claim**



1. A container loaded, pressure operated, toothpaste dispensing toothbrush comprising:

an elongated handle having an inward end and a terminal end and a smooth diameter bore extending therethrough, said bore having an inner end and a terminal end, said terminal end having internal threads, formed in said bore,

a brush head having a plurality of bristle tufts formed on said inward end of said handle, said brush head having toothpaste outlets communicating with said bore inner end for discharge of toothpaste to said bristle tufts, and

an extended, removable, flexible, toothpaste application pump having an accordion bellows shaped sidewall of flexible and compressible material collapsible with pressure, an external threaded portion and an extended tube portion, said extended tube portion fitting within said terminal end of said bore and said external thread portion mating with and sealingly engaged with said internal threads, whereby exerting pressure on said application pump collapses said sidewall, forces toothpaste through said bore, through said outlets, and thus into brushing contact with said bristle tufts.

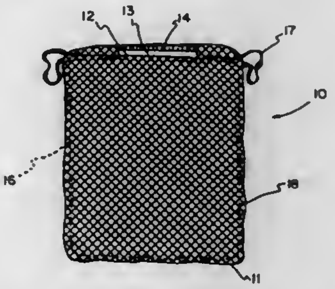
5,462,378
SOAPSOCK

William A. Webb, Avent Ferry Rd. P.O., Raleigh, N.C. 27606

Filed Mar. 30, 1994, Ser. No. 199,423

Int. Cl.⁶ A47K *5/05;7/03*

U.S. Cl. 401—201 **6 Claims**



1. A wash cloth adapted to receive a bar of soap, comprising:

a generally tubular shaped body of porous, elastic cloth stitched closed at one end, to form a longitudinal pocket therein, said pocket being open at the opposite end to form a mouth;

an elastic band disposed about the periphery of the mouth of said pocket, and being stitched to form a diameter smaller than the diameter of the tubular body when in contracted condition; and

a plurality of inwardly projecting retaining ridges mounted at regular intervals on the inner surface of said elastic band whereby said ridges are elastomerically biased against one end of a bar of soap after it is inserted in the longitudinal pocket.

5,462,379
APPLICATOR HAVING CAP WHICH PRESSURIZES AND SEALS INNER SPACE

Yasuhiro Masumoto, and Isao Shimada, both of Tokyo, Japan, assignors to Sailor Pen Co., Ltd., Tokyo, Japan

Filed May 27, 1994, Ser. No. 250,019

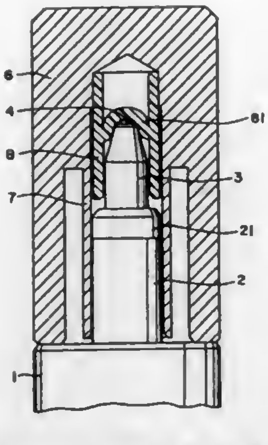
Claims priority, application Japan, Aug. 31, 1993, 5-051636 U; Jan. 22, 1993, 5-061553 U

Int. Cl.⁶ B43K *9/00;7/00*

U.S. Cl. 401—213 **6 Claims**

1. An applicator comprising:

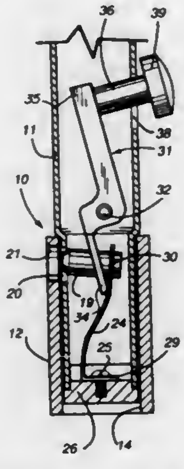
fluid tank means for containing a highly viscous film-forming fluid to be applied;



a neck formed contiguous with said fluid tank means and having an outer circumference;
a tip having a caulked front edge and held within said neck;
an application member retained in said tip such that said application member may be partly exposed from the front edge of said tip;
a spring for resiliently forcing said application member in abutting relation against the caulked front edge of said tip; and
a cap for covering said tip, said cap including:
 an inner barrel with an inner circumference in intimate contact with the outer circumference of said neck so as to seal said tip,
 a cylindrical valve member, and
 flexible diaphragm means in the cylindrical valve member for:
  pushing said application member against the force of said spring so as to retract said application member from the caulked front edge of said tip during initial engagement of said cap with said neck when said cap is applied in covering relation to said tip such that a pressurized space in said cylindrical valve member pressurizes said fluid tank, and
  sealing the caulked front edge of said tip when said cap is fully engaged with said neck.

5,462,380
DETENT

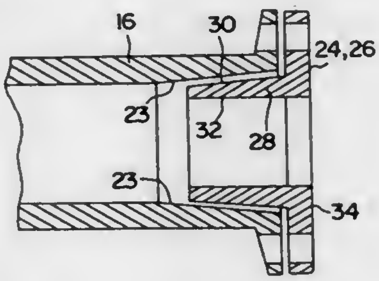
Gregory A. Peek; William B. Lytle, both of Highlands Ranch, and John A. Dyer, Evergreen, all of Colo., assignors to LaBac Systems, Inc., Highlands Ranch, Colo.
Filed Nov. 10, 1994, Ser. No. 337,324
Int. Cl.^{6} F16B *21/00*
U.S. Cl. 403—329 **1 Claim**



1. A detent for releasably securing an inner telescoping tube within an outer telescoping tube, comprising an inner tube and an outer tube said tubes having alignable openings in the walls thereof for receiving the detent, said detent comprising a detent pin adapted to extend through said tube wall openings for releasably latching said tubes together, a leaf spring secured at the inserted end of said inserted tube and extending within said tube into biasing engagement with said detent pin for biasing said pin into the latching position, a bell crank pivotally mounted within said inserted tube and having one crank end engaged with said biasing spring adjacent said biasing engagement of said leaf spring with said detent pin an actuating knob extending through the wall of said inserted tube into operative engagement with the opposite end of said bell crank whereby pushing on said actuating knob moves said spring and thereby said locking pin against the bias of said spring to withdraw said locking pin from the aperture in the outer tube thereby releasing said tubes for separation.

5,462,381
CORROSION RESISTANT BUSHING

Gary DeWachter, and John K. Newton, both of Greenville, S.C., assignors to Reliance Electric Industrial Company, Greenville, S.C.
Continuation of Ser. No. 104,987, Aug. 10, 1993, abandoned, which is a continuation of Ser. No. 890,367, May 26, 1992, abandoned, which is a continuation of Ser. No. 512,657, Apr. 20, 1990, abandoned. This application Nov. 16, 1994, Ser. No. 340,544
Int. Cl.^{6} F16B *2/00*
U.S. Cl. 403—365 **15 Claims**

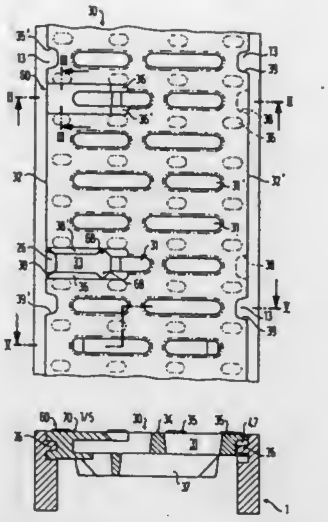


1. A metallic bushing for coupling a shaft to a gear box wherein said gear box comprises a hub, said bushing having a flange to allow mounting of said bushing to said hub, said bushing having a tapered outer surface, said bushing defining an interior bore therethrough for receiving said shaft, said interior bore and said tapered outer surface having a coating thereon, said coating comprising a fluorocarbon polymer composition and a thermoset binder material, said coating being of sufficient resiliency to prevent lock up of said bushing with said hub and to allow said bushing to transmit adequate torque to couple said shaft with said gear box without the employment of keys or spines when said shaft is received within said interior bore of said bushing.

5,462,382
SURFACE DRAINAGE APPARATUS

Heinrich Sauerwein, Nubbel, and Wolfgang Arm, Rendsburg, both of, Germany, assignors to ACO Severin Ahlmann GmbH & Co., KG, Rendsburg, Germany
Filed Dec. 3, 1993, Ser. No. 162,337
Claims priority, application Germany, Dec. 10, 1992, 42 41 705.8; Aug. 18, 1993, 43 27 810.8
Int. Cl.^{6} E01F *5/00*
U.S. Cl. 404—2 **17 Claims**

1. Surface drainage apparatus comprising
a channel body defining a drainage channel,
a cover for the drainage channel defining apertures through which drainage can pass into said drainage channel,



a fixing means for attachment of said cover to said channel body and comprising a first fixing element for attachment to said channel body and a complementary second fixing element for attachment to said cover,

said second fixing element comprising a bolt that is mounted in said cover so as to be capable of sliding into a locking position in the direction toward a long edge defined by said cover and back out of this locking position into an opened position, and

said first fixing element comprising a retaining means which when said bolt slides into said locking position engages with said bolt in such a way that said cover is retained on said channel body.

5,462,383

HOUSING DEVICE FOR FITTING IN THE PAVEMENT

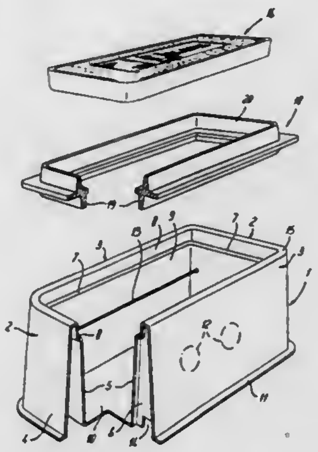
Pieter Van 'T Veer, The Hague, Netherlands, assignor to Zweva Holding B.V., Emst, Netherlands

Filed Jul. 27, 1994, Ser. No. 280,934

Claims priority, application European Pat. Off., Aug. 13, 1993, 93202370

Int. Cl.^{6} E01C *11/22;* **E01F** *5/00*

U.S. Cl. 404—4 **13 Claims**



1. In a housing device for fitting in pavement, the device opening out on the surface of the pavement, which device comprises sides forming an interior space and bounding an access opening near their top end, which sides each have an inside wall and an outside wall which are situated a horizontal distance apart; the improvement comprising vertical ribs interconnecting said inside wall with said outside wall.

5,462,384

SELF-CONTAINED DISPENSING BOLLARD OF VARIABLE HEIGHT

Yves Arlandis, Roblon, France, assignor to 5-These Industrie, Villeneuve-les-Avignon, France

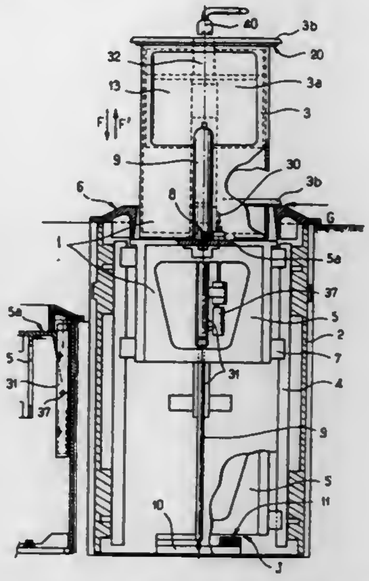
PCT No. PCT/FR93/00013, § 371 Date Sep. 23, 1994, § 102(e) Date Sep. 23, 1994, PCT Pub. No. WO93/14272, PCT Pub. Date Jul. 22, 1993

PCT Filed Jan. 8, 1993, Ser. No. 256,394

Claims priority, application France, Jan. 10, 1992, 92 00278

Int. Cl.^{6} E01F *13/00*

U.S. Cl. 404—6 **11 Claims**



1. A self-contained bollard device of variable height for dispensing commodities, the device comprising a vertically movable bollard inserted in a housing; an actuator which vertically moves said bollard; a ratchet mechanism using a holding system for holding the bollard in the raised and lowered positions; wherein the bollard contains a rotary shutter which covers a window in the bollard when the bollard is not in use to dispense commodities, or presents a dispensing surface which carries sockets for dispensing commodities when the bollard is in use to dispense commodities.

5,462,385

MANHOLE COVER TOOL

John S. Mohlengraft, Upland, Calif., assignor to GTE California Incorporated, Thousand Oaks, Calif.

Filed Dec. 19, 1990, Ser. No. 629,914

Int. Cl.^{6} E02D *29/14;* **B66F** *11/00;3/00*

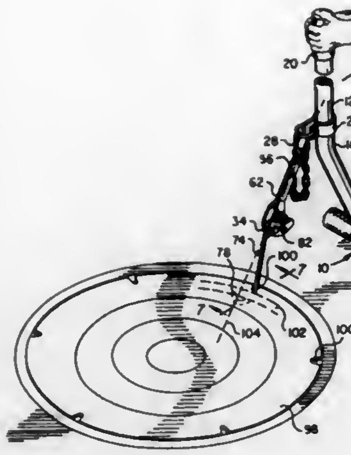
U.S. Cl. 404—25 **24 Claims**

1. A manhole cover tool for engaging a manhole cover residing in a first position and for allowing a person to safely reposition said manhole cover to a second position, said tool comprising:

a rigid handle extending from an anchoring end to a gripping end;

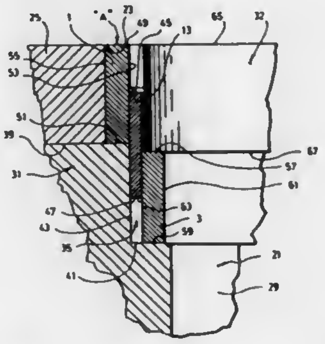
a hook-shaped member for engaging said manhole cover, said hook-shaped member having a first end and a second end which opposes said first end, and said hook-shaped member being configured to exhibit a first radius of curvature through an intermediate portion thereof and a second radius of curvature between said intermediate portion and said second end, said second radius of curvature being less than said first radius of curvature; and

means, coupled between said first end of said hook-shaped member and said handle at a location between said anchoring and gripping ends, for substantially restraining rotation of said hook-shaped member relative to said handle, said rotation being substantially restrained in each of two dimensions when said hook-shaped member engages said manhole cover.



5,462,386
WATERTIGHT RAISING BAND FOR MANHOLE

Alain Prescott, 102 De Gaulle, Lorraine, Quebec, Canada
Filed Sep. 2, 1994, Ser. No. 299,967
Int. Cl.^{6} E02D *29/14*
U.S. Cl. 404—26 **6 Claims**



1. A raising band for use in a manhole having a cover of a given height to raise said cover, the latter having an upper face and a lower face of a given surface, said manhole comprising a frame having an upper surface in which is defined a recess having a base parallel to the upper surface of the frame and a lateral face perpendicular to the said upper surface, said recess having a surface area slightly greater than that of the cover to receive and support the latter and a height approximately equal to that of the said cover, said raising band comprising:

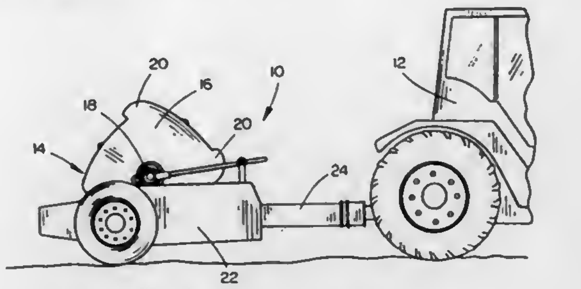
a lower ring having an upper wall, a lower wall and internal and external lateral walls, said lower ring being dimensioned so that its lower wall rests against the base of the recess;

an upper ring having an upper wall, a lower wall and internal and external lateral walls, said upper ring being dimensioned to rest against the upper surface of said frame, said upper ring being also larger than the lower ring and having a surface area approximately equal to and of the same shape as the surface of the cover; and

connecting means to join together the said upper and lower rings; wherein said connecting means consists of a rigid and waterproof sleeve co-axially joining said lower and upper rings, said sleeve having an upper extremity fixed in a continuous manner on the internal lateral wall of the upper ring and a lower extremity fixed on the external lateral wall of the lower ring, said double fixation being carried out at a height chosen in such manner that, one said sleeve is fixed to said upper and lower rings and the raising band is disposed in the recess provided in the manhole frame, that is when the lower wall of the upper ring rests on the upper surface of the frame and the lower wall of the lower ring rests on the base of said recess, the upper face of the cover is at the level of the upper wall of the upper ring.

5,462,387
CONCRETE BREAKING APPARATUS

Scott R. Roth, 848 Hidden Hills Dr., Bellevue, Nebr. 68005
Filed Oct. 24, 1994, Ser. No. 328,102
Int. Cl.^{6} E01C *23/00*
U.S. Cl. 404—90 **8 Claims**



1. A concrete breaking apparatus comprising:

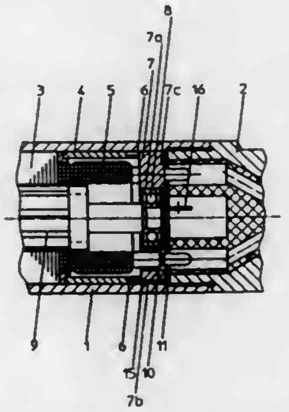
a non-circular multi-lobed impact roller connected via an axle to a frame so as to follow the frame when the frame is propelled;

each lobe of the roller including an impact surface with a dynamic impact region which intermittently contacts the ground as the roller rotates on the frame; and

a ridge projecting outwardly from the impact surface of each lobe and oriented along a line parallel to the axle and centrally within the dynamic impact region.

5,462,388
VIBRATOR WITH INCORPORATED ELECTRIC MOTOR

Manfred Polacek, Germering, Germany, assignor to Wacker-Werke GmbH & Co. KG, München, Germany
PCT No. PCT/EP93/01107, § 371 Date Mar. 14, 1993, § 102(e) Date Mar. 14, 1993, PCT Pub. No. WO93/23641, PCT Pub. Date Nov. 25, 1993
PCT Filed May 6, 1993, Ser. No. 182,064
Claims priority, application Germany, May 11, 1992, 42 15 463.4
Int. Cl.^{6} B01F *11/00*
U.S. Cl. 404—113 **3 Claims**



1. A vibrator for compacting construction materials comprising:

a housing having a housing mantle with a first end face, said housing mantle having a cylindrical interior;

said housing further comprising an upper part for closing said housing at said first end face of said housing mantle, said upper part axially inserted into said housing mantle and secured in a closing position thereof against displacement in an axial direction of said housing;

a support surface axially fixedly connected within said housing mantle and extending radially inwardly;
an unbalanced shaft;
an electric motor drivingly connected to said unbalanced shaft and positioned within said housing, said electric motor having an inner rotor and an outer cylindrical stator pack;
said electric motor inserted into said cylindrical interior of said housing mantle from said first end face;
said stator pack inserted into said cylindrical interior of said housing mantle with sliding fit and secured against rotation relative to said housing mantle;
said stator pack having a recess;
a spreading element made of spring steel for securing said stator pack, said spreading element inserted into said housing mantle through said first end face and positioned on said stator pack before closing said housing;
said spreading element clamped between said support surface and said upper part of said housing:
said spreading element having at least one axially extending projection for form-fittingly engaging said recess of said stator pack: and
said spreading element further having a plurality of spreading pawls resting on said support surface, said spreading pawls being distributed evenly spaced about an inner circumference of said housing mantle and being forced against said housing mantle when axially clamping said spreading element.

5,462,389

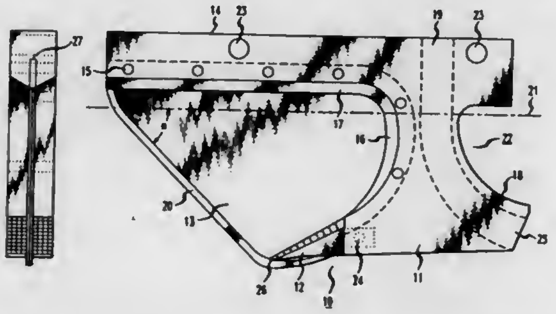
UNDERSEA CABLE BURIAL PLOWSHARE AND SLED APPARATUS

Frank D. Messina, New Providence, N.J., assignor to AT&T IPM Corp., Coral Gables, Fla.

Continuation of Ser. No. 35, Jan. 4, 1993, abandoned. This application Feb. 1, 1994, Ser. No. 189,855

Int. Cl.^{6} E02F *5/10*

U.S. Cl. 405—183 **4 Claims**



1. A self-burying plowshare having a normal towing direction to be referred to as the forward direction, the plowshare comprising:
a plowshare frame having respective top, right, and left sides, and further having a concave, forward-facing, open mouth portion which has a bottom end;
first and second plowtip blades affixed to respective right and left sides of the plowshare frame, adjacent the bottom end of the open mouth portion, each said blade having an apex;
a plowguard having a top edge, a rear edge, and a soil-contacting leading edge; and
means for mounting said plowguard on said frame such that said top and rear edges lie adjacent said frame within said open mouth portion, wherein:
a) each said plowtip blade comprises an upper surface which during normal towing conditions is oriented in relation to impinging soil forces so as to generate a downward force upon said plowshare;
b) the leading edge comprises a forward-facing portion which, during normal towing conditions extends downward and rearward from the soil ground plane at an acute angle with said plane;
c) the leading edge further comprises a foot portion which is continuous with the forward-facing portion, said foot portion and an adjacent part of the forward-facing portion together forming a convex surface; and
d) the convex surface partly surrounds a region between the apices of the plowtip blades, such that during normal towing conditions, hard obstructions met by the plowguard will tend to pass below the foot portion without impinging on the plowtip blades.

5,462,390

FOAMED GEL FOR BLOCKING FLUID FLOW IN SOIL

Robert D. Sydansk, Littleton, Colo., assignor to Marathon Oil Company, Findlay, Ohio

Continuation-in-part of Ser. No. 336,150, Nov. 8, 1994. This application Jan. 4, 1995, Ser. No. 368,522

Int. Cl.^{6} E02D *3/12*

U.S. Cl. 405—264 **17 Claims**

1. A process for blocking fluid flow in a soil comprising:
placing a foamed gel in a treatment region of a soil, wherein said foamed gel comprises a polyacrylamide or a partially hydrolyzed polyacrylamide, a crosslinking agent containing a trivalent chromium cation complexed with at least one organic carboxylate anion, and said foamed gel further containing a surfactant, an aqueous solvent, and an added gas, and further wherein said foamed gel blocks flow of a migratory fluid in said soil.

5,462,391

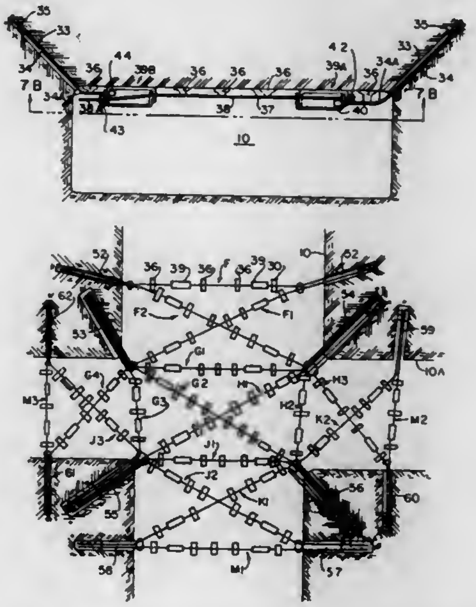
MINE ROOF SUPPORT CRIBBING SYSTEM

Brian R. Castle, and James J. Scott, both of Rolla, Mo., assignors to Scott Investment Partners, Rolla, Mo.

Filed Jan. 24, 1994, Ser. No. 185,262

Int. Cl.^{6} E21D *21/00;20/02*

U.S. Cl. 405—302.2 **3 Claims**



1. A roof support cribbing system for underground mine openings into each of intersecting passages having pillars at each of four corners to define a common area with entries into the area from each of the intersecting passages, the cribbing system comprising:
(a) first cable anchor means installed in each of the passage openings to the common area, each first cable anchor presenting first and second cable strands projecting into the adjacent passage;

(b) multi-cable anchors, one positioned at each of the corner pillars and having a plurality of cable strands projecting into the common area; with certain of the cable strands directed into adjacent passages;

(c) roof support cribbing means interconnecting first cable strands directed across the individual passages to effect roof support in each of the passages approaching said common area; and

(d) other roof support cribbing means interconnecting others of said plurality of cable strands from each of said multi-cable anchors at each of said corner pillars to form a composite roof support for the common area.

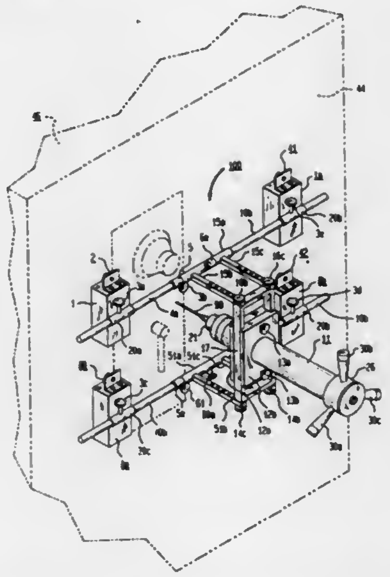
5,462,392

MAGNETICALLY ATTACHABLE, PORTABLE, ADJUSTABLE, AND COLLAPSIBLE SAFE DRILLING MOUNT FOR STEEL SAFES

Austin Hardwick, 5958 Rte. 60 East, Barboursville, W. Va. 25504

Filed Jul. 21, 1994, Ser. No. 251,272
Int. Cl.⁶ B23B ***47/28***

U.S. Cl. 408—76 **5 Claims**



1. A magnetically attachable, portable, adjustable, and collapsible safe drill mounting device for boring a hole in a steel safe comprising:

- (a) bracket assembly having a frame for a drilling barrel, including
  - (i) spaced frame mounting pipes, dimensioned to lie proximate to a surface of said steel safe;
  - (ii) a plurality of magnetic block means magnetically attached adjacent said steel safe attaching said frame mounting pipes to said steel safe;
- (b) said frame, including
  - (i) a generally U-shaped support bracket, including a bottom member terminating in legs which extend horizontally, said bottom member carried on one of said drill frame mounting pipes;
  - (ii) bearings for a rotating drilling shaft inside said drilling barrel; and
  - (iii) said bearings inside said barrel adapted for receiving thrust loads on said drill shaft and distributing said thrust loads to said barrel, drill frame and said magnetic block means.

5,462,393

DRILLING APPARATUS FOR PRODUCING DRILLED HOLES WITH UNDERCUTS

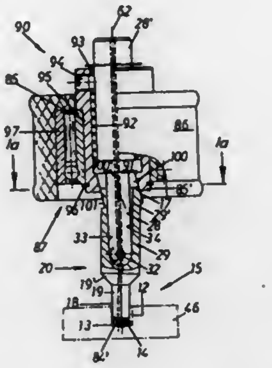
Karl Eischeid, Schulweg 23, 5250 Engelskirchen, Germany

Continuation of Ser. No. 865,063, Apr. 8, 1992, abandoned. This application Aug. 5, 1994, Ser. No. 286,387

Claims priority, application Germany, Apr. 10, 1991, 9104326 U

Int. Cl.⁶ B23B ***51/00***

U.S. Cl. 408—159 **15 Claims**



1. Drilling apparatus for producing drilled holes with undercuts using a drill having a side cutting blade edge protruding radially beyond the periphery of the drill shank, and a flattened portion upon its circumference, opposite the side cutting blade edge, the distance from the edge of the flattened portion to the tip of the cutting blade being slightly less than the diameter of a borehole to be undercut which makes possible the insertion of the drill shank and side cutting edge into the borehole, the drill shank being firmly connected with a connecting coupling having inner and outer sections pivoted to each other adjacent the drill shank, disposed in an articulated fashion between and connecting the drill and a drill driving mechanism, and having a drill shank-side coupling slidingly engaged with an axially movable indentor through inner and outer interengageable surfaces when the indentor is moved axially toward the drill-shank side coupling characterized in that the indentor overlaps the drill shank-side coupling at all times along an inclined interengagement section and is radially coupled positively with this coupling in a manner such that movement of the interengagement point of the shank-side coupling and the indentor varies the inclination of the drill shank.

5,462,394

LATCHMASTER SLIDING PULL UP HITCH

Thomas H. Engle, Cape Vincent, N.Y., assignor to Knorr Brake Holding Corp., Westminster, Md.

PCT No. PCT/US91/06576, § 371 Date Oct. 4, 1993, § 102(e) Date Oct. 4, 1993

Continuation-in-part of Ser. No. 581,384, Sep. 12, 1990, Pat. No. 5,112,172. This PCT application Sep. 12, 1991, Ser. No. 984,566

Int. Cl.⁶ B60P ***7/13***

U.S. Cl. 410—59 **4 Claims**

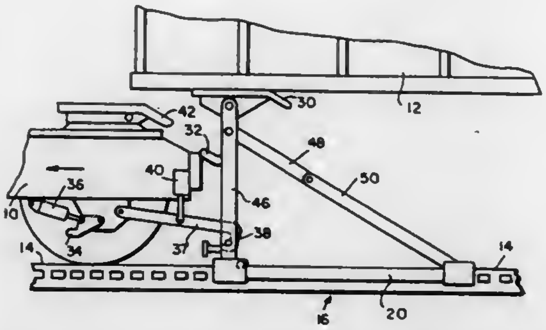
3. A stanchion to support trailers on a railroad car, comprising:

sled means for moving along a surface of a railroad car;

stand means, mounted to said sled means and having lowered and raised positions, for receiving and securing a portion of a trailer;

latch means on said led means having locked and unlocked positions for engaging and disengaging said railroad car to prevent and permit, respectively, movement of said sled means along said surface;

a cam connected to said latch means and having a cam surface which has a first and second position corresponding to said locked and unlocked positions of said latch means respectively; and



a cam follower connected to said stand means for engaging said cam surface to allow said cam surface to assume said second position, permitting said latch means to disengage said railroad car, only when said stand means is in said lowered position.

5,462,395

SOUND DECOUPLING CONNECTING ELEMENT

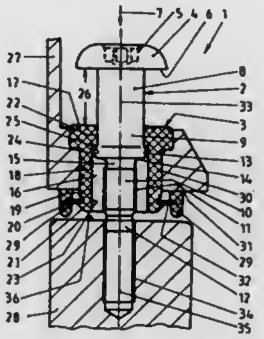
Klaus Damm, Homberg/Ohm; Walter J. Mages, Alsfeld, and Wolfgang Sommer, Gemünden, all of, Germany, assignors to Kamax-Werke Rudolf Kellerman GmbH & Co. KG, Osterode, Germany

Filed Feb. 22, 1994, Ser. No. 199,461

Claims priority, application Germany, Mar. 27, 1993, 43 10 002.3

Int. Cl.^{6} F16B *39/00*

U.S. Cl. 411—107 **7 Claims**



1. A sound insulating connecting element for connecting a first part having a bore hole and a second part having a threaded bore hole, with a gasket inserted between said first and second pares, said connecting element having a premounted position substantially retracted from the threaded bore hole of the second part and an end-mounted position inserted into the threaded bore hole of the second part, said connecting element comprising;

a screw having a shaft, an enlarged head at one end of said shaft, said shaft including a generally constant breadth portion adjacent said head, a threaded portion adjacent the distal end of said shaft, and a shoulder positioned between said constant breadth portion and said threaded portion and extending radially outwardly beyond said constant breadth portion and said threaded portion of said shaft for engagement with said second part when said element is in its end-mounted position;

a sound insulating sleeve-like formed body of an elastomer material for insertion into the bore hole of said first part, said formed body having a substantially constant breadth internal opening extending therethrough for receiving said screw, the breadth of said formed body internal opening matching the breadth of said shoulder for sliding engagement with said shoulder,

said formed body further including a radially inwardly projecting flange positioned between said outwardly extending shoulder and said head of said screw and sized and shaped for limited longitudinal slidable engagement with said screw shaft between said shoulder and said head and forming a friction area pairing with said screw shaft,

said formed body further including a continuation for projecting beyond said bore hole of the first part toward the second part,

said continuation including a mounting means for mounting a gasket to said connecting element in a position between the first and second parts,

whereby said screw can be moved through said insulating body from its premounted position toward its end-mounted position into threaded engagement with said second part as said outwardly extending shoulder of said screw and said inwardly extending flange of said formed body maintain the screw in alignment with the internal opening of said formed body and the gasket is maintained by said formed body between said first and second parts.

5,462,396

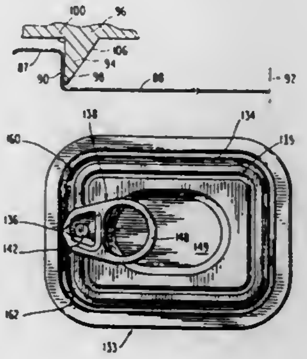
CONVENIENCE-FEATURE SHEET METAL END CLOSURE AND TOOLING APPARATUS

William T. Saunders, Weirton, W. Va., assignor to Weirton Steel Corp., Weirton, W. Va.

Division of Ser. No. 976,188, Nov. 13, 1992, Pat. No. 5,328,313, which is a division of Ser. No. 535,413, Jun. 8, 1990, Pat. No. 5,217,134. This application Apr. 7, 1994, Ser. No. 224,258

Int. Cl.^{6} B21D *51/38*

U.S. Cl. 413—67 **1 Claim**



1. Apparatus for use in forming and scoring a sheet metal convenience-feature end closure structure for a container body, said end closure structure including

an endwall panel,

peripheral chime seam metal disposed for joining the end closure structure to the container body, and

a unitary chuck wall extending between the chime seam metal and the endwall panel,

the endwall panel being substantially planar and countersunk, in relation to the peripheral chime seam metal, toward the interior of the container body as the end closure structure is oriented for assembly with the container body,

the chuck wall having configurational and dimensional characteristics matching those at the open end of the container body so as to interfit in contiguous relationship within such open end during assembly of the end closure structure with the container body,

said apparatus comprising:

scoring tooling means, including

a pad portion in confronting relationship with the endwall panel to be scored,

scoring knife structure, projecting a uniform dimension from the pad portion toward the endwall panel, and presenting

a scoring edge for forming a peripheral scoreline in the endwall panel at a location contiguous to the chuck wall so as to define a separable endwall panel enabling one-piece removal of solid-pack container contents;

said scoring tooling means being adapted for movement along an axis which is perpendicular to the plane of the endwall panel for scoring a peripheral scoreline in sheet metal of said endwall panel;

a peripheral scoreline contiguous to the chuck wall and defining a separable endwall panel enabling one-piece removal of solid-pack contents;

said scoring knife structure having a right-angled triangular configuration in a cross-sectional plane which includes the axis of movement while presenting a truncated configuration scoring edge confronting the endwall panel;

said scoring knife structure including

an outer peripheral wall which projects in substantially right-angled relationship from the pad portion toward the scoring edge,

said outer peripheral wall having a height which, as viewed in said cross-sectional plane, exceeds the combined height dimension of the chuck wall and the peripheral chime seam metal above the endwall panel to be scored, with said outer peripheral wall of the scoring knife structure fitting within, and in contiguous relationship to, the chuck wall during a scoring operation,

an inner side wall which extends from the scoring edge toward the pad portion, in acute-angled relationship with the outer peripheral wall as seen in said cross-sectional plane, so as to strengthen the scoring edge while enabling the angled inner wall to avoid contact during the scoring operation with profiling and rivet button configurations formed in the endwall panel during fabrication of the end closure structure;

said scoring tooling means for forming a peripheral scoreline in an end closure structure for a container body having predetermined non-circular dimensional and configuration characteristics at its open end;

said end closure structure presenting a substantially planar non-circular configuration endwall panel which is countersunk from said peripheral chime seam metal and joined thereto by said unitary chuck wall,

said endwall panel peripheral chime seam metal and the chuck wall each having dimensional and configurational characteristics corresponding to those of said container body open end, with said non-circular chuck wall being adapted to interfit in contiguous relationship with said container body open end as assembled for joinder by means of a chime seam, with

said non-circular configuration being selected from the group consisting of square, rectangular, oblong, and elliptical shapes so as to have a major dimension centrally-located axis dividing the endwall panel into mirror image halves which are uniformly symmetrical along said centrally-located axis; and

said scoring knife having said non-circular configuration, such that

said peripheral outer wall of said scoring knife structure abuts said chuck wall as said scoring edge forms said peripheral scoreline in said non-circular endwall panel contiguous to said chuck wall.

5,462,397
PROCESSING APPARATUS

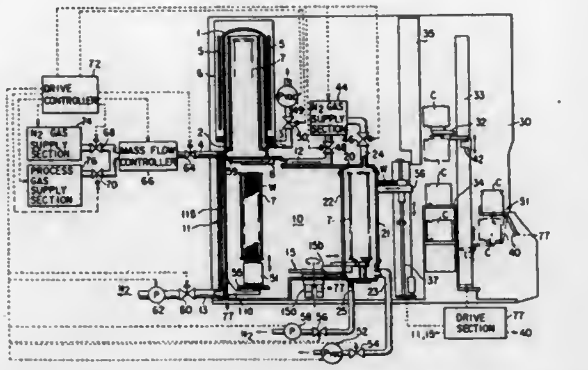
Katsuhikō Iwabuchi, Sagamihara, Japan, assignor to Tokyo Electron Limited, and Tokyo Electron Tohoku Limited, both of, Japan

Filed Mar. 15, 1994, Ser. No. 213,096

Claims priority, application Japan, Mar. 16, 1993, 5-081329

Int. Cl.^{6} C23C *16/00*

U.S. Cl. 414—222 **12 Claims**



1. A processing apparatus comprising:

a processing chamber for providing a predetermined processing to a processing object;

a transfer chamber having transfer means for transferring a holding member holding the processing object to/from said processing chamber;

inactive gas supply and exhaust means for maintaining inside of said transfer chamber to be in a predetermined inactive gas atmosphere;

a holding member containing chamber, provided adjacent to said transfer chamber, and having a capacity being capable of containing at least said holding member, said transfer means being capable of transferring said holding member to/from the transfer chamber in a state that an atmosphere of the transfer chamber is isolated from outside air;

inside atmosphere substituting means for providing substitution so as to set inside of said holding member containing chamber to be in a vacuum atmosphere or a predetermined inactive gas atmosphere; and

a processing object transfer chamber, provided to be adjacent to said holding member containing chamber, having transfer means for transferring the processing object to the holding member of said holding member containing chamber.

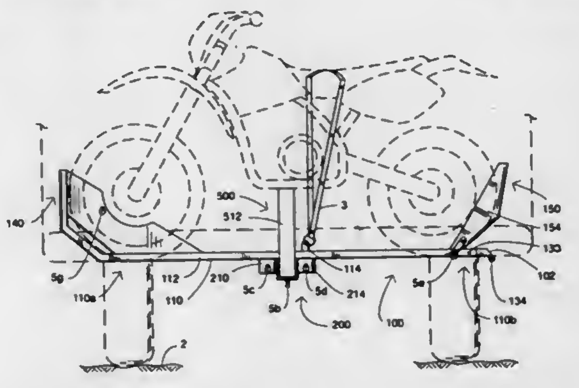
5,462,398
MOTORCYCLE CARRIER

Robert F. Hymer, Rte. 11, Box 2433, Lexington, N.C. 27292

Filed Jan. 11, 1994, Ser. No. 180,133

Int. Cl.^{6} B60P *3/07*

U.S. Cl. 414—462 **10 Claims**



1. A motorcycle carrier for carrying a motorcycle on a vehicle having a hitch, comprising:

a. a hitch mount having a first end and a second end, said first end detachably securable to the hitch of the vehicle;

b. a pivot mount detachably mounted on said second end of said hitch mount, said pivot mount including a first hinge element extending from said pivot mount and a first brace element extending from said pivot mount;

c. a ramp assembly tier supporting the motorcycle, said ramp assembly including a second hinge element, a second brace element and a platform, said platform having a first end and a second end and extending continuously from said first end to said second end and being configured to receive and support the wheels of the motorcycle;

d. a first coupling arranged and configured to pivotally couple said first hinge element and said second hinge element;

e. a second coupling arranged and configured to couple said first brace element and said second brace element, said second coupling being removable;

f. wherein, when said second coupling is removed, said ramp assembly is rotatable about said first coupling between a transporting position and a loading position; and

g. wherein said pivot mount may be removed from said hitch mount, rotated 180°, and remounted on said hitch mount so that said pivot mount and said ramp assembly may be selectively mounted with respect to the vehicle for selectively loading and unloading a motorcycle from either side of the vehicle.

5,462,399

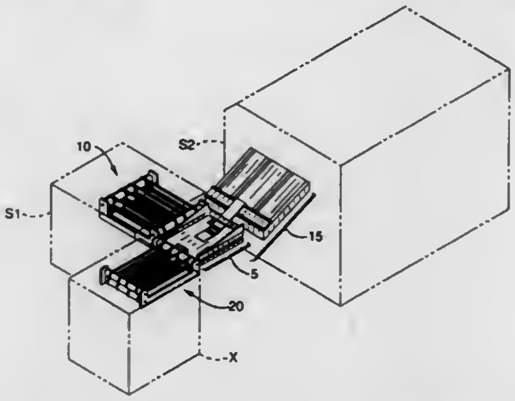
VERTICAL TRAY COLLATOR WITH SHEET DISCHARGE PUSHER MEMBER

Charles B. Clupper, 1120 Oak Tree Cir., El Dorado Hills, Calif. 95762; Jonathan D. Emigh, 7050 Aukum Rd., Somerset, Calif. 95684; Steven L. Mulkey, 2687 Hillcrest Dr., Cameron Park, Calif. 95682; Robert L. Fehringer, 3395 Rio Vista, Camino, Calif. 95709; Brett J. Flickner, 259 Wellfleet Cir., Folsom, Calif. 95630; Daniel M. Saldana, 11082 Erla Ct., Rancho Cordova, Calif. 95670, and Frank W. Delfer, III, 7460 Shelborne Dr., Loomis, Calif. 95650

Filed Jul. 15, 1994, Ser. No. 276,092

Int. Cl.^{6} B65G *57/00;* B65H *31/30;39/05*

U.S. Cl. 414—790.3 30 Claims



1. A collating apparatus for producing a document packet from an incoming document page or pages, comprising:

a) a collating means having a plurality of vertically displaced collating trays with each said collating tray accepting a single document page or multiple document pages and

b) outputting means coupled to said collating means for transferring said incoming page or pages from said collating means as the document packet to a subsequent processing means.

5,462,400

METHOD AND APPARATUS FOR MECHANICAL LOADING AND UNLOADING

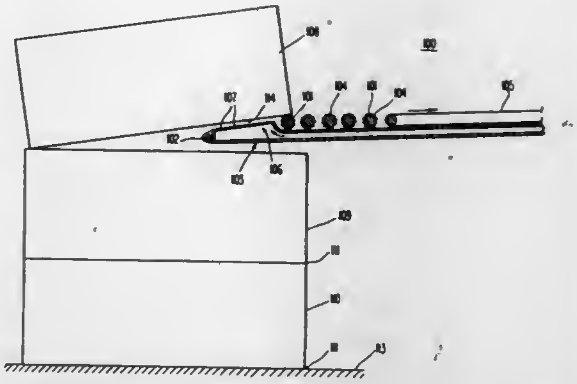
Henri Bonnet, Atlanta, Ga., assignor to United Parcel Service of America, Inc., Atlanta, Ga.

Continuation of Ser. No. 795,882, Nov. 21, 1991, abandoned. This application Jan. 21, 1994, Ser. No. 184,853

Int. Cl.^{6} B65G *59/02*

U.S. Cl. 414—796.5 12 Claims

1. An apparatus for handling a plurality of irregularly stacked packages comprising an insertable pallet, said insertable pallet having vertically translatable wedge means for acquiring a first of said stacked packages by thrusting a leading edge of said wedge means at a substantially horizontal seam between said first package and a second package to separate said first and second packages by simultaneously applying upward force against a lower surface of said first package and downward force against an upper surface of said second package until said lower surface of said first package is brought into contact with live roller means for moving said first package along said pallet, said wedge means supporting said live roller means only in a region set back from said leading edge.



5,462,401

METHOD OF SEPARATING TWO ROWS OF CIGARETTE PACKETS

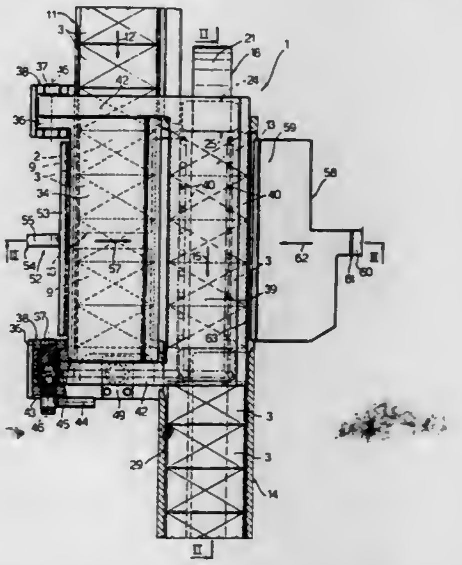
Marco Brizzi, Zola Predosa, and Antonio Gamberini, Bologna, both of, Italy, assignors to G. D Societa' Per Azioni, Bologna, Italy

Filed May 25, 1993, Ser. No. 66,861

Claims priority, application Italy, May 26, 1992, BO92A0210

Int. Cl.^{6} B65G *59/02*

U.S. Cl. 414—797 7 Claims



1. A method of advancing cigarette packets (3) along a feeding path, the method comprising the steps of:

advancing two superimposed rows (4, 5) of cigarette packets (3) along a first portion of said path and in a first direction (12) to a separating device (1), each packet of each of said superimposed rows being in direct contact with a corresponding packet of the other of said superimposed rows, and each said row having a longitudinal axis parallel to said first direction;

transversely separating the two rows (4, 5) by moving, inside the separating device (1), at least one row (4) in relation to other and in a second direction (39*a*) perpendicular to the first direction so as to completely separate each said packet from said corresponding packet;

inserting plate means (58) between the already separated rows (4, 5), the plate means forming part of the separating device; and

removing both said two superimposed and separated rows from said separating device by advancing the two rows along a second portion of said path in a third direction parallel to said plate means, which plate means are maintained in a fixed position between said two rows (4, 5) as the rows (4, 5) are removed from said separating device (1).

5,462,402

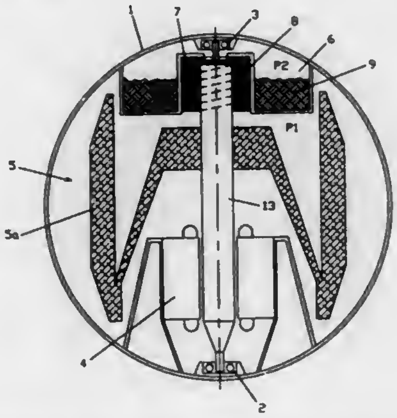
FLYWHEEL ENERGY STORAGE SYSTEM WITH INTEGRAL MOLECULAR PUMP

Daniel Bakholdin, Van Nuys; Robert W. Bosley, Cerritos, and Chris C. Pearson, Woodside, all of Calif., assignors to Rosen Motors, L.P., Woodland Hills, Calif.

Filed Feb. 22, 1994, Ser. No. 199,897

Int. Cl.^{6} F01D *1/36*

U.S. Cl. 415—90 **16 Claims**



1. An integral flywheel energy storage system, comprising:

a sealed housing;

a baffle including an orifice dividing said housing into a low pressure first chamber and a relatively high pressure second chamber;

a shaft suspended between first bearings located in said first chamber and second bearing in said second chamber, said shaft being disposed within said orifice;

a flywheel disposed within the first chamber spinning at high speed; and

a molecular pump operatively connected so as to be driven by said shaft for pumping gas molecules from said first chamber to said second chamber.

5,462,403

COMPRESSOR STATOR VANE ASSEMBLY

John L. Pannone, Glastonbury, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Mar. 21, 1994, Ser. No. 215,335

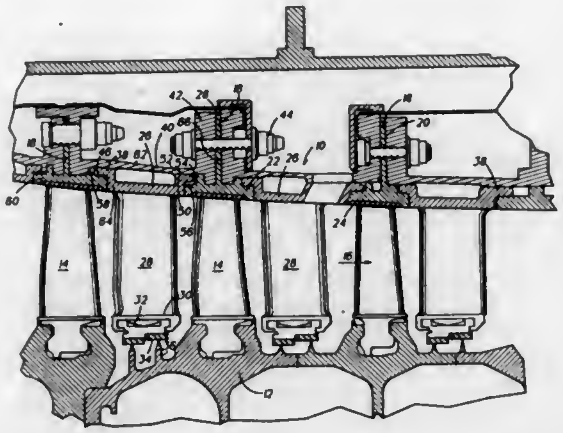
Int. Cl.^{6} F01D *9/04;11/08*

U.S. Cl. 415—173.1 **3 Claims**

1. A compressor stator vane assembly comprising:

a plurality of full ring outer air seals **18** each of a "T" cross-section having a base and two arms, said arms each having an end portion remote from said base, with the base **20** of the "T" extending radially outwardly;

a full ring case **40** flanged to the base **20** of adjacent air seals and outwardly spaced from the end portion of the arms **22** of said air seals, whereby a slot **46** is formed between the end portion of each arm and said case;



an arcuate vane support segment **26** having axially extending feet **38**, said axially extending feet being the sole axially extending feet on said arcuate vane support segment and located on the outer circumference of said arcuate vane support segment, each one projecting into one of said slots **46**; and

a plurality of stator vanes **28** secured to and extending radially inward from said vane support segment **26**.

5,462,404

ARRANGEMENT FOR AN AIR SUPPLY OF A RADIAL FAN OR BLOWER

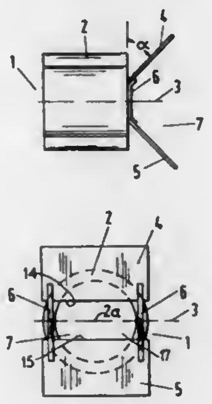
Wilfried Durth, Landsberg/Lech, Germany, assignor to Rational GmbH, Landsberg/Lech, Germany

Filed Apr. 18, 1994, Ser. No. 229,304

Claims priority, application Germany, Apr. 20, 1993, 43 12 825.4

Int. Cl.^{6} F04D *29/40*

U.S. Cl. 415—183 **9 Claims**



1. An arrangement for an air supply in a radial fan having an intake region, said arrangement comprising air guide means being disposed in the region of the fan and including two air baffle regions lying opposite one another and symmetrically relative to one another with respect to a plane of symmetry of the intake region that contains the rotational axis of the fan, said air baffle regions having edges adjacent the fan lying within the aperture clearance of the fan and said air baffle regions extending obliquely outward from these edges in relationship to the plane of symmetry of the intake region.

5,462,405

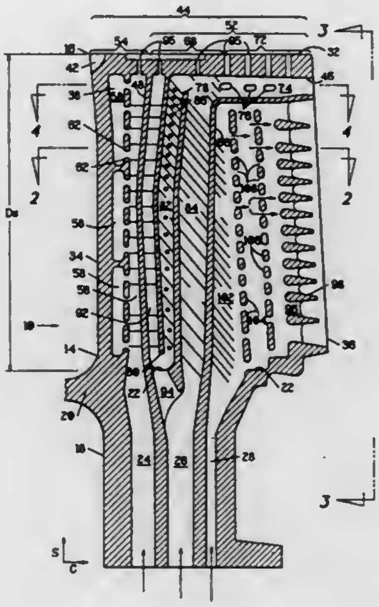
COOLABLE AIRFOIL STRUCTURE

Richard W. Hoff, Glastonbury, and David R. Martin, East Hartford, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Continuation of Ser. No. 981,952, Nov. 24, 1992, abandoned. This application Jun. 20, 1994, Ser. No. 262,396

Int. Cl.^{6} F01D *5/18*

U.S. Cl. 416—97 R **6 Claims**



1. For a coolable airfoil structure of the type having a leading edge, a trailing edge, a root section in communication with a source of cooling air, a first end adjacent the root section, an airfoil tip region, and a second end at the tip region, the tip region including a chordwisely extending tip passage extending rearwardly through the tip region to the trailing edge, and a tip wall which bounds the tip passage, the improvement which comprises:

a first spanwisely extending supply passage and a second spanwisely extending supply passage, a rib which extends spanwisely to bound the first and second passages in the spanwise direction, each passage extending from the first end adjacent the root section toward the second end to the tip region and each independent of the other being in flow communication with the chordwisely extending tip passage, the first passage being disposed between the leading edge and the second passage and being chordwisely forward of the second passage and separated from the second passage only by the rib the first passage and second passage extending outwardly to supply cooling air to the tip region and the rib being spaced from the tip wall to permit mixing of the cooling air discharged from the first passage and the second passage;

a plurality of cooling air holes extending from the first forwardmost passage to the exterior of the airfoil to cool the surface of the airfoil adjacent the second rearmost passage to block heat transfer to the second rearmost passage from the exterior and to discharge a portion of the heated cooling air from the first forwardmost passage prior to the air mixing with air from the second passage in the tip passage.

5,462,406

CYCLODIAL PROPULSION SYSTEM

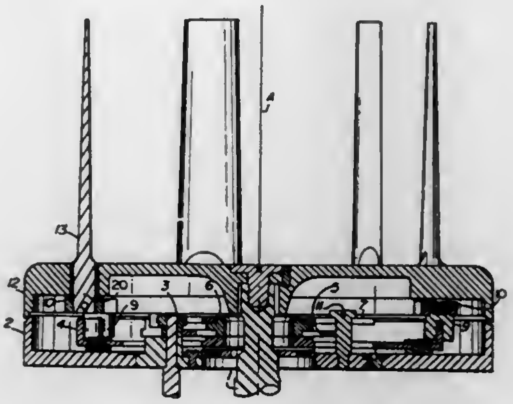
Barry A. Ridgewell, Delta, and Miles Fenton, North Vancouver, both of, Canada, assignors to Vitron Systems Inc., Vancouver, Canada

Filed Aug. 19, 1993, Ser. No. 108,449

Int. Cl.^{6} F03D *3/06*

U.S. Cl. 416—111 **12 Claims**

1. A cycloidal propeller system comprising:



a fixed base;

a propeller hub rotatable about a central axis and mounting a plurality of circumferentially spaced propeller blades for rotation therewith about the central axis, said hub mounting said blades for pivotal movement about blade axes generally parallel to said central axis whereby the axes of said blades define a circular orbit upon rotation of said hub about said central axis;

a member carrying a circular track having an axis extending in the direction of said central axis and carried by said base for non-rotational movement relative to a base in a plane normal to said central axis whereby said track is movable between positions locating the axis of the track offset from and coincident with the central axis, respectively;

means for moving said member in said plane to offset the axis of said track relative to said central axis;

each said blade having a lever and a guide carried by said hub for rotation therewith about said central axis, said guides being engageable with said track such that said guides and said levers change the pitch of the blades in response to movement of said member in said plane offsetting the track axis relative to the central axis thereby to produce thrust in a predetermined direction in response to rotation of said blades about said central axis;

the diameter of said track being larger than the diameter of said orbit such that, upon movement of said member to offset said track axis relative to said central axis, the blade pitch angles in a forward half-cycle increase from zero pitch on a side of said orbit approximately normal to the predetermined direction of thrust, to a maximum on the forward side of said orbit, and then decrease to zero pitch on an opposite side of the orbit normal to the direction of thrust and, in an aft half-cycle, increase from zero pitch at said opposite side of the orbit to a maximum pitch angle on the aft side of said orbit and then return to zero pitch at the completion of one revolution of said hub, the maximum pitch angle on the aft side of said orbit being greater than the maximum pitch angle on the forward side of said orbit.

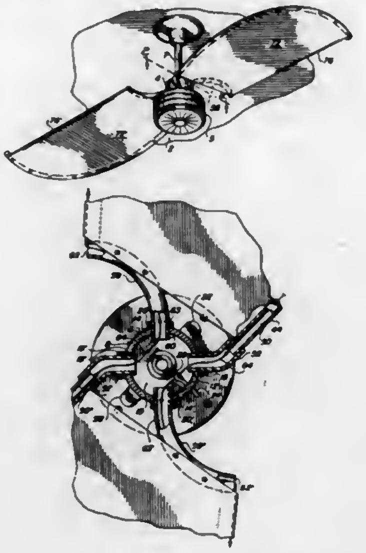
5,462,407

IMPROVED CEILING FAN BLADE AND HUB ASSEMBLY

Joseph Calvo, Miami, Fla., assignor to Jeffrey S. Shapiro, N. Miami Beach, Fla.

Filed May 6, 1994, Ser. No. 238,925
Int. Cl.⁶ F01D *5/00*

U.S. Cl. 416—132 A **20 Claims**



1. A ceiling fan blade assembly rotatably driven by a motor, said assembly comprising:

(a) a hub structured and disposed for coupling to the motor for rotation therewith, said hub including means for fixed attachment to the motor;

(b) a cord having a first end and a second end;

(c) means structured and disposed within the assembly for fixedly coupling said first and second ends of said cord;

(d) a pair of substantially oppositely disposed blade frames extending radially outwardly from said hub, each said blade frame comprising:

(i) an elongate tubular member, said tubular member including a distal end, a proximal end, and an axial passageway therethrough;

(ii) means connecting said proximal end of said tubular member to said hub;

(iii) means for adjusting said blade frame at a selected pitch, said pitch adjusting means being fixedly engaged to said hub;

(iv) said cord extending internally from said proximal end through said axial passageway of said tubular member, said cord extending exteriorly from said distal end of said tubular member to said pitch adjusting means; and

(e) said cord extending between said blade frames.

5,462,408

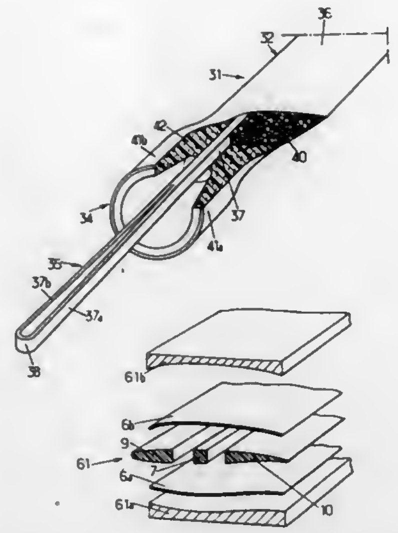
BLADE MADE OF THERMOPLASTIC COMPOSITE, IN PARTICULAR FOR DUCTED TAIL ROTOR OF A HELICOPTER, AND ITS METHOD OF MANUFACTURE

René L. Coffy, Sausset les Pins, France, assignor to Europcopter France, Marseille, France

Filed Dec. 14, 1993, Ser. No. 165,862
Int. Cl.⁶ B64C *27/48*

U.S. Cl. 416—134 A **19 Claims**

1. A blade, essentially made of composite material, for a rotorcraft rotor, and comprising:



a composite rigid shell, with an aerodynamic profile, elongated longitudinally along the span of the blade, one longitudinal end of which is turnable towards a hub of the rotor and includes a blade root, said shell including at least one layer of reinforcing fibres agglomerated by a matrix comprising a synthetic rigidifying resin,

at least one spar having at least one part housed substantially longitudinally in the shell and including at least one elongate composite bar of continuous and unidirectional reinforcing fibres agglomerated by a matrix comprising a synthetic rigidifying resin, and

at least one composite filling body arranged in the shell between the shell and said at least one spar, said at least one filling body including reinforcing fibres agglomerated by a matrix comprising a synthetic rigidifying resin,

the resin of the matrices of the shell, of said at least one filling body and of each bar of said at least one spar comprises a thermoplastic resin, which assembles together and provides cohesion between the shell, each part of said at least one spar housed in the shell and said at least one filling body.

12. A method for manufacturing a blade for a rotorcraft rotor comprising a composite shell having a blade rooting part and a lower-surface skin and an upper-surface skin which are laminated, at least one spar and a composite filling body arranged in the shell between the shell and the at least one spar, the method comprising:

producing thermoplastic composite components of the blade in a form of prefabricated elementary pieces;

arranging the prefabricated elementary pieces in a mould for assembly by heating under pressure, the mould comprising a lower mould part and an upper mould part including complementary internal impressions having respectively the shape of the lower-surface skin and of the upper-surface skin of the blade, such that said prefabricated elementary pieces occupy, in the mould, the respective positions which they occupy in the blade;

closing the mould and heating said prefabricated elementary pieces to a temperature sufficient to melt the thermoplastic matrix, under a pressure sufficient to ensure continuity of the thermoplastic matrix between said prefabricated elementary pieces and to assemble them by melting under pressure;

cooling the mould to solidify the thermoplastic matrix and rigidify all the elementary pieces thus assembled;

releasing the blade thus obtained from the mould; and

attaching rings, by bonding or by crimping, around a blade root cuff attached around said blade root if said blade root is not made of thermoplastic composite and already assembled by melting under pressure with the other prefabricated elementary pieces of the blade.

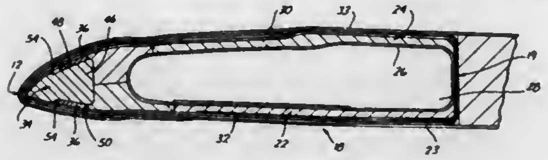
5,462,409

LEADING EDGE WEIGHT RETENTION ASSEMBLY FOR A HELICOPTER ROTOR

Michael C. Frengley, Chandler, and Thu N. Vu, Tempe, both of Ariz., assignors to McDonnell Douglas Helicopter Co., Mesa, Ariz.

Filed Mar. 18, 1994, Ser. No. 210,579
Int. Cl.^{6} B64C *27/46*

U.S. Cl. 416—144 **18 Claims**



1. A rotor blade for a helicopter or the like, comprising:

a leading edge and a trailing edge;

a weight assembly installed in said blade adjacent to said leading edge, said weight assembly including a weight element having an outboard end and a retention element at least partially surrounding said weight element, said retention element comprising a strap which is mapped about the outboard end of the weight element;

a spar:

wherein said strap is co-cured with the spar and the weight element has a length sufficient to ensure that the co-cured joint between the strap and the spar is strong enough to permit the strap to substantially solely retain the weight element during operation of the rotor blade.

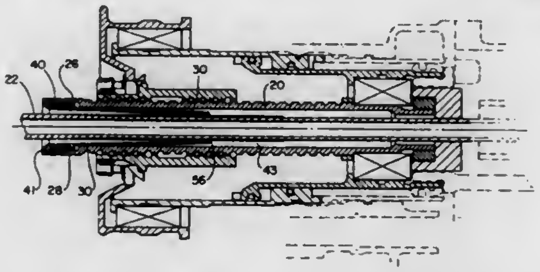
5,462,410

DAMPER AND SEAL FOR PROPELLER QUILL SHAFT

Dale E. Smith, Windsor, and Edward W. Chase, III, West Suffield, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Nov. 10, 1994, Ser. No. 338,053
Int. Cl.^{6} B64C *11/30*

U.S. Cl. 416—165 **10 Claims**



1. For a torque transmission system for transmitting torque from one rotating component to another rotating component through a quill shaft, said quill shaft having a radially extending flange, said one rotating component being concentrically mounted relative to said another rotating component and lubricating fluid flowing therebetween, said one rotating component having an end axially spaced from said flange and defining therewith an annular groove, an annular seal means disposed in said annular groove and bearing against the end of said one rotating component and said flange for absorbing the vibratory energy encountered by said one rotating component and said another rotating component, and said seal means sealing the lubricating fluid between said one rotating component and said another rotating component.

5,462,411

DEVICE FOR CONNECTING BLADES TO A HUB

Emilio Bianchi, Lugano-Paradiso, Switzerland, assignor to Ceute S.A., Lugano, Switzerland

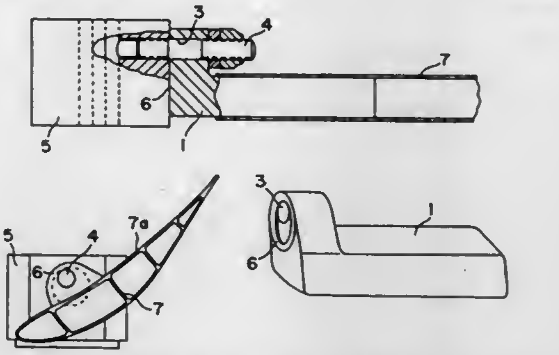
PCT No. PCT/EP93/02815, § 371 Date Jun. 10, 1994, § 102(e) Date Jun. 10, 1994, PCT Pub. No. WO94/09277, PCT Pub. Date Apr. 28, 1994

PCT Filed Oct. 13, 1993, Ser. No. 244,780

Claims priority, application Switzerland, Jan. 19, 1992, 3233/92

Int. Cl.^{6} F04D *29/38*

U.S. Cl. 416—202 **5 Claims**



1. A device for connecting a blade (7) to a hub (5) in a propeller of one of a fan and an aircraft, with a variable fitting in at least a moving position, comprising:

an L-shaped means (1) for connecting the blade (7) to the hub (5) so that an attachment of the blade (7) to the hub (5) has a longitudinal axis eccentric with respect to a longitudinal axis of the hub (5), said L-shaped means (1) having a first long leg aligned parallel with a longitudinal axis of the blade (7), said L-shaped means (1) also having a second short leg aligned perpendicular to a flat plane of the blade (7) but parallel to a rotational axis of the hub (5);

a screw means (4) for fastening the second short leg of the L-shaped means (1) to the hub (5), said screw means (4) being aligned parallel to the flat plane of the blade (7) but having a longitudinal axis spaced from the flat plane of the blade (7); and

a circular crown means (6) for pressing the L-shaped means (1) to the hub (5).

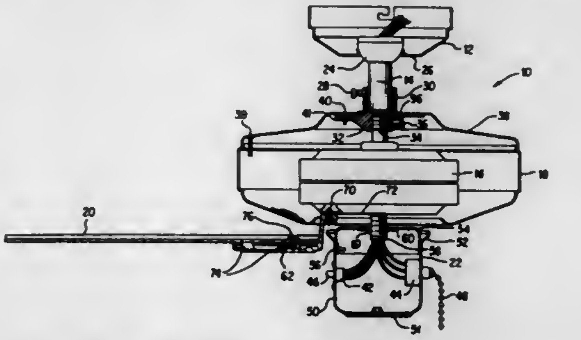
5,462,412

CEILING FAN

Robert L. Scofield, Cordova, and Richard A. Pearce, Memphis, both of Tenn., assignors to Hunter Fan Company, Memphis, Tenn.

Continuation of Ser. No. 49,958, Apr. 19, 1993, abandoned, which is a continuation of Ser. No. 827,285, Jan. 29, 1992, abandoned. This application Jan. 18, 1994, Ser. No. 183,572
Int. Cl.^{6} F04D *29/34;29/64*

U.S. Cl. 416—210 R **7 Claims**



1. A ceiling fan comprising:

a motor, comprising a generally stationary member having a top portion and a bottom portion, and a rotor having a bottom portion, said rotor being rotatable about said stationary member upon operation of said motor;
means for suspending said motor from a ceiling, including
  a canopy removably securable to the ceiling, having a centrally located opening formed therein, the perimeter of said opening defining a socket,
  an adapter having top and bottom portions, said bottom portion being secured to said top stationary portion of said motor and said top portion being received within said opening in said canopy,
  a ring member disposed within said canopy, having a central opening for receiving said top portion of said adapter, said ring member being adapted to engage said canopy generally adjacent said socket, and
  means for fastening said ring member to said adapter, thereby securing said motor to said canopy;
a motor housing enclosing at least a portion of said motor;
switch means for selectively controlling the operation of said motor;
a plurality of blade irons rotatable with said rotor, each having a proximate end removably securable by suitable fastening means to said bottom portion of said rotor and a distal end extending radially outwardly therefrom;
a plurality of blades, equal in number to said blade irons, each having a proximate end secured to said distal end of a corresponding blade iron;
a switch housing for containing said switch means, securable to said bottom portion of said stationary member, said switch housing having a side member, an upper edge in close proximity to said fastening means, and a lower edge spaced vertically apart from said upper edge, wherein said fastening means are disposed radially outwardly from said side member, and
  said upper edge of said switch housing is flared radially outwardly to substantially conceal said fastening means when the ceiling fan is viewed from below.

5,462,413

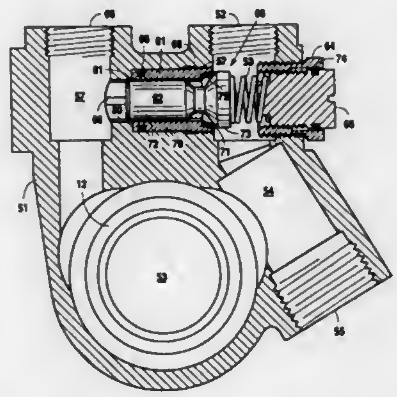
DISPOSABLE RELIEF VALVE SEAT FOR POSITIVE DISPLACEMENT PUMP

Alfred A. Schroeder, San Antonio, Tex., assignor to Lancer Corporation, San Antonio, Tex.

Continuation of Ser. No. 145,802, Oct. 29, 1993, abandoned. This application Oct. 28, 1994, Ser. No. 334,173

Int. Cl.^{6} F04B *49/00;* **F16K** *15/00;17/00;21/04*

U.S. Cl. 417—310 **6 Claims**



1. A disposable component for a relief valve that regulates the flow of fluid through a relief passageway of a positive displacement pump, comprising:
a hollow sleeve formed to fit into the relief passageway of the positive displacement pump; and
longitudinal grooves on the interior surface of said hollow sleeve for permitting fluid passage and for providing an engaging surface that allows said hollow sleeve to be placed into and removed from the relief passageway of the positive displacement pump.

5,462,414

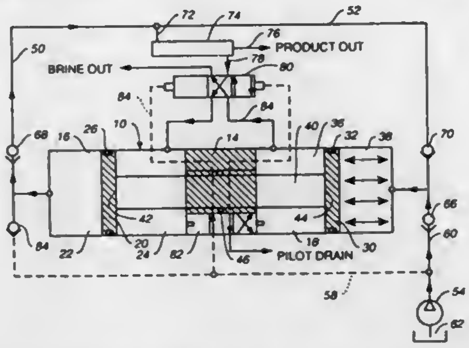
LIQUID TREATMENT APPARATUS FOR PROVIDING A FLOW OF PRESSURIZED LIQUID

Clark Permar, P.O. Box 701, Bolinas, Calif. 94924

Filed Jan. 19, 1995, Ser. No. 375,530

Int. Cl.^{6} F04B *39/16*

U.S. Cl. 417—313 **10 Claims**



1. Liquid treatment apparatus for providing a flow of pressurized liquid, said apparatus comprising, in combination:
a hydraulic cylinder defining a cylinder interior;
a divider dividing said cylinder interior into first and second compartments;
a first piston head within said cylinder interior, said first piston head being movably mounted in said first compartment and forming a liquid-tight seal with said hydraulic cylinder to subdivide said first compartment into a first set of two subcompartments, said subcompartments of said first set of two subcompartments located at opposed sides of said first piston head;
a second piston head within said cylinder interior spaced from said first piston head, said second piston head being movably mounted in said second compartment and forming a liquid-tight seal with said hydraulic cylinder to divide said second compartment into a second set of two subcompartments, said subcompartments of said second set of two subcompartments located at opposed sides of said second piston head;
a double-ended ram member movably mounted within said cylinder interior and located between said first piston head and said second piston head, with a first end of said ram member unattached to but engageable with said first piston head within a single subcompartment of said first set of two subcompartments and a second end of said ram member unattached to but engageable with said second piston head within a single subcompartment of said second set of two subcompartments, said ram member extending through said divider, movable relative to said divider, and forming a fluid-tight seal with said divider;
first liquid flow path defining means defining a first liquid flow path extending between the two subcompartments of said first set of two subcompartments;
second liquid flow path defining means defining a second liquid flow path extending between the two subcompartments of said second set of two subcompartments;
pressurized liquid delivery means having an outlet for pressurized liquid;
control means for alternately introducing pressurized liquid from said pressurized liquid delivery means outlet into said first and second compartments to cause reciprocal movement of said piston heads and ram member within said cylinder interior and pressurization and flow of liquid through said liquid flow paths from the subcompartments of the sets of two

subcompartments not accommodating a ram member end to their respective subcompartments accommodating a ram member end; and

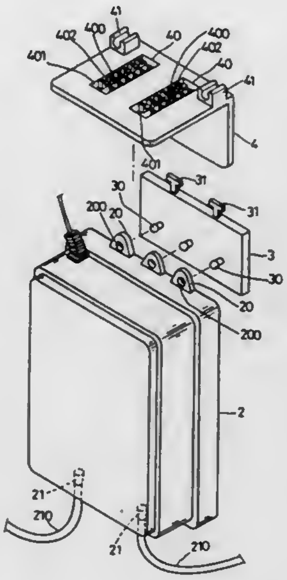
liquid exit path defining means defining a liquid exit path communicating with said liquid flow paths for discharging excess pressurized liquid from the subcompartments not accommodating a ram member end and not entering the subcompartments accommodating a ram member end.

5,462,415

PUMP HANGER FOR AN AQUARIUM

Shan-Hu Chen, 483 Hsin-Sing Road, Tainan, Taiwan, Prov. of China

Filed Jul. 18, 1994, Ser. No. 276,633
Int. Cl.^{6} A01K *63/04*; F04B *53/22*
U.S. Cl. 417—360 **1 Claim**



1. A pump hanger for an aquarium comprising:

a pump having more than one upright projections provided on an upper side edge;

a movable vertical plate preferably shaped rectangular, having one or more sidewise posts spaced aligned horizontal on an outer vertical side to fit in the upright projections of the pump to combine the movable plate with the pump, and one or more T-shaped keys spaced on an upper side surface;

an L-shaped locating plate frame having a horizontal portion and a vertical portion, the horizontal portion having one or more rectangular recesses spaced on an upper surface and two C-shaped clamps on two opposite sides of the upper surface for two air tubes of the pump to be pressed tightly therein, each said recess having a longitudinal center passageway, a lateral through hole formed at the front of the center passageway of each said recess, a plurality of divided grooves on both sides of said passageway; and

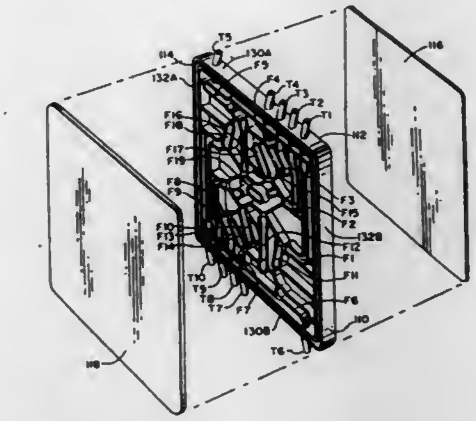
said T-shaped key(s) fitting up through said through hole(s) of the recess(es) of the L-shaped frame and being moved to engage any of the divided grooves selectably to secure said movable vertical plate, said movable vertical plate being possible to be adjusted in its position, said movable vertical plate and the vertical portion of said frame forming a distanced space adjustable according to the thickness of an aquarium glass so that this pump hanger can be hung on a vertical glass of an aquarium.

5,462,416

PERISTALTIC PUMP TUBE CASSETTE FOR BLOOD PROCESSING SYSTEMS

T. Michael Dennehey, Arlington Heights; Richard L. Brown, Northbrook, both of Ill., and Warren P. Williamson, Loveland, Ohio, assignors to Baxter International Inc., Deerfield, Ill.

Filed Dec. 22, 1993, Ser. No. 173,517
Int. Cl.^{6} F04B *43/08*
U.S. Cl. 417—477.2 **41 Claims**



1. A liquid flow cassette comprising

a housing having an interior wall that divides the housing into a first interior area and a second interior area,

first and second pump ports on the housing,

a flexible tubing loop that extends between the first and second pump ports outside the housing for engagement with an external peristaltic pump element,

a liquid port on the housing attachable to a length of tubing that extends outside the housing interior, and

liquid passages formed within the first interior area and communicating with the liquid port, the first pump port, and the second pump port,

valve means formed within the second interior area responsive to the application of external force for controlling liquid flow through the liquid passages,

a sensing chamber formed within the second interior area and communicating with at least one liquid passage,

a first generally rigid wall that overlies the first interior area and externally seals the liquid passages, and

a second generally flexible wall that overlies the second interior area and externally seals the valve means and the sensing chamber, the second wall flexing in response to external forces applied to control fluid passage through the valve means, the second wall also flexing to transmit information regarding liquid pressure present within the at least one liquid passage to an external sensing element.

5,462,417

PERISTALTIC PUMP WITH LINEAR PUMP ROLLER POSITIONING MECHANISM

Arthur S. Chapman, Solvang, Calif., assignor to Baxter International Inc., Deerfield, Ill.

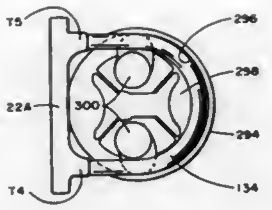
Filed Dec. 22, 1993, Ser. No. 175,204
Int. Cl.^{6} F04B *43/08*
U.S. Cl. 417—477.7 **13 Claims**

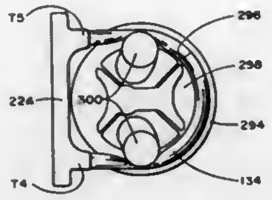
1. A peristaltic pump comprising

a pump rotor rotatable about an axis,

a first and second pump rollers carried for rotation on the pump rotor,

first linkage coupled to each pump roller to move each pump roller radially of the axis of rotation between a retracted position free of contact with pump tubing and an extended position making operative contact with a pump tubing,





a single actuating rod that extends coaxially along the axis of rotation, the rod having a distal end and a proximal end,

an actuator coupled to the proximal rod end for advancing the rod along the axis of rotation in a forward direction toward the pump rotor and in a rearward direction away from the pump rotor, and

second linkage coupling the distal rod end to the pump rotor for common rotation with the rotor about the axis of rotation while coupling the first linkage to the distal rod end to convert advancement of the actuating rod along the axis of rotation in response to the actuator means into Simultaneous movement of both pump rollers radially of the axis of rotation between their respective retracted positions and their respective extended positions.

5,462,418

SCROLL TYPE COMPRESSOR EQUIPPED WITH MECHANISM FOR RECEIVING REACTION FORCE OF COMPRESSED GAS

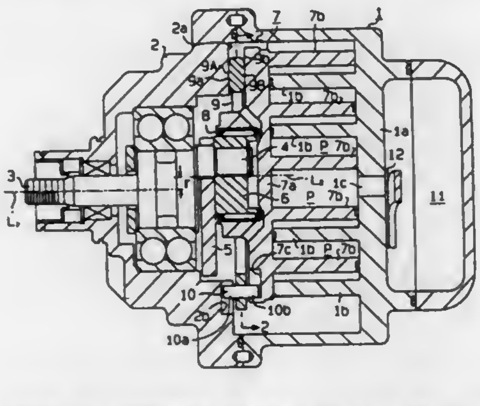
Izuru Shimizu; Tetsuo Yoshida; Masao Iguchi, and Tetsuhiko Fukanuma, all of Kariya, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

Continuation-in-part of Ser. No. 128,827, Sep. 29, 1993. This application Apr. 12, 1994, Ser. No. 226,508

Claims priority, application Japan, Apr. 13, 1993, 5-018758 U

Int. Cl.^{6} F04C ***18/04;*** **F16D** ***3/04***

U.S. Cl. 418—55.3 **10 Claims**



1. A scroll type compressor having a fixed scroll and a movable scroll revolvably supported, facing said fixed scroll, with a compression chamber defined between said fixed and movable scrolls, in order to provide compressed gas, said compressor comprising:

a pressure receiving member for receiving the compression reaction force of said gas produced in said compression chamber which acts on said movable scroll;

a base plate provided on said movable scroll;

a turnable ring disposed between said pressure receiving member and said base plate, said ring having first and second surfaces respectively facing said pressure receiving member and said base plate;

a plurality of first elements each associated with and fitted into a respective one of a plurality of first recesses, said first elements and first recesses being disposed between said pressure receiving member and said first surface of said turnable ring with said first elements being disposed at predetermined circumferentially spaced intervals on one of said pressure receiving member and said first surface of said turnable ring, and said first recesses being correspondingly disposed in the other of said pressure receiving member and said first surface of said turnable ring;

a plurality of second elements each associated with and fitted into a respective one of a plurality of second recesses, said second elements and second recesses being disposed between said base plate and said second surface of said turnable ring with said second elements being disposed at predetermined circumferentially spaced intervals on one of said base plate and said second surface of said turnable ring, and said second recesses being correspondingly disposed in the other of said base plate and said second surface of said turnable ring, whereby when said movable scroll revolves, said first and second elements move within said first and second recesses to prevent rotation of said movable scroll and said turnable ring; and

a plurality of projections provided on said first and second surfaces of said turnable ring to transmit said compression reaction force of said compressed gas, said projections protruding toward said pressure receiving member and said base plate and having projective engagement surfaces to engage said pressure receiving member and said base plate.

5,462,419

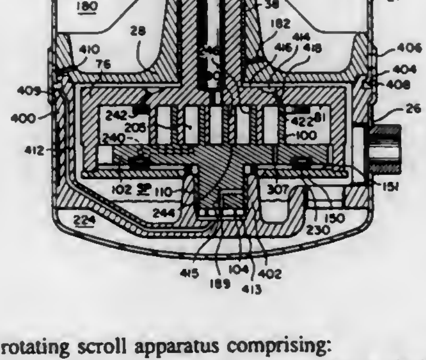
PRESSURE BIASED CO-ROTATIONAL SCROLL APPARATUS WITH ENHANCED LUBRICATION

Joe T. Hill, Whitehouse; John R. Williams, Tyler, and Robert E. Utter, Whitehouse, all of Tex., assignors to American Standard Inc., Piscataway, N.J.

Division of Ser. No. 125,684, Sep. 22, 1993. This application Sep. 1, 1994, Ser. No. 299,692

Int. Cl.^{6} F01C ***1/04;19/08;21/04***

U.S. Cl. 418—55.4 **36 Claims**



1. Co-rotating scroll apparatus comprising:

a shell having a suction pressure portion and a discharge pressure portion, said suction pressure portion defining a lubricant sump and said discharge pressure portion defining a lubricant sump;

a first bearing surface;

a second bearing surface;

a first scroll member having an end plate from which an involute wrap extends, said first scroll member being mounted for rotation in said first bearing surface;

a second scroll member having an end plate from which an involute wrap extends, said second scroll member being mounted for rotation in said second bearing surface, the wraps of said first and said second scroll members being interleaved;

means for causing the rotation of one of said scroll members;

means for drivingly coupling said first and said second scroll members for concurrent rotation;

means for lubricating said first bearing surface and said second bearing surface; and

means, including a pressure plate having a pressure responsive surface, for pressure biasing said second scroll member toward said first scroll member, said pressure plate defining an aperture, the edge of said aperture being chamfered so that lubricant impinging upon it is deflected onto said pressure responsive surface.

7. Co-rotating scroll apparatus comprising:

a shell having a suction pressure portion and a discharge pressure portion, said suction pressure portion defining a lubricant sump and said discharge pressure portion defining a lubricant sump;

a first bearing surface;

a second bearing surface;

a first scroll member having an end plate from which an involute wrap extends, said first scroll member being mounted for rotation in said first bearing surface;

a bearing housing, said second bearing surface being disposed in said bearing housing, said bearing housing integrally defining a lubricant passage in flow communication with said second bearing surface;

a second scroll member having an end plate from which an involute wrap extends, said second scroll member being mounted for rotation in said second bearing surface, the wraps of said first and said second scroll members being interleaved;

means for causing the rotation of one of said scroll members;

means for drivingly coupling said first and said second scroll member for rotation;

means for lubricating said first bearing surface; and

means for lubricating said second bearing surface, said means for lubricating said second bearing surface including a generally circumferential lubricant passage at least partially defined by said shell and said bearing housing, said circumferential lubricant passage being in flow communication with said sump in said discharge pressure portion of said shell and with said lubricant passage integrally defined by said bearing housing, said bearing housing having a surface which is in circumferential abutment with a surface of said shell, discharge pressure acting on said bearing housing to urge said surface of said bearing housing into sealing abutment with said surface of said shell so as to form a seal between said discharge pressure portion and said suction pressure portion of said shell.

5,462,420

GEAR PUMP

Roger Stehr, Buelach, and Urs Boelsterli, Bassersdorf, both of, Switzerland, assignors to Maag Pump Systems AG, Zurich, Switzerland

Filed Dec. 15, 1993, Ser. No. 167,079

Claims priority, application Switzerland, Dec. 16, 1992, 92 17 162.7 U

Int. Cl.^{6} F01C *19/00*

U.S. Cl. 418—83 **15 Claims**

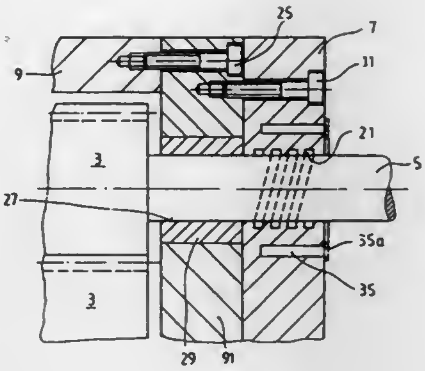
1. A gear pump comprising:

a housing for housing gear pump rotors,

at least one of said gear pump rotors comprising a shaft being led to the outside of said housing through a bore in said housing,

said bore comprising a shaft bearing section and a shaft sealing section arranged axially outwards of said bearing section with respect to a gear wheel of said at least one gear pump rotor,

said sealing section being arranged in an end cover plate of said housing and comprising a labyrinth seal with a labyrinth machined into material of said end cover plate.



5,462,421

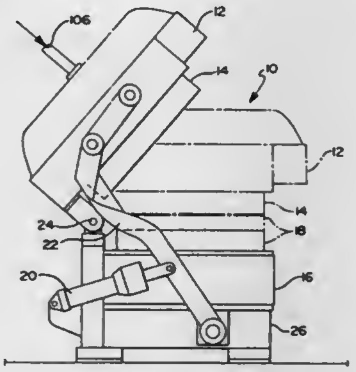
METHOD AND MOLD FOR FORMING A SHAPED LAMINATE

Arthur C. Stein, Grosse Ile, and John J. Reynolds, Howell, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 7, 1994, Ser. No. 192,881

Int. Cl.^{6} B29C *44/12*

U.S. Cl. 425—4 R **9 Claims**



1. Mold apparatus for forming a shaped laminate which comprises a cover layer and a foam backing layer formed in the apparatus and having a reinforcing substrate, said apparatus comprising

upper and lower mold members which open and close to define a mold cavity,

peripheral seals carried by both of the mold members for sealing the cavity when the mold members are closed,

means mounted on the mold for introducing foamable materials into the mold cavity,

trim blades carried by one mold member inwardly of the cavity adjacent the seal, the trim blades being sequentially movable from a retracted position adjacent the cavity, to an intermediate position within the cavity adjacent the other mold member for confining the foamable materials, to an extended position engaging the other mold member to sever the cover layer and substrate to define the finished shape of the laminate, and back to the retracted position, and

power means for opening and closing the mold members and for moving the trim blades through said sequence of positions.

5,462,422

APPARATUS FOR THE MANUFACTURE OF A PLASTIC MOLDED PART

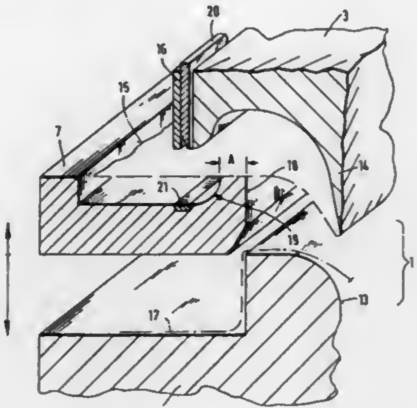
Andreas Güstävel, Ratingen; Ralf Horstkötter, Balve; Rolf Schlenz, Belbert, and Harald Strunk, Plettenberg, all of, Germany, assignors to Gebr. Happich GmbH, Germany

Division of Ser. No. 769,107, Sep. 30, 1991, Pat. No. 5,326,523. This application Feb. 28, 1994, Ser. No. 202,834

Claims priority, application Germany, Jan. 1, 1990, 40 30 964.9

Int. Cl.⁶ B29C *45/14;45/18;45/46*

U.S. Cl. 425—129.1 **15 Claims**



1. Apparatus for molding a plasticized plastic composition comprising

- a mold comprising a lower mold half and an upper mold half above the lower mold half, the mold halves being shaped to define a mold cavity between the mold halves, the upper and lower mold halves being moveable toward each other to mold plastic composition between the mold halves and away from each other to open the mold cavity;
- a plastic processing machine including a plasticizing device; means for feeding plasticized plastic composition from the plasticizing device into the open mold cavity;
- a two part clamping frame outside the mold cavity for resiliently holding a web of decorative material that is arranged between the mold halves and inside the mold cavity;
- a first part of the clamping frame having an immersion edge; a cutting plane spaced from the immersion edge and defining an edge of the closed mold cavity; a section of the first part between the immersion edge and the cutting plane for extending the mold cavity outwardly to the edge defined by the cutting plane when the mold halves are closed together and for expelling a finished molding from the cavity when the mold halves are moved away from each other to open the mold cavity.

5,462,423

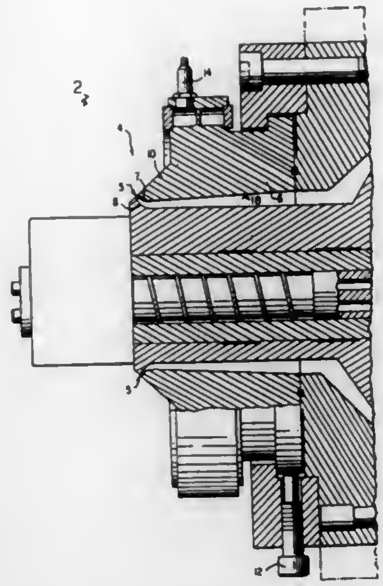
APPARATUS FOR NON-MECHANICAL DIE LIP TEMPERATURE ADJUSTMENT IN AN EXTRUDER

Robert W. Beckwith, Cummaquid, Mass., assignor to Sencorp Systems, Inc., Hyannis, Mass.

Filed Apr. 13, 1993, Ser. No. 45,477

Int. Cl ⁶ B29C *47/20*

U.S. Cl. 425—141 **8 Claims**



1. An extruder apparatus for extruding thermoplastic material, which apparatus comprises:

- a) an extruder housing having an inlet and an outlet and a bore therebetween for the passage of thermoplastic material from the inlet to the outlet through the bore;
- b) an extrusion die means adjacent the outlet and comprising an inner die lip and an outer die lip, which form a concentric die gap therebetween for the extrusion of thermoplastic material therethrough of selected wall thickness, the die gap in thermoplastic flow communication with the said bore; and
- c) the outer die lip having a heat transfer oil therein and having an inner circumferential surface about and in a heat-conductive relationship with the thermoplastic material to be extruded, the outer die lip having:
  - i) annular first and second oil flow channels for the circulation of heat transfer oil;
  - ii) an oil inlet for introduction into the first channel and the circulation of heat transfer oil therein of a selected temperature;
  - iii) an oil outlet for the withdrawal of circulated oil from the second channel for reheating or cooling;
  - iv) a plurality of separate circumferential sectors in the outer die lip each having a circulating oil passageway therein adjacent and parallel to the inner surface, and the length substantially of the inner surface; and
  - v) each sector having an inlet oil passageway from the first channel to the circulating oil passageway and an outlet oil passageway from the circulating oil passageway to the second channel; and a valve control means in the oil inlet passageway to control the flow of oil into the circulating oil passageway of each sector, whereby heat transfer oil of selected temperature is circulated through the plurality of sectors at a controlled flow rate for each sector to adjust and control the flow rate of the thermoplastic material passing through the gap and the resulting wall thickness of the extruded thermoplastic material.

5,462,424

METALLIC DIE DEVICE FOR PRESS MACHINE

Kazuo Kuroyone, Yamato, Japan, assignor to Anritsu Corporation, Tokyo, Japan

Division of Ser. No. 52,592, Apr. 23, 1993. This application Jan. 31, 1995, Ser. No. 381,430

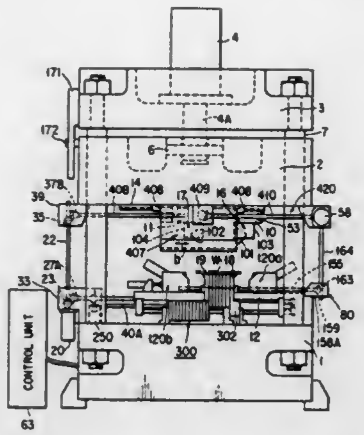
Claims priority, application Japan, Apr. 24, 1992, 4-106916; Apr. 24, 1992, 4-106917; Apr. 27, 1992, 4-107953; May 27, 1992, 4-134759

Int. Cl.⁶ B30B *3/00*

U.S. Cl. 425—150 **9 Claims**

1. A metallic die device for a press machine, in which upper and lower metallic dies for bending a flat workpiece are assembled in a press machine, each of said upper and lower metallic dies is divided, and at least a pair of divided upper and lower metallic dies are movably positionable, said die device comprising:

- upper metallic die bases having pivot axes for pivoting said divided upper metallic dies;



reference surfaces, formed on said upper metallic die bases, for holding said upper metallic dies in a reference state;

a press member for pressing said upper metallic dies against said reference surfaces and which is retracted upon application of a large force thereon;

metallic backup members, spaced apart from said divided lower metallic dies, for guiding said upper metallic dies when said upper metallic dies are moved downward;

lower bases having pivot centers for changing angles of guide surfaces of said metal backup members;

driving means for determining the angles of said guide surfaces of said metal backup members;

a coupling member for transmitting movement of said driving means to said metal backup members; and

a control unit for supplying a command representing a moving amount to said driving means.

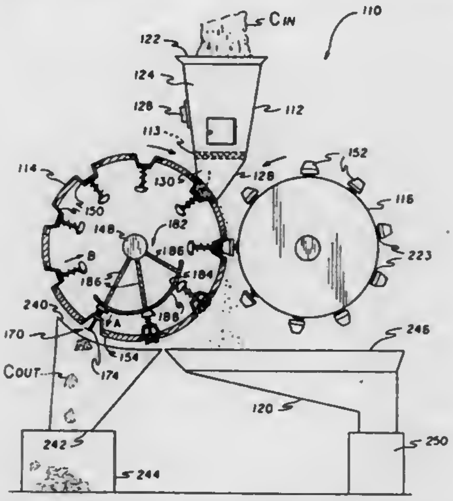
5,462,425
APPARATUS FOR DEMOISTURIZING COAL

Thomas Kuss, 2382 Watergap Rd., and Donald L. Horn, P.O. Box 696, both of Prestonsburg, Ky. 41653

Filed Jul. 11, 1994, Ser. No. 272,833

Int. Cl.^{6} B29C *43/08;* B30B *9/20;11/22;15/02*

U.S. Cl. 425—183 **22 Claims**



17. An apparatus for separating liquid and solid matter, the apparatus comprising:

a pair of contra-rotatable rollers including a first roller and a second roller, said first roller being provided with a plurality of female dies and said second roller being provided with a plurality of male dies, said first roller defining a cavity, each one of said female dies being matingly engageable with a corresponding one of said male dies, at least one of said female dies including a rear end having an opening therein, said first roller further comprises an ejection mechanism including:

at least one pusher assembly having a main body and a biasing element, said main body including a head and a rod connected to said head, said biasing element being carried by said rod, wherein said rod extends through said opening in said rear end of said at least on of said female dies and into said interior cavity of said first roller and said head is displaced within said at least one of said female dies, and

an actuation assembly including an actuating assembly rod and an arcuate shaped sled connected to said actuating assembly rod, said actuating assembly rod being fixed relative to rotation of said first roller, wherein

said actuation assembly is arranged and configured to intermittently contact and displace said pusher assembly upon rotation of said first roller;

a prime mover;

a power transmitting element connected to said prime mover and to said pair of rollers;

a hopper having a discharge end positioned adjacent said first roller;

a solid matter collector positioned adjacent said first roller; and

a liquid collector positioned adjacent said pair of rollers.

5,462,426
EXTRUDER

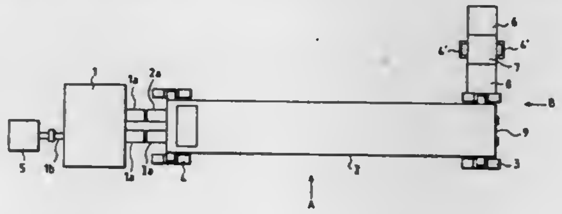
Yukio Imamura, Hiroshima, Japan, assignor to The Japan Steel Works, Ltd., Tokyo, Japan

Filed Sep. 28, 1994, Ser. No. 313,776

Claims priority, application Japan, Sep. 29, 1993, 5-242598

Int. Cl.^{6} B29B *7/38;7/74*

U.S. Cl. 425—190 **4 Claims**



1. An extruder comprising:

a speed reducer;

a cylinder having built-in screws coupled to the speed reducer, the screws driven by the speed reducer, a downstream end portion of cylinder secured, an upstream portion slidably connected in a direction of a flow passage of the cylinder; and

a gear pump coupled to the cylinder at end portion of the cylinder in such a manner that a direction of a flow passage of the gear pump is set perpendicular to the flow passage of the cylinder.

5,462,427
ROTARY TABLET PRESS

Hans Kramer, Köln, Germany, assignor to Kilian & Co. GmbH, Cologne, Germany

Filed Apr. 22, 1994, Ser. No. 231,070

Claims priority, application Germany, May 5, 1993, 9306785 U

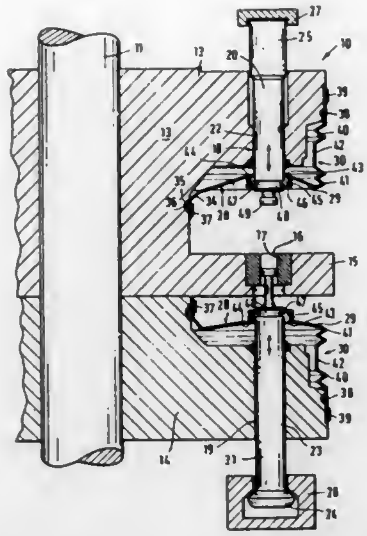
Int. Cl.^{6} B30B *11/08*

U.S. Cl. 425—231 **8 Claims**

1. A rotary tablet press comprising:

a rotatable table with means for carrying a plurality of moulds;

a plurality of pairs of upper and lower rams co-axially supported by said rotatable table, each said pair of upper and lower rams being arranged to be movable relative to one of said plurality of moulds to press material within said one mould;



a first flexible wall member being secured between said rotatable table and each upper ram of said plurality of pairs of upper and lower rams and a second flexible wall member being secured between said rotatable table and each lower ram of said plurality of pairs of upper and lower rams so as to form an airtight seal between a shank portion of each said ram and said mould carrying means; and

wherein said airtight seal is formed by an elastic sleeve surrounding said shank portion of each ram and connecting said ram to its respective flexible member.

5,462,428

INJECTION MOLDING MACHINE

Susumu Ito, and Kunio Kojima, both of Oshino, Japan, assignors to Fanuc Ltd., Minamitsuru, Japan

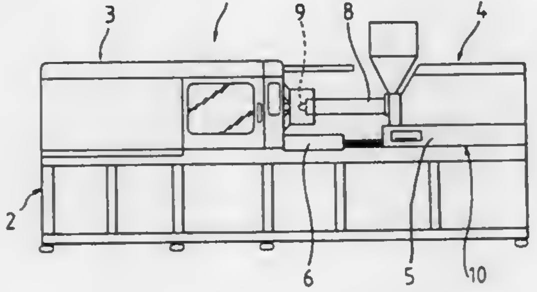
PCT No. PCT/JP93/00349, § 371 Date Dec. 2, 1993, § 102(e) Date Dec. 2, 1993, PCT Pub. No. WO93/19922, PCT Pub. Date Oct. 14, 1993

PCT Filed Mar. 24, 1993, Ser. No. 157,053

Claims priority, application Japan, Apr. 7, 1992, 4-113165

Int. Cl.⁶ B29C *45/07*

U.S. Cl. 425—567 **6 Claims**



1. An injection molding machine comprising:

a mold clamping unit; and

an injection unit facing each other on a base,

wherein the injection unit is mounted on a unit carriage capable of being moved in the longitudinal direction on the base by a nozzle touching mechanism,

wherein the unit carriage includes a front supporting portion and a rear supporting portion connected to each other through longitudinal ends of a connecting pipe,

wherein said unit carriage includes a longitudinal through passage penetrating the longitudinal axis of said carriage unit substantially in alignment with the longitudinal axis of the connecting pipe, and

wherein said carriage unit is fitted with a ball bearing nut of the nozzle touching mechanism and a longitudinal ball bearing screw mating with the nut in a threaded manner so that the respective axes of the nut and the screw are substantially in alignment with the longitudinal axis of a through hole, a flange of the ball bearing nut being formed to have a diameter smaller than that of the connecting pipe whereby the screw and ball bearing nut can be drawn out from behind the unit carriage through the connecting pipe.

5,462,429

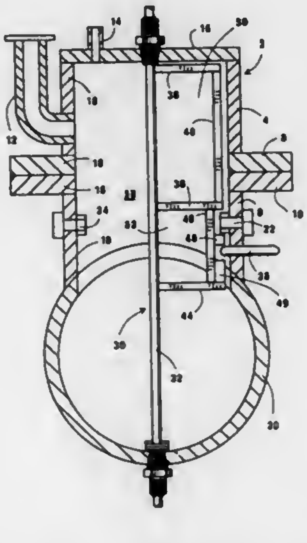
MECHANICAL WIPER FOR WASTE GAS INCINERATOR

Francis E. Pritchard, Buffalo, N.Y.; Eugene H. Koederitz, Westfield, N.J.; Ronald E. Fuhrhop, Orchard Park, N.Y., and Thomas H. Barker, Jr., Kingman, Ariz., assignors to Praxair Technology, Inc., Danbury, Conn.

Filed Oct. 20, 1993, Ser. No. 138,284

Int. Cl.⁶ F23J *1/06;* F23D *17/00*

U.S. Cl. 431—3 **15 Claims**



1. A waste gas incinerator comprising a combustion chamber having an inner wall; first means for injecting a combustible fuel into the chamber; second means for injecting at least one waste gas into the chamber to be burned; ignitor means for igniting the combustible fuel; and a mechanical wiper disposed within the chamber and adapted to move adjacent at least a portion of the inner wall so that buildup of products of combustion or reaction adhering to the inner wall will be mechanically removed by the wiper and wherein the first means comprises at least one ignitor port at least partially protruded from the inner wall of the chamber and the mechanical wiper is adapted to move adjacent the protruded ignitor port so that buildup of products of combustion or reaction adhering to the protruded ignitor port can be mechanically removed by the wiper.

10. A method of burning waste gases comprising the steps:

(a) feeding into a reaction zone of an enclosed incinerator having an inner wall with at least one protruded ignitor port and at least one protruded thermocouple, a combustible fuel and an oxygen-containing component, and at least one waste gas and then igniting said combustible fuel to burn said waste gas;

(b) removing the burnt gas from the incinerator; and

(c) wiping an area adjacent at least a portion of the inner wall of the incinerator containing the protruded ignitor port and protruded thermocouple with a moveable internally secured wiper so as to remove buildup of combustion or reaction products adhering to the upstanding wall.

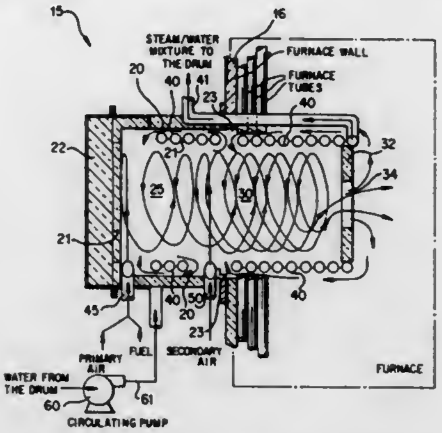
5,462,430
PROCESS AND APPARATUS FOR CYCLONIC COMBUSTION

Mark J. Khinkis, Morton Grove, Ill., assignor to Institute of Gas Technology, Des Plaines, Ill.

Continuation-in-part of Ser. No. 704,817, May 23, 1991, abandoned. This application Jan. 29, 1993, Ser. No. 11,670

Int. Cl.^{6} F23M *3/14;* **F23C** *9/06*

U.S. Cl. 431—10 **22 Claims**



1. An apparatus for cyclonic combustion comprising:
at least one combustion chamber side wall secured to a combustion chamber front wall defining a primary combustion zone and a secondary combustion zone and comprising means for cooling at least a portion of said primary combustion zone and said secondary combustion zone;
a primary orifice wall having a primary orifice secured to said combustion chamber side wall, said primary orifice disposed between said primary combustion zone and said secondary combustion zone and comprising means for cooling said primary orifice wall;
a secondary orifice wall having a secondary orifice secured to said combustion chamber side wall at a discharge end of said secondary combustion zone;
primary tangential injection means for tangentially injecting fuel and primary combustion air into said primary combustion zone, said primary tangential injection means comprising at least one primary nozzle secured to said combustion chamber side wall and in communication with said primary combustion zone; and
secondary tangential injection means for tangentially injecting secondary combustion air into said secondary combustion zone.

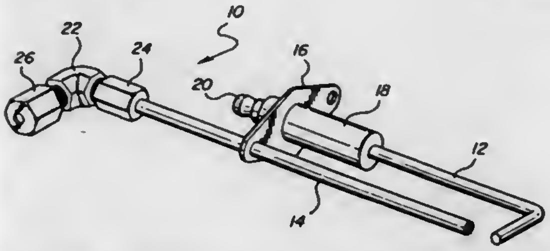
5,462,431
IGNITOR WITH METERING ORIFICE INSERT

Farshid Ahmady, Rochester Hills, Mich., assignor to Solaronics, Rochester, Mich.

Filed Apr. 11, 1994, Ser. No. 225,704

Int. Cl.^{6} F23Q *7/22*

U.S. Cl. 431—43 **6 Claims**



1. For use in combination with a fuel gas ignitor of the type having a hollow tubular first electrode connectable to a fuel gas supply line and a solid second electrode disposed in spaced relationship with the first electrode to ignite fuel gas supplied to a gas enriched area between said electrodes;
a coupling for attaching said first electrode to said supply line comprising a solid body having first and second opposite and externally threaded end portions, a bore extending through said body and between said end portions, a length of bore adjacent one said end portion being internally threaded; and
a first and a second fuel gas metering insert, each having external threads for engagement with the internal threads of said length and alternatively insertable therein, said first insert having a through bore forming a metering orifice sized to supply a predetermined amount of a first type of fuel gas to said first electrode when inserted in said coupling bore and said second insert having a through bore forming a metering orifice sized to supply a predetermined amount of a second type of fuel gas to said first electrode when inserted in said coupling bore, said inserts further having means formed therein for facilitating insertion and removal thereof relative to said coupling body;
whereby said fuel gas ignitor is modifiable to function properly when supplied with either said first or said second type of fuel gas by the alternative insertion in said coupling of said first or said second insert respectively.

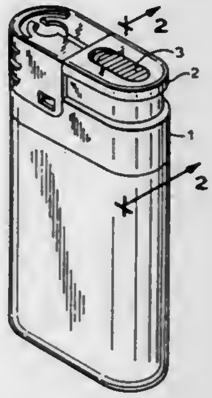
5,462,432
GAS LIGHTER WITH IGNITION SAFETY DEVICE

Jin K. Kim, c/o Bultina America Corp. 2334 E. Valencia Dr., Fullerton, Calif. 92631

Filed Jun. 17, 1994, Ser. No. 261,801

Int. Cl.^{6} F23D *11/36*

U.S. Cl. 431—153 **7 Claims**



1. A gas lighter with a safety device to prevent ignition of the lighter, the gas lighter comprising:
a housing and ignition means in the housing, the ignition means being actuable for igniting the lighter, and the housing including a wall defining a space at an upper end of the lighter;
a first projection provided in the space at a location spaced away from the wall; an ignition button at the upper end of the lighter, the ignition button being located relative to the space for movement to an operative position for actuating the ignition means to ignite the lighter; and
a safety button provided at the upper end of the lighter and structured and arranged to be movable relative to the ignition button from a first position to a second position, the safety button having a second projection extending toward the first projection in the space at the upper end of the lighter,
wherein in the first position of the safety button the second projection contacts the first projection to prevent movement of the ignition button to the operative position, and in the second position of the safety button the second projection does not contact the first projection so that the ignition button is movable to the operative position.

5,462,433
DEVICE FOR BLOWING PREHEATED AIR INTO A SHAFT FURNACE

Jean Benck, Dudelange, and Pierre Mailliet, Redange/Attert, both of, Luxembourg, assignors to Paul Wurth S.A., Luxembourg

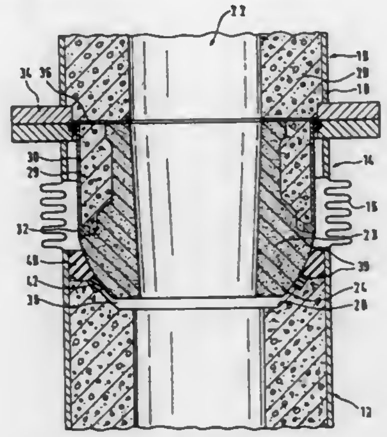
Filed Mar. 14, 1994, Ser. No. 212,229

Claims priority, application Luxembourg, Mar. 31, 1993, 88241

The portion of the term of this patent subsequent to May 11, 2010, has been disclaimed.

Int. Cl.^{6} F27D *1/08*

U.S. Cl. 432—99 **9 Claims**



1. A device for blowing preheated air into a shaft furnace, comprising a first and second tubular element, each fitted with an outer shielding made of refractory steel and with an inner refractory lining made of cast refractory concrete, the first and second tubular elements being connected by a ball joint and a compensator, and the ball joint including:

- a convex pivot which is integral with the first tubular element and which can pivot in a concave dish integral with the second tubular element, wherein at least the convex pivot of the ball joint comprises a profiled refractory brick anchored in the inner refractory lining made of cast refractory concrete.

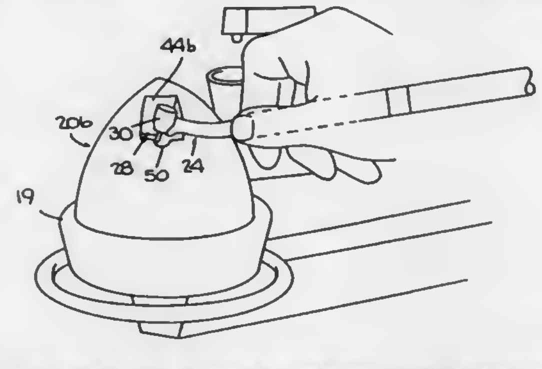
5,462,434
DENTAL HAND TOOL CLEARING SHIELD

Michael J. Mahr, Bedford, N.Y., assignor to Henry Schein, Inc., Port Washington, N.Y.

Filed Oct. 6, 1993, Ser. No. 132,378

Int. Cl.^{6} A61C *17/06;17/14;1/16*

U.S. Cl. 433—97 **25 Claims**



1. A shield for use with a dental hand tool, comprising an enclosure of generally hollow semi-spherical or paraboloidal shape sized to receive therein an end of the hand tool from which matter may be ejected during operation of the hand tool, said enclosure having a first opening through which the end of the hand tool may be inserted into and removed from said enclosure, a second opening through which matter ejected from the end of the hand tool may be removed from said enclosure, said second opening being exposed and being circular whereby said enclosure may be supported in a substantially fluid-tight and removable manner in a cuspidor having a circular open end such that any matter ejected from the end of the hand tool is transported away from said shield through said second opening into the cuspidor while substantially preventing escape of the matter ejected from the end of the hand tool except through said second opening into the cuspidor.

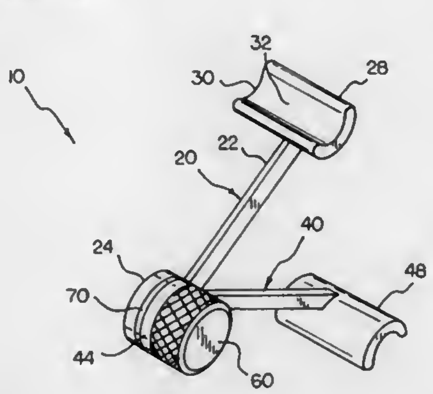
5,462,435
ADJUSTABLE MOUTH PROP

James P. Young, 1527 Jacqueline Dr., Holt, Mich. 48842

Filed Feb. 22, 1994, Ser. No. 199,710

Int. Cl.^{6} A61C *5/00*

U.S. Cl. 433—140 **8 Claims**



1. A new and improved adjustable mouth prop for holding a dental patient's mouth open during performance of a dental procedure in a manner which is safe and comfortable for the patient and convenient for the dentist, the adjustable mouth prop comprising:

- a threaded shaft formed of rigid material suitable for sterilization, the shaft having an enlarged head formed on one end thereof;
- an upper arm formed of rigid material suitable for sterilization, the upper arm mounted on the threaded shaft, the upper arm projecting upwardly outwardly perpendicularly from the threaded shaft, the distal end of the upper arm having an integral elongated upwardly opening concave upper jaw support member extending laterally thereacross, the upper jaw support member being engagable with the patient's upper teeth such that the teeth are removedly retained within the cavity irrespective of the elevational angle of the arm, the proximal end of the upper arm having an integral discus bearing surface formed radially thereon, the center of the bearing surface having a lateral hole therethrough whereby the arm is mounted on the threaded shaft;
- a lower arm formed of rigid material suitable for sterilization, the lower arm pivotally mounted on the threaded shaft, the lower arm projecting downwardly outwardly perpendicularly from the threaded shaft, the distal end of the lower arm having an integral elongated downwardly opening concave lower jaw support member extending laterally thereacross, the lower jaw support member being engagable with the patient's lower teeth such that the teeth are removedly retained within the cavity irrespective of the declinational angle of the arm, the proximal end of the lower arm having an integral discus bearing surface formed radially thereon, the center of the bearing surface having a lateral hole therethrough whereby the arm is mounted on the threaded shaft;
- a lock washer formed of rigid material suitable for sterilization, the lock washer being disposed on the threaded shaft between the bearing surfaces of the arms, the lock washer also being in cooperative relationship with the bearing surfaces such that the arms may be locked angularly with respect to each other when the proximal ends of the arms are biased toward each

other to bring the bearing surfaces into touching facing contact with the lock washer, the lock washer also being in cooperative relationship with the bearing surfaces such that the arms may pivot freely with respect to each other when the proximal ends of the arms are unbiased to position the bearing surfaces in spaced facing relationship with the lock washer; and

a knurled thumbnut formed of rigid material suitable for sterilization, the thumbnut threadedly engaging the free end of the threaded shaft such that rotating the nut in one direction biases the proximal ends of the upper and lower arms together into contact with the lock washer, and rotating the nut in the opposite direction releases the bias.

5,462,436

METHOD AND MEANS FOR AFFIXING A COMPONENT TO A DENTAL IMPLANT

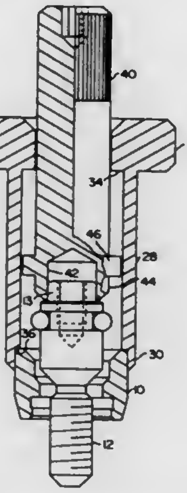
Keith D. Beaty, West Palm Beach, Fla., assignor to Implant Innovations, Inc., West Palm Beach, Fla.

Continuation-in-part of Ser. No. 16,538, Feb. 11, 1993, Pat. No. 5,322,443. This application Mar. 8, 1994, Ser. No. 207,187

The portion of the term of this patent subsequent to Jun. 21, 2011, has been disclaimed.

Int. Cl.^{6} A61C *3/00*

U.S. Cl. 433—141 **25 Claims**



1. A tool for affixing a component to a support having a receiver member adapted to receive an elongated attaching member for affixing said component, said tool comprising a first part for grasping said component around the periphery of one end thereof with the second end of said component extendinq beyond said first part, and an elongated second part-including at one end of said second pad means for drivingly engaging said attaching member at a first end of said attaching member and manipulating means at the other end of said second part, and means to fix said first ana second parts in a substantially coaxial relation with said second part rotatable within said first part such that said first part can be manipulated to bring said second end of said component to abut said support without said first part touching said support while holding said component around said periphery of said one end thereof, with said second part having its manipulating means exposed and available to manipulate said attaching member to cooperate with said receiver member to affix said component to said support while holding said attaching member engaged endwise with said second part and via said manipulating means rotating said second part relative to said first part.

5,462,437

DENTAL ALLOYS FOR COMPOSITE AND PORCELAIN OVERLAYS

Arun Prasad, Cheshire, and Martin Schulman, Orange, both of Conn., assignors to Jeneric/Pentron Incorporated, Wallingford, Conn.

Filed Nov. 10, 1993, Ser. No. 149,960

The portion of the term of this patent subsequent to Jun. 13, 2012, has been disclaimed.

Int. Cl.^{6} A61C *13/08*

U.S. Cl. 433—207 **19 Claims**

1. A dental alloy which can be coated with a composite or a porcelain composition to form a dental restoration, said alloy comprising:

(A) between one and 60 percent by weight gold;
(A1) between 23.4 and 24.9 percent by weight silver;
(B) up to 41.6 percent by weight thermal expansion adjuster comprising at least one member selected from the group consisting of platinum and palladium;
(C) between 0.25 and 34 percent by weight strengthener and oxide former comprising at least one member selected from the group consisting of tin and indium;
(D) up to about three percent by weight grain refiner comprising at least one member selected from the group consisting of iridium, ruthenium, rhenium, cobalt and rhodium; and
(E) up to about 0.25 percent by weight deoxidizer comprising at least one member selected from the group consisting of calcium, boron, silicon, aluminum, lithium and phosphorus,

said alloy having a yellow color, a melting range of between 870° C. and 1230° C., and a coefficient of thermal expansion between 15.5×10^{-6} and 17.5×10^{-6} in/in/° C. when heated from room temperature to 500° C.

5,462,438

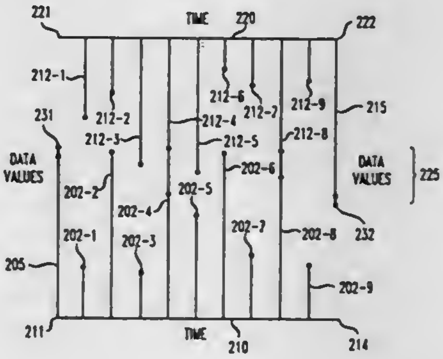
METHOD OF DISPLAYING MULTIPLE TIME SERIES AND DISPLAY GENERATED THEREBY

Richard A. Becker, Warren; Linda A. Clark, Mountainside, and Diane Lambert, Berkeley Heights, all of N.J., assignors to AT&T IPM Corp., Coral Gables, Fla.

Filed Dec. 10, 1993, Ser. No. 165,427

Int. Cl.^{6} G09B *29/00*

U.S. Cl. 434—430 **14 Claims**



8. A method of displaying sets of data, said method comprising the steps of:

displaying a first set of data on a first coordinate system, wherein said first coordinate system comprises a left vertical axis and a first horizontal axis originating at said left vertical axis and extending to the right to a first endpoint, wherein said first coordinate system is scaled with values to accommodate values in said first set of data and wherein said left vertical axis is scaled from bottom to top, and

displaying a second set of data on a second coordinate system, wherein said second coordinate system comprises a right vertical axis and a second horizontal axis, said second horizontal axis having a second endpoint, said second horizontal axis originating at said second endpoint extending to the right to said right axis, wherein said second coordinate system is scaled with values to accommodate values in said second set of data, wherein said right vertical axis is scaled from top to bottom and wherein said second horizontal axis is scaled such that values increase in the same direction as values for said first horizontal axis, said second coordinate system being positioned relative to said first coordinate system such that said right vertical axis is parallel to and to the right of said left vertical axis and above said first horizontal axis.

14. A display generated according to the method in claim 8.

5,462,439

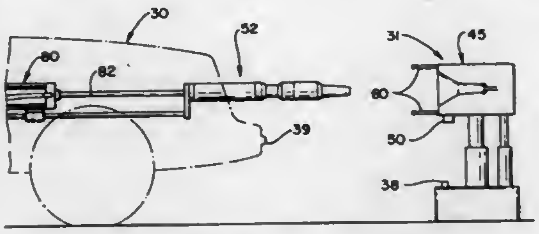
CHARGING BATTERIES OF ELECTRIC VEHICLES

Arlie L. Keith, Rte. 2, Box 93b, Laurel Springs, N.C. 28644

Filed Apr. 19, 1993, Ser. No. 49,053

Int. Cl.⁶ H02J *7/00*

U.S. Cl. 439—34 **57 Claims**



1. A system for charging the batteries of electric vehicles, comprising:

a charge station to which a vehicle may be presented to receive an electric charge, said charge station including a source of charging voltage and a first pair of electric contacts; and

a vehicle charging system disposed on an electric vehicle that has a battery for supplying motive energy to the vehicle, said vehicle charging system including charge control circuits and a second pair of electric contacts disposed to connect respectively with said first pair of electric contacts when said vehicle is presented to said station for a charge;

one of said pairs of contacts being disposed on a probe and the other of said pairs of contacts being disposed within a receptacle in a manner to connect with the contacts of said probe when said probe is inserted in said receptacle;

wherein the improvement comprises:

said probe having an elongated central conductor, the distal end of which comprises one of said probe contacts;

a non-conducting shroud slidable along said central conductor between a proximal position in which the distal end of said central conductor is exposed and a distal position in which said shroud surrounds said central conductor; and

means for resiliently urging said shroud toward said distal position;

one of said probe contacts being disposed on said shroud in a position to press against and connect with a related contact on said receptacle, force exerted by said related contact on said shroud contact urging said shroud toward said proximal position to thereby expose said central conductor so that it may connect with the other contact of said receptacle.

5,462,440

MICRO-POWER CONNECTOR

Richard E. Rothenberger, 5 State Dr., Harrisburg, Pa. 17112

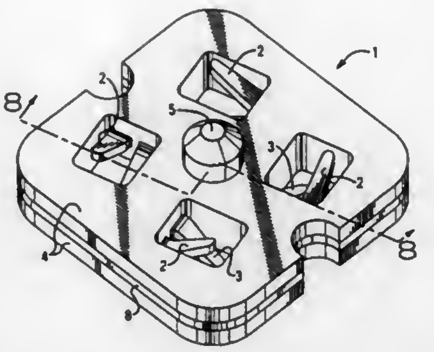
Filed Mar. 11, 1994, Ser. No. 212,635

Int. Cl.⁶ H01R *9/09*

U.S. Cl. 439—66 **7 Claims**

1. A contact connector array comprising:

an array formed of a conductive material and having conductive members which are joined together;



the members are diagonally spaced relative to each other, each member of the array is located in a respective quadrant of said array, and each member of the array includes a pair of deflectable contact points for being deflected in opposite directions relative to each other;

and said contact connector array comprises a monolithic block of dielectric, said array of conductive material and conductive members are at least partially integrally molded in said monolithic block.

5,462,441

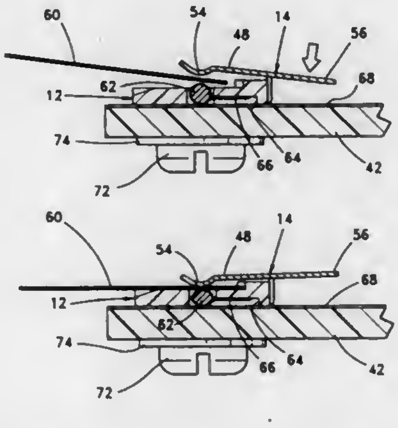
LOW PROFILE ELECTRICAL CONNECTOR

Robert M. Renn, 1901 Turfwood Dr., Pfafftown, N.C. 27040, and Keith L. Volz, 601 O'Neill Dr., Jamestown, N.C. 27282

Filed May 27, 1994, Ser. No. 250,268

Int. Cl.⁶ H01R *9/09*

U.S. Cl. 439—67 **8 Claims**



1. A low profile electrical connector for mounting a flexible film having circuitry thereon for electrical interconnection to a planar electronic device upon which said connector is to be mounted, said connector comprising

(a) an elongated dielectric housing, defined by essentially upper and lower parallel surfaces, a central through slot extending between said upper and lower surfaces and end portions for receiving an electrical interface member, means for mounting said housing to said planar electronic device, and means along one of said surfaces for receiving a spring actuator member,

(b) a spring actuator member comprising a stamped and formed metal member channel shaped at its ends to slidably receive said end portions of said dielectric housing, and a mid portion having an extension therefrom adapted to be deflected to effect opening or spreading of said end portions, and

(c) an elastomeric connector comprising an elastomeric core having a flexible film wrapped thereabout, where said film includes electrical circuitry thereon, said elastomeric connector positioned within said central through slot to electrically interconnect a flexible film disposed within said low profile connector to said planar electronic device.

5,462,442

MODULE FOR INFORMATION PROCESSING APPARATUS USING STACKED PRINTED CIRCUIT BOARDS AND CONNECTOR FOR STACKING PRINTED CIRCUIT BOARDS

Masaya Umemura, Fujisawa; Toshihiko Ogura; Hideki Osaka, both of Ebina, and Masatsugu Shinozaki, Hadano, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

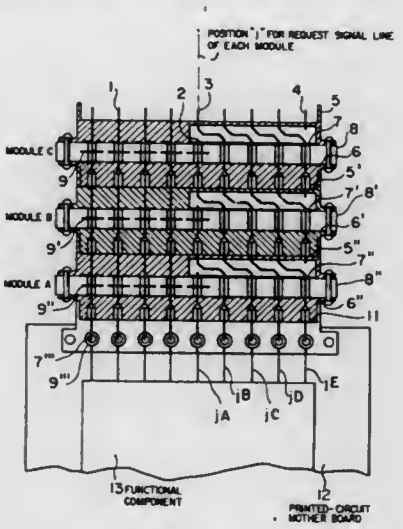
Filed Feb. 17, 1994, Ser. No. 197,841

Claims priority, application Japan, Feb. 24, 1993, 5-035617

Int. Cl.⁶ H05K *1/00*

U.S. Cl. 439—69 **10 Claims**

1. A connector for stacking printed circuit boards, comprising:



a plurality of contact conductors;

a first insulating block having first fixing positions for fixing respective ends of said plurality of contact conductors in a predetermined pattern;

a printed-circuit board mounted on said first insulating block, having through holes at positions corresponding to positions of said contact conductors as fixed by said first insulating block, said through holes having at least a portion of said plurality of contact conductors passed therethrough, first printed conductors electrically connected to a first group of said plurality of contact conductors, and second printed conductors terminating a second group of said plurality of contact conductors at predetermined positions;

a second insulating block mounted on another side of said printed-circuit board and having second fixing positions for fixing respective ends of said plurality of contact conductors in the same predetermined pattern as said first insulating block,

wherein said first group of said contact conductors is fixed at same said first fixing positions and said second fixing positions on said first and second insulating blocks, and a third group of said contact conductors is fixed on said second insulating block at said second fixing positions displaced by a predetermined pitch from said first fixing positions fixed by said first insulating block.

5,462,443

PLUG-TYPE CONNECTOR

Klaus Kurbjuhn, Bocholt, and Heinz-Dieter Mueller, Emmerich, both of, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

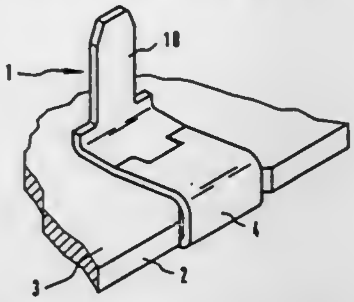
Continuation of Ser. No. 200,433, Feb. 23, 1994, abandoned. This application Feb. 13, 1995, Ser. No. 388,619

Claims priority, application Germany, Feb. 26, 1993, 9302836 U

Int. Cl.⁶ H01R *9/09*

U.S. Cl. 439—78 **9 Claims**

1. Plug-type connector for producing an electrical connection



between a flat module having contact pads or tracks and a further component part having electrical terminals, comprising:

a substantially U-shaped, resilient component part having colinear and coplanar legs spaced to fit over said contact pads or tracks disposed on an edge region of said flat module without penetrating said flat module;

each of said legs having hook-shaped, projecting securing portions directed toward one another to assure electrical and physical contact between said pads or tracks of said flat module and said U-shaped resilient component with said hook-shaped securing portions contacting opposite sides of said flat module; and

said U-shaped resilient component having means for mechanically and electrically contacting said further component part.

5,462,444

ELECTRICAL CONNECTOR HAVING BUS BARS PROVIDING CIRCUIT BOARD RETENTION

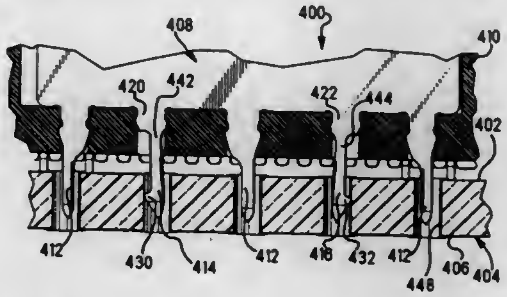
Iosif Korsunsky, Harrisburg; Tod M. Harlan, Mechanicsburg, and Joanne E. Shipe, Harrisburg, all of Pa., assignors to The Whitaker Corporation, Wilmington, Del.

Division of Ser. No. 145,018, Oct. 29, 1993, Pat. No. 5,411,404. This application Feb. 2, 1995, Ser. No. 382,545

Int. Cl.⁶ H01R *13/652;13/73*

U.S. Cl. 439—108 **2 Claims**

1. A board retention member for a connector of the type mountable to a circuit board, comprising:



a body section disposed and affixed within a dielectric housing and a pair of posts extending from the body section, respective beam sections extending beyond the mounting face of the housing to respective free ends adapted to be inserted into a respective through hole of a circuit board to be soldered therewithin, said posts each including a protuberance extending from a side edge of a respective said beam section proximate a respective said free end, with said protuberances extending outwardly in opposed directions away from each other,

each said protuberance extending from an edge of a respective said beam section to engage an adjacent side wall of said respective through hole and deflect said beam section toward an opposing side wall of said through hole with the thus-deflected beam section bearing against the engaged side wall under spring bias sufficient to provide mechanical retention of the connector to the circuit board at least until soldering, and

each said post includes a root joining said beam section to said body section having a cross-sectional area reduced from a general cross-sectional area of the remainder of said beam section between said root and said protuberance.

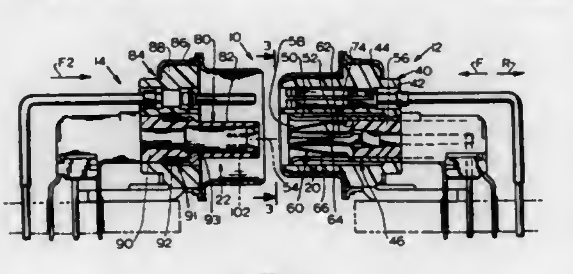
5,462,445
SWITCHING CONNECTOR

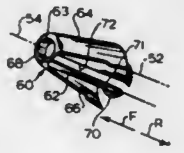
John W. Anhalt, Orange, Calif., assignor to ITT Corporation, New York, N.Y.

Filed Jun. 27, 1994, Ser. No. 265,882

Int. Cl.^{6} H01R *13/703*

U.S. Cl. 439—188 **11 Claims**





1. A connector assembly that includes first and second connectors each having a coax region that is mateable with a coax region of the other connector, wherein said first connector has a first housing with an open front end at a first of said coax regions, has electrically conductive coaxial outer and inner contacts mounted at said first coax region with front contact ends at said open front end, and has at least one deflectable conductor that is connected to a first of said coaxial contacts and which is biased to engage the other of said coaxial contacts but which is deflectable out of engagement with said other of said coaxial contacts, and said second connector has a second housing and has an actuator with an insulative tubular part that is mounted in said second housing and that is constructed to fit between said coaxial contacts and deflect said at least one deflectable conductor out of engagement with said other of said coaxial contacts when said connectors are mated, characterized by:

said coaxial inner contact is in the form of a pin, and including an electrically conductive switch element which includes a sleeve that fits around said pin and that also includes at least one switch arm that extends rearwardly and radially outwardly from said sleeve and that has a rear portion biased radially outwardly to engage said outer coaxial contact, said switch arm forming said deflectable conductor.

5,462,446
SOCKET APPARATUS

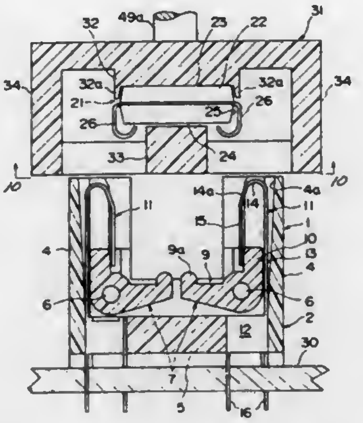
Kiyokazu Ikeya, Shizuoka, Japan, assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 20, 1994, Ser. No. 278,521

Claims priority, application Japan, Aug. 6, 1993, 5-215216

Int. Cl.^{6} H01R *13/62*

U.S. Cl. 439—264 **12 Claims**



1. Socket apparatus for mounting IC units having a plurality of leads comprising,

a body member having a center and having opposed sides, a plurality of contact elements mounted on at least one opposed side of the body member aligned with respective leads of an IC unit to be received therein, each contact element having a flexible, elongated contact portion having a first surface facing the center of the body member and a second opposite surface facing away from the center of the body member,

a lever means pivotably mounted in the body member and having a first arm disposed in alignment with each contact portion on a side of the contact portion facing the second, opposite surface, the lever means having a second arm with a distal end portion,

a movable head member movable between a first IC unit loading position and a second IC unit mounting position, the head member having an IC unit receiving seat, IC leads of an IC unit disposed on the IC unit receiving seat moving into engagement with the first surface of respective contact portions as the head member moves from the first position toward the second position applying a first contact force on the leads, the head member engaging the distal end portion of the second arm when the head member is proximate to the second IC mounting position so that continued movement of the head member to the second IC mounting position causes the lever means to pivot concomitantly moving the first arms against the second surface of respective contact portions and toward respective IC unit leads applying a second force on each IC unit lead for a total contact loading at the mounting position.

5,462,447
ELECTRICAL CONNECTOR HAVING AN INSERTION AND EXTRACTION BRACKET

Gérard Boiret, Yvre L'Eveque, and Thierry Quillet, Saint Pavace, both of, France, assignors to Framatome Connectors International, Courbevole, France

Filed May 10, 1994, Ser. No. 240,436

Claims priority, application France, May 10, 1993, 93 05579

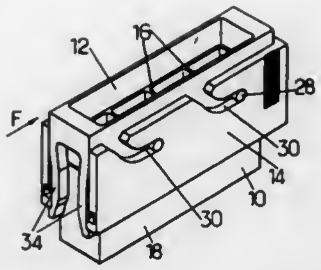
Int. Cl.^{6} H01R *4/50*

U.S. Cl. 439—347 **5 Claims**

1. An electrical connector comprising:

(a) a base member adapted to contain first electrical contacts and having two mutually parallel side walls;

(b) a plug member adapted to contain second contacts suitable for mating with said first contacts, said plug member being



displaceable parallel to side walls of said base member in an insertion and extraction direction and having outwardly projecting studs orthogonal to said direction and located in a zone which remains outside said base member in a fully-inserted position of said plug member in said base member; and

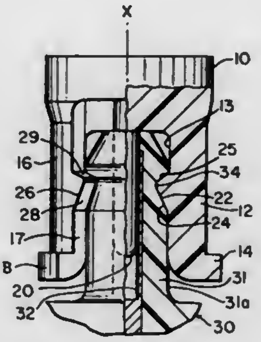
(c) a bracket for forcibly inserting and extracting said plug member into and out of said base member, said bracket having branches sized to be capable of sliding along said side walls along a first direction orthogonal to said insertion and extraction direction and along a second direction opposite to said first direction, said branches being formed with stud receiving passages of a shape such that displacement of said bracket in said first direction causes said studs to move farther into and along said passages from open ends thereof, and that displacement in said second direction expels said studs from said passages;

(d) said plug further including resilient latching tabs so located as to engage behind said bracket when the plug member is fully inserted, thereby resiliently retaining said plug member, said latching tabs comprising two end portions of said plug member, defining a fork which is incompletely separated from a middle portion of said plug member by slots cut parallel to said direction of insertion and extraction.

5,462,448

ELECTRICAL CONNECTOR LOCKING SYSTEM

Jeffrey T. Kida, Layton, and Alan D. Kendrick, Hooper, both of Utah, assignors to Morton International, Inc., Chicago, Ill.
Filed Sep. 8, 1994, Ser. No. 303,220
Int. Cl.^{6} H01R *13/627*
U.S. Cl. 439—357 **10 Claims**



1. An electrical connector locking system for coupling an initiator of an airbag assembly to an electrical connector that is connected to the circuitry of a vehicle containing the airbag assembly, the locking system comprising:

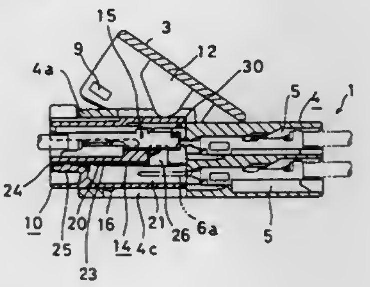
an initiator base having a pair of radially opposed legs extending axially in the same direction therefrom and having a plurality of male electrical terminals extending axially therethrough and being positioned between said legs, each of said legs having on a radially inward surface of said legs a radially inwardly protruding ramp element, each of said protruding ramp elements formed by two converging tapered surfaces tapered radially inwardly and converging together;

an electrical connector comprising a base and an insertion end joined by a projecting portion adapted to be received by the initiator base, a plurality of female electrical terminals housed in said projecting portion of said connector, said female terminals adapted to mate with the male electrical terminals extending from said initiator base, said electrical connector having, on a radially outward surface of said projecting portion, a pair of radially inwardly extending notches, each of said notches formed by two converging tapered surfaces tapered inwardly from said radially outward surface, each of said notches being substantially complementary in shape to the protruding ramp elements on the legs of said initiator base, each of said notches meshing with and engaging one of said protruding ramp elements on one of said legs of said initiator base for locking said connector on said initiator base, said projecting portion tapers radially inwardly from said notches toward the insertion end of the electrical connector to provide a radially inwardly tapered insertion surface.

5,462,449

ELECTRICAL CONNECTOR WITH A FUNCTION OF DETECTING INTERFITTING ENGAGEMENT OF CONNECTOR HOUSINGS

Takeshi Tsuji, and Masashi Saito, both of Yokkaichi, Japan, assignors to Sumitomo Wiring Systems, Ltd., Mie, Japan
Filed Nov. 23, 1994, Ser. No. 347,142
Claims priority, application Japan, Nov. 26, 1993, 5-321327
Int. Cl.^{6} H01R *13/62*
U.S. Cl. 439—188 **6 Claims**



1. An electrical connector comprising:

a) first and second connector housings fitted one into the other into interfitting engagement;

b) a plurality of pairs of terminals disposed in the respective connector housings and electrically connected together upon the interfitting engagement of the first and second connector housings;

c) a short-circuiting terminal usually urged so as to make a short circuit between at least two of the terminals disposed in the second connector housing;

d) an actuator displacing the short-circuiting terminal upon the interfitting engagement of the first and second connector housings so that the short-circuiting terminal is departed from said at least two terminals disposed in the second connector housing; and

e) a pair of interfitting engagement detecting terminals provided in the first connector housing so that short circuit is made therebetween by the short-circuiting terminal when the same has been displaced.

5,462,450
CONNECTOR DISCONNECTION SENSING MECHANISM

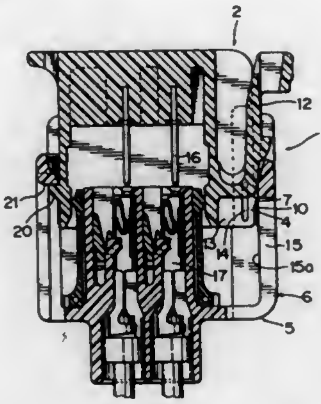
Shinji Kodama, Shizuoka, Japan, assignor to Yazaki Corporation, Tokyo, Japan

Continuation of Ser. No. 115,655, Sep. 3, 1993, abandoned. This application Jan. 19, 1995, Ser. No. 375,270

Claims priority, application Japan, Sep. 7, 1992, 4-062637 U; Mar. 8, 1993, 5-009445 U

Int. Cl.⁶ H01R *3/00*

U.S. Cl. 439—489 **5 Claims**



1. A connector having a disconnection sensing mechanism, the connector comprising:

two mateable connector halves each having a terminal, the two connector halves movable between a connected state so that the terminals form an electrical connection and a disconnected state so that the terminals are electrically disconnected;

one of the two mateable connection halves comprising a resilient disconnection sensing arm including a projection, and a lock arm adjacent to said disconnection sensing arm; and

a guide projection provided on the other of the two connector halves, said guide projection having an engagement face with a gentle slope and a falling face with a steep slope, the guide projection being provided so said projection of the resilient disconnection sensing arm first engages the engagement face and bends the resilient disconnection sensing arm when the two connector halves are moved from the connected state to the disconnected state, such that said projection of the resilient disconnection sensing arm is released at the falling face of the guide projection to produce a disconnection signal at the moment when the two connector halves reach the disconnected state,

wherein said resilient disconnection sensing arm is extends from a front end of one of the two mateable connector halves, and is separate from the lock arm.

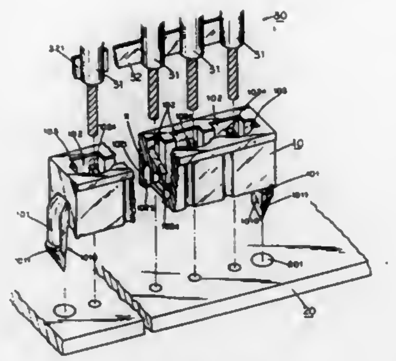
5,462,451
ELECTRICAL CONNECTOR

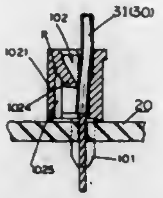
Te-Hsin Yeh, 42, Sunneili, Fuhsin Li, Chungli City, Taoyuan, Taiwan, Prov. of China

Filed Jun. 13, 1994, Ser. No. 259,688

Int. Cl.⁶ H01R *9/07*

U.S. Cl. 439—493 **1 Claim**





1. An improved electrical connector for electrical cables, comprising:

a longitudinally extended connector body, said connector body having a plurality of longitudinally spaced wire receiving openings formed therethrough and a plurality of first slotted openings disposed between respective pairs of said plurality of wire receiving openings for receiving connecting insulation web portions of an electrical cable therein, said connector body having a pair of second slotted openings formed on respective longitudinal ends of opposing endmost wire receiving openings for receiving untrimmed portions of insulation webbing disposed on opposing longitudinal ends of the electrical cable, each of said wire receiving openings being an inner wall extending between opposing upper and lower ends of said wire receiving openings;

a plurality of tab members, each of said tab members extending angularly from an upper end of said inner wall of a respective wire receiving opening for engaging insulation portions surrounding a conductive wire of an electrical cable, each of said plurality of tab members having a sharp pointed lower end to resist withdrawal of the cable and a lower surface angularly extending to a radiused interface with said inner wall for increasing an engagement force of said tab member; and,

a pair of transversely directed positioning legs, each of said pair of positioning legs being disposed on an opposing longitudinal end of said connector body, each of said pair of positioning legs having an inner surface facing said connector body and an opposing outer surface, said inner surface being outwardly inclined toward a distal end of said position leg, each of said positioning legs having a circuit board engaging barb formed on said outer surface adjacent said distal end, said barb having a planar upper surface extending substantially orthogonal said transverse direction for contiguous contact with a circuit board surface.

5,462,452
BREAKAWAY EXTENSION CORD FOR PREVENTING ELECTRICAL PLUG DAMAGE

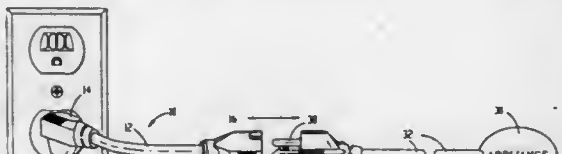
Michael J. Devine, 9328 Kessler La., Overland Park, Kans. 66212

Division of Ser. No. 233,224, Apr. 26, 1994, Pat. No. 5,399,102, which is a continuation-in-part of Ser. No. 155,382, Nov. 22, 1993, abandoned. This application Oct. 20, 1994, Ser. No. 326,228

The portion of the term of this patent subsequent to Mar. 21, 2012, has been disclaimed.

Int. Cl.⁶ H01R *11/00*

U.S. Cl. 439—505 **1 Claim**



1. A breakaway electrical connection cord adapted for coupling a mobile, electrically powered floor-engaging appliance having an elongated electrical power cable terminating in an appliance male

connector with a normal stationary electrical outlet receptacle in order to prevent significant damage to said appliance male connector in the event that an undue tension load is experienced by the power cord during movement of the appliance, said breakaway electrical connection cord consisting essentially of:

a stretch of flexible electrical cable having first and second ends;

a female electrical receptacle operatively coupled with said first end of said stretch of cable; and

a male electrical connector having a mating configuration with said female electrical receptacle at said first end of said cable stretch and adapted for insertion into a normal, stationary electrical outlet receptacle, said male electrical connector being operatively coupled with said second end of said stretch of cable,

said breakaway electrical connection cord having a maximum length of up to about 12 inches,

said appliance male connector being separable from said female electrical receptacle by an undue tension load that turns and twists said female electrical receptacle prior to separation of the connection cord male electrical connector from the stationary electrical outlet when the mobile floor-engaging appliance is pulled at an angle to the stationary electrical receptacle under said undue tension load.

5,462,453
ELECTRICAL CONNECTOR FOR BATTERY TERMINALS

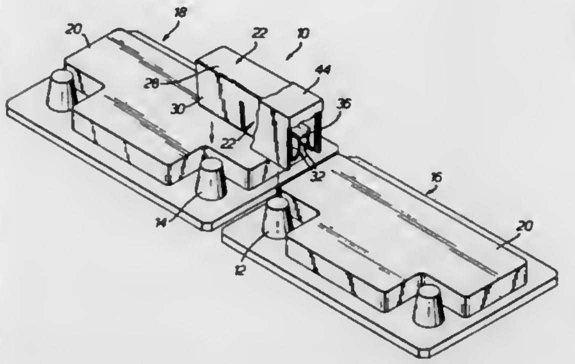
Fabien Muller, Hundling, France, assignor to Delphi France Automotive Systems, Gennevilliers, France

Filed Apr. 28, 1994, Ser. No. 234,815

Claims priority, application United Kingdom, May 1, 1993, 9309096

Int. Cl.⁶ H01R *4/42*

U.S. Cl. 439—510 **9 Claims**



1. An electrical connector adapted to slide on and off a battery terminal having a known minimum diameter, said connector comprising an electric contact of electrically conductive material having a longitudinal axis and a substantially U-shaped cross-section transverse said axis, said contact being defined by a base portion and a pair of resilient legs extending away from the base portion, said legs each having a distal portion bent backwardly on its associated leg and inwardly of said legs to form a pair of resilient arms directed back towards the base portion, said arms being spaced apart from each other and converging on each other to define a longitudinally extending slot therebetween, said slot having a first inner width which is less than said diameter and a second outer width which is greater than said diameter, and a housing of electrically insulating material surrounding the electric contact and having an opening adjacent the slot adapted to receive the battery terminal.

5,462,454
SOLDERLESS BOARDLOCK

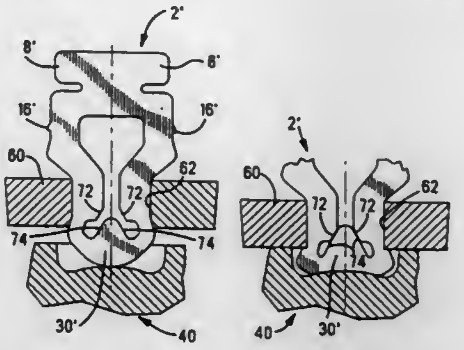
Rudolf Krämer, Lautertal, and Manfred Schaarschmidt, Bensheim, both of, Germany, assignors to The Whitaker Corporation, Wilmington, Del.

Filed Jun. 13, 1994, Ser. No. 258,647

Claims priority, application United Kingdom, Jun. 30, 1993, 9313492

Int. Cl.⁶ H01R *13/73*

U.S. Cl. 439—571 **16 Claims**



1. A boardlock for mechanically fixing a connector to a printed circuit board wherein the boardlock is a unitary edge-stamped sheet metal part comprising a U-shaped board mounting section, and a connector mounting section, the board mounting section comprising a pair of rigid arms joined at a lower end by a deformable bridge portion whereby the rigid arms and bridge portion are insertable through a hole in the printed circuit board and the bridge portion is permanently deformable such that the boardlock is held securely to the board without requiring post-soldering, the bridge portion being deformable into a substantially concave arcuate shape whereby a center portion of the bridge portion is disposed roughly at a centerline of the board hole and is at a lesser distance to the printed circuit board than extremities of the arc when deformed, and wherein the bridge portion comprises a pair of deformable arms of less width than the rigid arms, and a center portion joining the arms whereby the center portion is of greater width than the deformable arms and whereby the added thickness of the center portion is directed towards the board to allow the concave arcuate deformation of the bridge portion to occur.

5,462,455
MULTIPLE CONTACT PLUG HAVING ENCODING COMPONENTS INTERFITTABLE IN SELECTED POSITIONS

Hans Reichle, Wetikon, Switzerland, assignor to Reichle + De Massari AG, Wetzikon, Switzerland

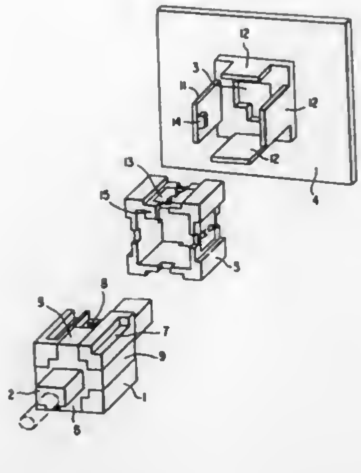
Filed Aug. 12, 1993, Ser. No. 104,528

Claims priority, application Switzerland, Aug. 26, 1992, 02645/92

Int. Cl.⁶ H01R *13/64*

U.S. Cl. 439—681 **11 Claims**

1. A modular multiple contact assembly comprising a plug; a socket member including a socket opening for receiving the plug in a predetermined orientation; a first encoding sleeve; first securing means for securing said first encoding sleeve to said plug; a second encoding sleeve; and second securing means for securing said second encoding sleeve to said socket member; at least one of said first and second encoding sleeves being angularly and end-over-end placeable into a plurality of positions to bring into alignment different cross-sectional shapes of said one encoding sleeve with the other of said first and second encoding sleeves; in a selected one of said positions one of said cross-sectional shapes matching with a cross-sectional shape of said other encoding sleeve, whereby in said selected position said first and second encoding sleeves fitting into one another to allow insertion of said plug into said socket opening.



5,462,456

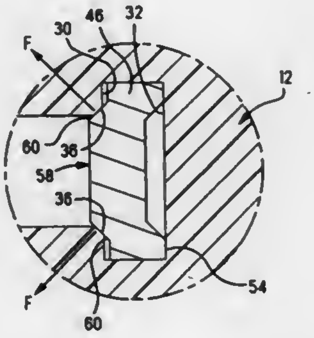
CONTACT RETENTION DEVICE FOR AN ELECTRICAL CONNECTOR

David G. Howell, Madison, N.C., assignor to The Whitaker Corporation, Wilmington, Del.

Filed Oct. 11, 1994, Ser. No. 321,335

Int. Cl.^{6} H01R *13/41*

U.S. Cl. 439—733.1 **7 Claims**



1. A contact retention device for an electrical connector, comprising:

a dielectric housing having a cavity extending inwardly from an exterior face of the housing, the cavity having opposed first and second substantially parallel walls, the first wall having a selected length in a first direction substantially parallel to the exterior face of the housing, a recess in the first wall having a selected length in the first direction which is less than the selected length of the first wall, the recess having side walls which define corners where the side walls intersect the first wall; and,

a contact having a retention section configured for insertion into the cavity from the exterior face of the housing, the retention section including a base surface associated with the second wall and an oppositely facing surface having an embossed section associated with the recess, the embossed section defining non-parallel side surfaces associated with the corners such that, upon insertion of the contact into the cavity, the base surface is in abutment with the second wall and the side surfaces are in engagement with the housing at said corners in an interference fit, thereby retaining the contact in the housing.

5,462,457

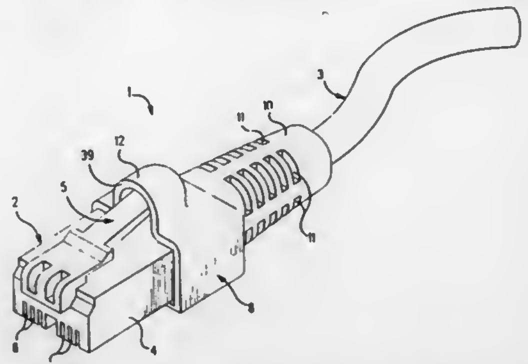
OVERMOLD STRAIN RELIEF AND SNAG PREVENTION FEATURE

Richard C. Schroepfer, Thompsontown, and Edward E. Knisely, Jr., Middletown, both of Pa., assignors to The Whitaker Corporation, Wilmington, Del.

Filed Sep. 22, 1994, Ser. No. 310,553

Int. Cl.^{6} H01R *13/405*

U.S. Cl. 439—736 **9 Claims**



1. An electrical cable assembly comprising: an electrical connector terminating an electrical cable, an insulating housing of the connector, a moveable latch on the connector for latching removably to another mating electrical connector, an overmold formed on a part of the housing, the overmold adheres to the housing and has a strain relief pocket that at least partially overlaps a portion of the moveable latch to prevent snagging of the latch, said strain relief pocket having an inwardly deflectable wall.

5,462,458

ELECTRICAL CONNECTOR

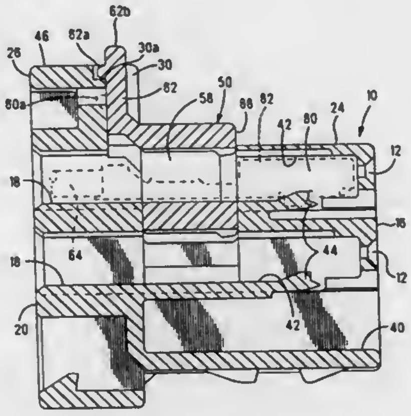
Tetsuya Sagawa, Yamato, Japan, assignor to The Whitaker Corporation, Wilmington, Del.

Continuation of Ser. No. 266,031, Jun. 27, 1994, abandoned. This application Mar. 23, 1995, Ser. No. 409,624

Claims priority, application Japan, Aug. 31, 1993, 5-051940 U

Int. Cl.^{6} H01R *13/436*

U.S. Cl. 439—752 **7 Claims**



1. An electrical connector comprising:

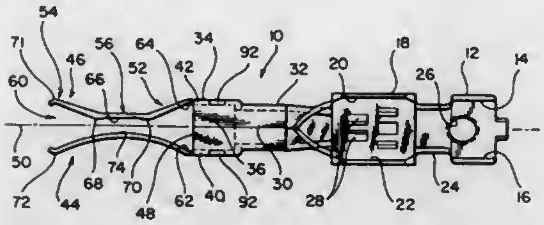
an insulating housing having multiple contact receiving cavities into which the contacts are inserted in a longitudinal direction from an end of the housing, and a locking device inserted from a side surface of said insulating housing in a lateral direction into an aperture formed in said housing;

multiple latching arms formed in said locking device which are inserted in respective guiding grooves made in a flange formed at one end of the insulating housing;

characterized by the fact that tips formed on free ends of the latching arms extend laterally beyond said flange during temporary locking of the locking device, but said tips do not extend beyond said flange when the locking device is in a fully inserted position.

5,462,459
SPRING-TYPE ELECTRICAL RECEPTACLE

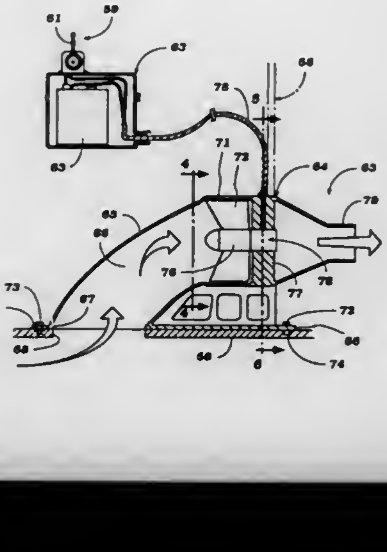
Jonathan Childs, Rochester, Mich., assignor to Cardell Corporation, Rochester Hills, Mich.
Filed Sep. 30, 1994, Ser. No. 312,967
Int. Cl.^{6} H01R *13/11*
U.S. Cl. 439—843 16 Claims



1. An electrical connector, comprising:
- a plug-type terminal having an elongated contact tip; and
- a receptacle including
  - a body portion having a longitudinal axis; and
  - first and second spaced, opposed arms connected at respective first ends to said body portion and extending longitudinally from said body portion to respective free ends, said arms being located parallel to and on opposite sides of said axis to define a receptacle for said contact tip, at least said second arm being generally convex longitudinally and including a pair of transverse, spaced ribs defining first and second contact lines spaced along said axis for engaging a first surface of said elongated contact tip upon insertion of said contact tip into said receptacle, said first arm being convex and continuously curved in a plane extending from said body portion to its respective free end and including a third transverse contact line for engaging a second surface of said elongated contact tip upon insertion of said contact tip into said receptacle, said third contact line being located along said axis between said first and second contact lines.

5,462,460
JET PROPULSION UNIT AND PRIME MOVER THEREFORE

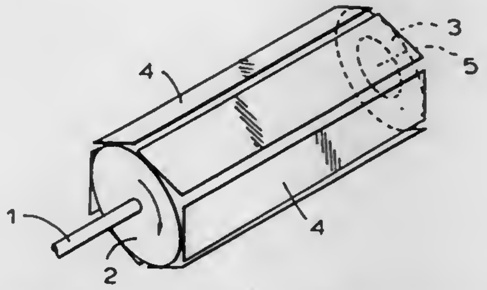
Noboru Kobaysahi, Shizuoka, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan
Filed Apr. 8, 1994, Ser. No. 224,829
Claims priority, application Japan, Apr. 8, 1993, 5-082133
Int. Cl.^{6} B60L *11/02*
U.S. Cl. 440—6 14 Claims



1. A jet propulsion and prime mover unit comprised of an outer housing assembly defining a water inlet opening through which water may be drawn from a body of water, a water inlet duct leading from said water inlet opening in a generally upward direction to an impeller housing, an impeller journalled within said impeller housing for drawing water from said water inlet duct, a discharge duct disposed vertically above said water inlet opening and leading from said impeller housing for discharging water pumped by said impeller back to the body of water under all operational conditions and propelling an associated watercraft, sand a prime mover contained within said outer housing between said impeller and aid discharge duct and coupled to said impeller for driving said impeller.

5,462,461
WATER JET PROPULSIVE DEVICE

Shevchenko A. Jgorevich, Box 366, 103008 Moskve, U.S.S.R.
Filed Nov. 2, 1994, Ser. No. 333,259
Int. Cl.^{6} B63H *11/00*
U.S. Cl. 440—38 12 Claims

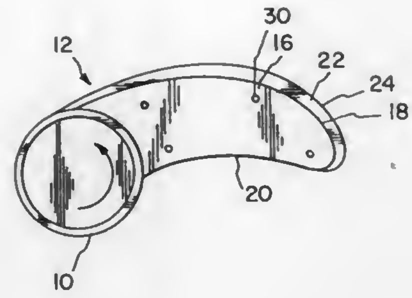


1. A water jet propulsive device, comprising
- a rotor to be rotated and has an axis, said rotor forming an inner water passage and having a front wall, a peripheral wall, and a rear wall, said rotor being adapted to be located below a waterline, said front wall of said rotor being water impermeable, said peripheral wall of said rotor being formed by a plurality of blades which extend in an axial direction from said front wall rearwardly to said rear wall and are circumferentially spaced from one another to form herebetween gaps which form a water inlet, said rear wall being water permeable so as to form a water outlet, so that during rotation of said rotor water enters an interior of said rotor through said gaps substantially radially and leaves the interior of said rotor substantially axially through said water permeable rear wall so as to propel said rotor axially forwardly.

5,462,462
MODIFIED PROPELLER BLADE

Frank Woodley, 3106 Karen Dr., Naples, Fla. 33962
Continuation of Ser. No. 893,834, Jun. 4, 1992, abandoned. This application Mar. 7, 1995, Ser. No. 400,455
Int. Cl.^{6} B63H *1/14*
U.S. Cl. 440—49 7 Claims

1. In a marine electric trolling motor having a hub means with a propeller means having at least one plastic blade extending radially from the propeller and hub means, said plastic blade having a body portion providing top and bottom surfaces with a leading edge and a trailing edge, the improvement comprising:
- said plastic blade surface is modified at least in part by a thin metal sheet mounted thereon,
- said thin metal sheet having a thin metal forward cutting edge extending outwardly beyond the leading edge of the plastic blade,
- said thin metal forward cutting edge cuts weeds during marine operation preventing entanglement of weeds on said blade and propeller means.



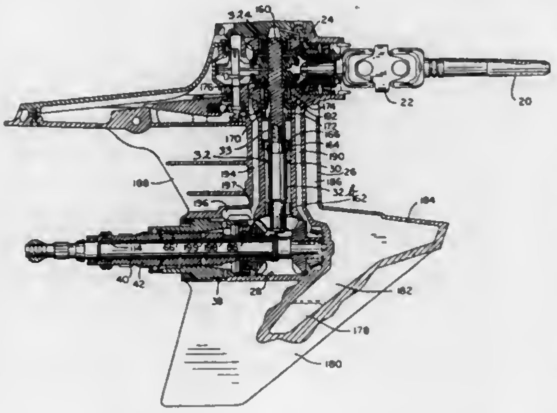
5,462,463
MARINE DUAL PROPELLER LOWER BORE DRIVE ASSEMBLY

Gary L. Meisenburg; Edward C. Eick; Phillip D. Magee; Charles M. Mixon, all of Stillwater, Okla.; Robert B. Weronke, Oshkosh, Wis.; Waylon D. Shields; Woody R. Smith, both of Stillwater, Okla., and Steven J. Pavey, Carney, Okla., assignors to Brunswick Corporation, Skokie, Ill.

Continuation of Ser. No. 69,163, May 28, 1993, Pat. No. 5,366,398, which is a continuation-in-part of Ser. No. 889,530, May 27, 1992, Pat. No. 5,249,995. This application Nov. 21, 1994, Ser. No. 342,837

Int. Cl.⁶ B63C *9/00*

U.S. Cl. 440—80 **7 Claims**



1. A marine drive comprising:
- a housing having a horizontal bore and an intercepting vertical bore therein;
- a vertical driveshaft positioned in said vertical bore;
- a spool positioned in said horizontal bore and having a forward end terminating aft of said vertical bore;
- a first inner propeller shaft;
- a second hollow outer propeller shaft positioned over said first propeller shaft to form a dual propeller shaft assembly,
  - said dual propeller shaft assembly positioned in said horizontal bore and supported by said spool,
  - said first propeller shaft counter-rotating with respect to said second propeller shaft;
- a first passage in said housing communicating with said horizontal bore rearwardly of said forward end of said spool and rearwardly of said vertical bore;
- a second passage in said housing communicating with said horizontal bore forwardly of said forward end of said spool and rearwardly of said vertical bore and circulating lubricant to said horizontal bore, said second passage being exclusively a lubricant passage.

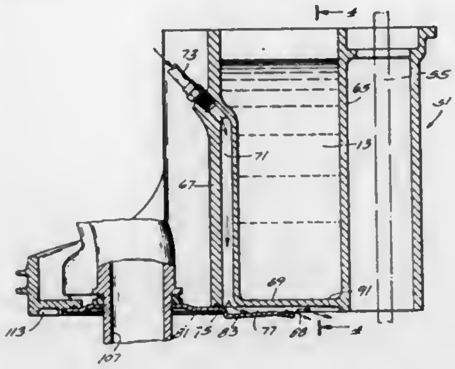
5,462,464
OUTBOARD MOTOR WITH OIL SUMP COOLING ARRANGEMENT

Lam H. Ming, Tsing Yi Island, Hong Kong, assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Jun. 3, 1994, Ser. No. 253,862

Int. Cl.⁶ B63H *21/38*

U.S. Cl. 440—88 **23 Claims**



1. A drive shaft housing including outer side walls extending in spaced relation to each other, a forwardly located wall extending between said outer side walls, a rearwardly located wall spaced rearwardly from said forwardly located wall and extending between said outer side walls, a bottom wall extending between said outer side walls and between said forwardly and rearwardly located walls, and having a bottom surface, said outer side walls, said forwardly and rearwardly located walls, and said bottom wall defining an oil sump, a coolant passage extending vertically in one of said outer side walls, said forwardly located wall, and said rearwardly located wall, being adapted, adjacent the upper end thereof, for connection to a source of coolant, and terminating, at the lower end thereof, in a discharge port located in said bottom wall, and a deflector fixed to said bottom wall and defining with said bottom surface of said bottom wall a conduit extending along said bottom wall and having a first end communicating with said discharge port in said bottom wall, and a discharge end terminating in an elongated discharge area defined between said bottom surface and a free edge of said deflector plate, whereby to provide coolant flow along a substantial portion of the bottom surface of said bottom wall.

9. An oil sump including outer side walls extending in spaced relation to each other, a forwardly located wall extending between said outer side walls, a rearwardly located wall spaced rearwardly from said forwardly located wall and extending between said outer side walls, a bottom wall extending between said outer side walls and between said forwardly and rearwardly located walls, and having a bottom surface, and a deflector fixed to said bottom wall and defining with said bottom surface of said bottom wall a conduit extending along said bottom wall and having a first end adapted to communicate with a source of coolant, and a discharge end terminating in an elongated discharge area defined between said bottom surface of said bottom wall and a free edge of said deflector.

5,462,465
MARINE TRANSMISSION MOUNTING SYSTEM

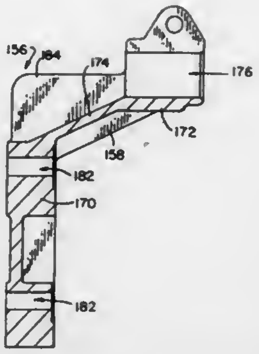
Keith W. Schmidt, Stillwater, Okla., assignor to Brunswick Corporation, Lake Forest, Ill.

Filed May 16, 1994, Ser. No. 243,402

Int. Cl.⁶ B63H *21/30*

U.S. Cl. 440—111 **7 Claims**

1. A transmission mounting system that mounts a marine transmission to a joist of a boat, the system comprising:
- a mount base that can be securely mounted to a joist of a boat, the mount base having an upwardly extending stud;
- a trunion having an opening for receiving the stud; and



a transmission mounting bracket for mounting the transmission to the trunion, the transmission mounting bracket having a transmission attachment portion for attaching the bracket to the transmission, a trunion receiving portion having an opening for receiving the trunion, a spanning portion that spans between the transmission attachment portion and the trunion receiving portion, and a reinforcement web located above the spanning portion.

5,462,466

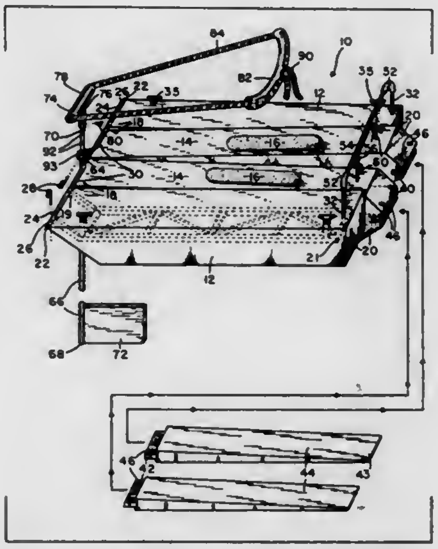
OCCUPANT ACTUATED WATER VEHICLE

Harold L. Hull, 401 Canyon Way #43, Sparks, Nev. 89434, and Michael J. Choat, 220 Callente St., Reno, Nev. 89509

Filed Dec. 30, 1994, Ser. No. 367,019

Int. Cl.^{6} A63C ***15/03***

U.S. Cl. 441—76 **14 Claims**



1. An occupant actuated water vehicle comprising: an outer and inner pair of substantially elongated buoyant members, said members having a top surface for supporting said occupant, a first and second end and a side-by-side relationship, said first end of said outer members being removably, fixidly attached to a horizontal connecting rod, a steering means, said rod having means to attach said steering means, said first end of said inner pair of members being removably, hingidly attached to said horizontal rod, said second end of each of said outer pair of members being interconnected by a fixidly attached pulley support structure which supports at least one pulley fixidly attached thereto, said second end of each of said inner members having means to removably attach a flipper, said flipper having first and second ends, a cable interconnecting each of said second ends of said inner members through said pulley, said cable and said pulley working in combination, whereby:

providing and allowing simultaneous, alternating, vertical movement of said second ends of said inner members when said cable and said pulley are actuated by said occupant.

5,462,467

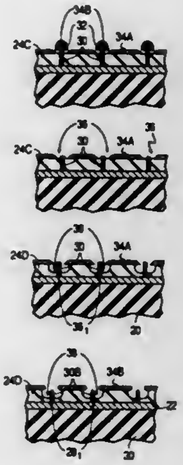
FABRICATION OF FILAMENTARY FIELD-EMISSION DEVICE, INCLUDING SELF-ALIGNED GATE

John M. Macaulay, Palo Alto, Calif.; Peter C. Searson, Baltimore, Md.; Robert M. Duboc, Jr., and Christopher J. Spindt, both of Menlo Park, Calif., assignors to Silicon Video Corporation, Cupertino, Calif.

Filed Sep. 8, 1993, Ser. No. 118,490

Int. Cl.^{6} H01J ***9/02***

U.S. Cl. 445—50 **82 Claims**



1. A method comprising the steps of:

creating a structure in which a porous electrically insulating layer lies over a patterned lower electrically conductive region comprising a group of generally parallel lines situated over electrically insulating material of a substrate, a multiplicity of pores extending through the porous layer down to the lower conductive region, the pores having an average diameter of no more than 200 nm; and

subsequently introducing electrically conductive filament material into the pores to form corresponding electron-emissive filaments therein, the lower end of each filament contacting the lower conductive region.

5,462,468

CRT ELECTRON GUN CLEANING USING CARBON DIOXIDE SNOW

Richard A. Bailey, Canton, Mich., and John C. Midavaine, Rochester, N.Y., assignors to Philips Electronics North America Corporation, New York, N.Y.

Filed Dec. 16, 1994, Ser. No. 358,450

Int. Cl.^{6} H01J ***9/38***

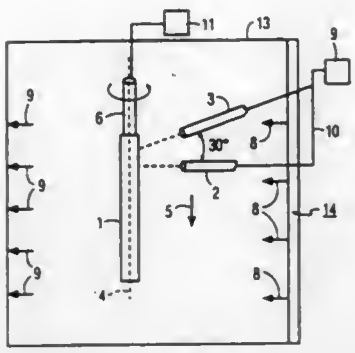
U.S. Cl. 445—59 **6 Claims**

1. A method of cleaning CRT electron guns comprising the steps of

(a) heating an electron gun,

(b) rotating said electron gun, and

(c) passing combined CO_2 particles and CO_2 gas along all surfaces of said electron gun to remove contaminants from said electron gun.



5,462,469

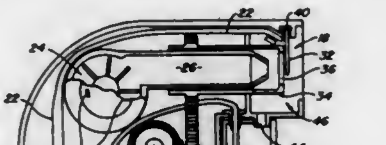
APPARATUS AND METHOD FOR MAKING BUBBLES

Cheong S. Lei, Macau, Macau, assignor to Jactoys Limited, Kowloon, Hong Kong

Filed Aug. 24, 1993, Ser. No. 111,073

Int. Cl.⁶ A63H *33/28*

U.S. Cl. 446—15 **14 Claims**



1. A bubble making toy comprising:

a rotatable support member;

a film support member provided in said support member and having an aperture; and

means for forming a film of soap over the aperture in the film support member, said forming means including a pivoting element adapted for receiving a soapy mixture and pivotable over the face of the aperture to transfer the soapy mixture from the pivoting element to the aperture and thereby form the film of soap thereover, the aperture receiving the soapy mixture from the pivoting element only and the film of soap forming a bubble upon direction of a stream of air through the aperture.

5,462,470

GRINDING WHEEL SPINDLE ASSEMBLY

Yoshimasa Oda, and Masato Ota, both of Narashino, Japan, assignors to Seiko Seiki Kabushiki Kaisha, Japan

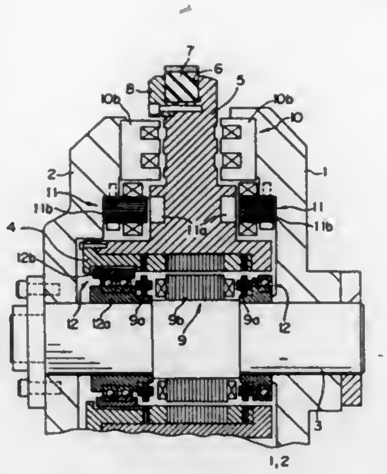
Filed Oct. 20, 1993, Ser. No. 140,227

Claims priority, application Japan, Jan. 26, 1992, 4-287940

Int. Cl.⁶ B24B *45/00*

U.S. Cl. 451—294 **19 Claims**

1. A grinding wheel spindle assembly comprising: a first casing; a second casing spaced apart from and facing the first casing; a shaft having one end fixed to the first casing and another opposite end fixed to the second casing; a hollow, cylindrical-shaped rotor rotatably disposed over the shaft and between the first and second casings to undergo rotation relative to the shaft; a flange having opposite side surfaces and connected to an outer circumference of the rotor for rotation therewith; a grindstone connected to an outer circumference of the flange for rotation therewith; radial magnetic bearing means for magnetically supporting the rotor in its radial direction; axial magnetic bearing means for magnetically supporting the rotor in its axial direction; and driving means for rotationally driving the rotor about a center axis thereof.



5,462,471

SELF-CONTAINED DISPLAY DEVICE FOR HEADWEAR

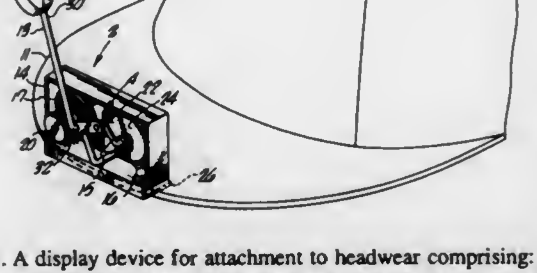
Stephen N. Power-Fardy, 4233 W. 172nd St., Torrance, Calif. 90504

Continuation of Ser. No. 879,197, Jun. 11, 1992, abandoned, which is a continuation-in-part of Ser. No. 699,672, May 14, 1991, Pat. No. 5,167,559. This application Apr. 13, 1994, Ser. No. 227,056

The portion of the term of this patent subsequent to Dec. 1, 2009, has been disclaimed.

Int. Cl.⁶ A63H *33/00;13/18;* **C09F** *3/00*

U.S. Cl. 446—26 **6 Claims**



1. A display device for attachment to headwear comprising:

a self-contained power source able to reciprocate a reciprocating arm and effectively enclosed within a housing, wherein said power source oscillates said reciprocating arm at one pace through one established arc of movement in one plane;

a plate resiliently extending from and integral with a base of said housing, wherein said plate comprises a spring-clamp grasping mechanism connected to said base and is adapted to releasably engage a portion of a planar extension of said headwear;

one or more reciprocating arms extending through said housing and attached at a first end of said reciprocating arms to a mechanism for transmission of power from said self-contained power source and having a display symbol attached at the end of the second end of said reciprocating arm.

5,462,472

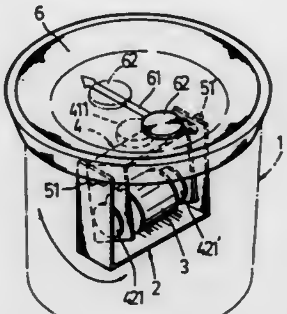
MAGNETIC INDUCTION TOY

Mon S. Lin, 5th Fl. No. 4, Lane 7, Pao Kao Road, Hsintien, Taipei Hsien, Taiwan, Prov. of China

Filed Apr. 19, 1994, Ser. No. 229,904

Int. Cl.^{6} A63H *33/26*

U.S. Cl. 446—135 **2 Claims**



1. A magnetic force induced toy comprising:

a battery;

a cylindrical, top-open casing having a battery chamber at the bottom to hold the battery;

a substantially U-shaped holder frame fastened within said casing, said holder frame comprising a flat horizontal wall fixed to said casing above said battery chamber, and two vertical side walls vertically extended upwards from said horizontal wall at two opposite ends, each side wall having an elongated slot transversely disposed near the respective topmost edge;

an electromagnet fastened to said horizontal wall of said holder frame between said vertical side walls and electrically connected to the battery in said battery chamber to produce a magnetic field;

a rocker arm pivotably fastened between said vertical side walls of said holder frame, said rocker arm comprising two unitary side bars vertically extended downwards from two opposite ends of a horizontal base thereof, a top permanent magnet fastened to said horizontal base at the top in the middle, two permanent magnets respectively fastened to said side bars and aimed at said electromagnet to produce a respective magnetic repulsion, said side bars having each a pin hole respectively aligned with the elongated slot on either vertical side wall of said holder frame;

a pivot pin inserted through the elongated slot on each vertical side wall of said holder frame and the pin hole on each side bar of said rocker arm to suspend said rocker arm between the side walls of the holder frame, said pivot pin having two opposite ends each respectively fastened to the elongated slot on the vertical side walls of said holder frame by a respective cap;

a cover covering said casing at the top, said cover having a course guide sign to indicate the rocking direction of said rocker arm;

an operation control permanent magnet for moving or stopping said rocker arm; and

at least one ornamental device respectively placed above said cover;

whereby said rocker arm is induced to oscillate on said pivot pin by placing said operation control permanent magnet on said cover with one pole facing toward the permanent magnet on said base of said rocker arm to produce a magnetic repulsion and then moving said operation control permanent magnet along said course guide sign; said rocker arm is stopped by placing the other pole of said operation control permanent magnet on said cover toward the permanent magnet on said base of said rocker arm to produce a magnetic attraction.

5,462,473

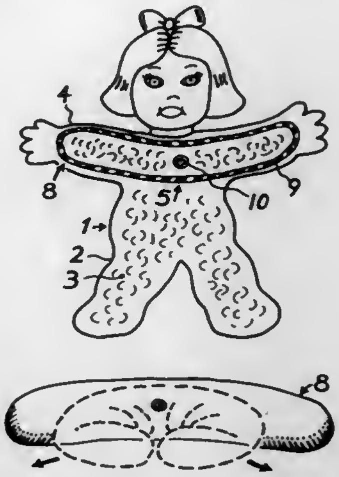
TOY WITH SLOW MOVEMENT RECOVERY

Ken Sheller, 30 W. 15 St., New York, N.Y. 10011

Filed Jul. 1, 1994, Ser. No. 269,570

Int. Cl.^{6} A63H *3/06*

U.S. Cl. 446—183 **14 Claims**



1. A life-size huggable doll having a body comprising a porous, soft, cloth like fabric covering a soft stuffing, the body including a flexible pair of arms extending from a chest portion in one of open and closed positions, a slow return motion producing insert comprising an elongate, tubular, resiliently compressible air bag with a slow leak means and mounted in the body to extend across the chest and along respective arms, whereby a child can deform the arms from one of the positions to another, compressing the air bag and the resiling action of which returns said arms slowly to an undeformed position while producing a simulated natural gesture of affection.

5,462,474

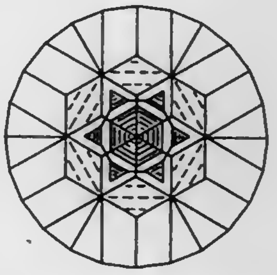
METHOD OF FACETTING A GEM

Erling Hansen, Tucson, Ariz., assignor to Ronald W. Swager, Tucson, Ariz.

Filed May 24, 1994, Ser. No. 248,393

Int. Cl.^{6} B24B *1/00*

U.S. Cl. 451—41 **13 Claims**



7. A method of faceting a gem having a first set of facets on a first end thereof, the method comprising the steps of, at a second end of the gem:

a) creating a second set of facets being six facets in the range of thirty to sixty degrees;

b) creating a third set of facets being twelve facets having angles 9 to 10.5 degrees less than the angle of the second set of facets;

c) creating a fourth set of facets being six facets having angles 4 to 6 degrees less than the angles of the third set of facets;

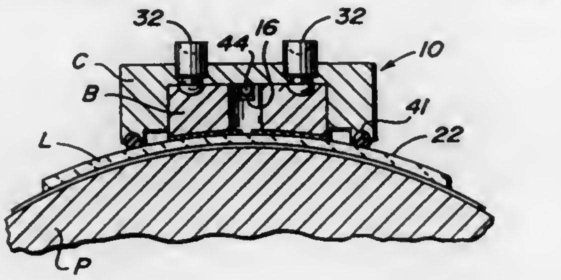
d) creating a fifth set of facets being six facets having angles at least one-half degree less and than the angles of the fourth set of facets;

e) creating a sixth set of facets being six facets having angles at least one-half degree less than the angles of the fifth set of facets; and,

f) creating a seventh set of facets being twelve facets having angles at least three degrees more than the angles of the second set of facets.

5,462,475
BLOCKING SYSTEM FOR PRESCRIPTION LENSES

Brian H. Kennedy, Charlottesville, Va., assignor to National Optronics, Inc., Charlottesville, Va.
Filed Feb. 12, 1993, Ser. No. 16,940
Int. Cl.^{6} B24B *41/06*
U.S. Cl. 451—384 **4 Claims**



1. A device for transmitting rotational force to a lens from a machine during the generating, fining, and polishing of a lens, the device comprising:

a cylindrical block (B) having first and second oppositely disposed faces and a circumferential wall (**18**) of substantially constant thickness extending therebetween, said first face (**12**) being substantially planar across its entire diameter and said second face (**20**) defining an arc across its entire diameter for mating with the lens (L), said first face (**12**) of said cylindrical block defining a pair of pin locating holes (**14**) for engaging chuck centering pins of a generating machine which maintain the axial position of the lens (L) during generating, each of said pin locating holes (**14**) having a metal insert (**15**) disposed therein to protect the block from excessive wear;

a pin slot (**16**) defined in said first face of said block, said pin slot extending diametrically across said first face through said pin locating holes (**14**) so as to open at said circumferential wall (**18**) on opposite sides of said block, said pin slot (**16**) being defined in said first face (**12**) such that the depth of said pin locating holes (**14**) is substantially greater than the depth of said pin slot;

a double-sided adhesive pad (A) adhered to the second face (**20**) of said block so as to be disposed directly between said block and the lens, said double-sided adhesive pad having a substrate and opposing faces having pressure sensitive adhesive material applied thereto for securing the lens to said block;

a cylindrical collar (C) coupled to said block for surrounding and engaging said block during fining and polishing of the lens, said collar having an outer planar face (**30**) and an opposing inner face (**34**), said inner face (**34**) of said collar for engaging said first face (**12**) of said block, said collar including a pair of diametrically opposed contacts (**32**) of hardened steel protruding from said outer face for engaging pins of a cylinder machine during fining and polishing of the lens, said contacts being radially spaced from said pair of pin locating holes defined in said block when said collar and said block are engaged;

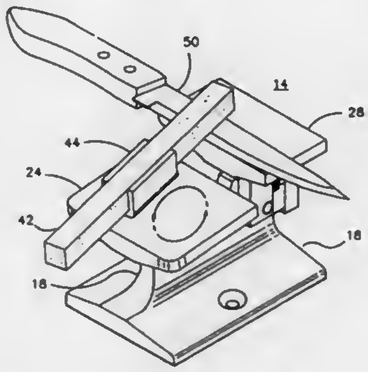
a compressible O-ring disposed around the circumference of said inner face (**34**) of said collar for contacting the lens so as to uniformly transfer rotating force to the lens without causing said adhesive pad to be compressively deformed;

a diametrically extending roll pin (**41**) affixed to said inner face of said collar in a manner such that said roll pin rests in said pin slot (**16**) of said block when said collar and said block are engaged adjacent the lens, whereby said roll pin maintains the position of said collar relative to said block and the lens during the fining and polishing processes; and

wherein said inner face of said collar has a diametrically terraced or stepped surface including a plurality of substantially parallel levels so that the central area of said inner face engages said first face (**12**) of said block and the outer area of said inner-face is closer to the lens and engages said O-ring.

5,462,476
BLADE SHARPENING DEVICE

Roy W. Bohn, Kifer Rd., P.O. Box 663, Milesburg, Pa. 16853
Filed Sep. 8, 1994, Ser. No. 360,869
Int. Cl.^{6} B24B *7/00*
U.S. Cl. 451—558 **11 Claims**



1. A blade sharpening device comprising:

a base member with a groove therethrough;

a blade support table movably attached to said base member and clampable to said base member and having a generally horizontal, flat, upper surface for holding a blade member;

a sharpening stone support table having a substantially flat surface and being pivotally attached to said base member;

a sharpening stone shoe positioned on said substantially flat surface of said stone support table;

a sharpening stone positioned in said shoe and when extended to contact said blade forms an angle with said horizontal surface;

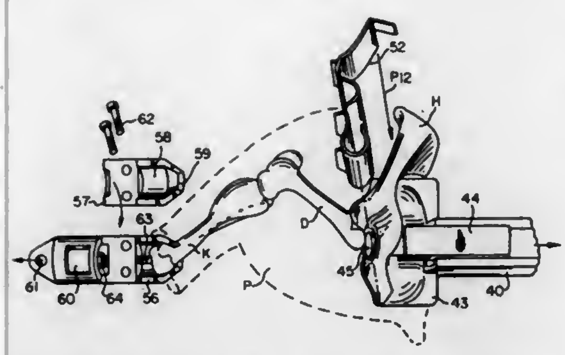
an angle selection chart attached to said blade support table adapted to indicate the angle between said sharpening stone and said blade support table,

whereby said sharpening stone may be moved in any direction on said substantially flat surface and in contact with said blade to sharpen said blade.

5,462,477
METHOD AND DEVICE FOR DEBONING LEG PIECES OF SLAUGHTERED ANIMALS

Gerardus H. J. Ketels, Grave, Netherlands, assignor to Stork Protecon B.V., Netherlands
Filed Sep. 28, 1993, Ser. No. 127,973
Claims priority, application Netherlands, Sep. 29, 1992, 9201678; Mar. 30, 1993, 9300564
Int. Cl.^{6} A22C *17/02*
U.S. Cl. 452—135 **28 Claims**

1. A device for fixedly holding a meat piece provided with a plurality of bone portions, wherein the bone portions lie substantially mutually in line, and wherein holding takes place on an end portion of the meat piece, comprising a carrier embodied with the holding device, which said carrier is provided with at least two elements closable toward and openable away from each other for gripping the bone portion contained in the meat wherein one element includes a first profiled member which is movable along one side of the relevant bone in the direction of the clamp and the other element is a second profiled counter member which can be carried in a movement substantially perpendicularly of the first member, and



wherein an edge of at least one of the profiled members is embodied as a cutting edge and has a waved shape such that it connects onto the profiled surface of the other member.

5,462,478
METHOD, MOULD, DEVICE AND APPARATUS FOR PROCESSING ROUNDFISH

Bent E. Fredsby, and Erik C. Wormslev, both of Holte, Denmark, assignors to CDM - Quality Fish A/S/, Soborg, Denmark

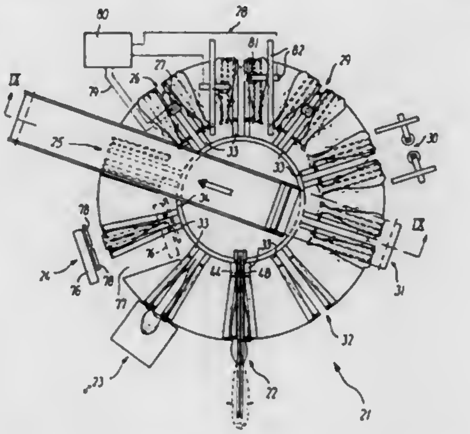
PCT No. PCT/DK92/00247, § 371 Date Mar. 10, 1994, § 102(e) Date Mar. 10, 1994, PCT Pub. No. WO93/04589, PCT Pub. Date Mar. 18, 1993

PCT Filed Aug. 21, 1992, Ser. No. 204,403

Claims priority, application Denmark, Sep. 10, 1991, 1590/91

Int. Cl.⁶ A22C *25/16*

U.S. Cl. 452—135 **22 Claims**



1. A method of processing roundfish, which have an individual weight as caught from 0.3 to 10 kilos and each has a body with a vertebral column (Columna Vertebralis) and a vertical plane of symmetry, into portion packed frozen pieces of fish meat, which roundfish after catch and ventral cleaning have been frozen onboard a fishing boat and been transported to factory in frozen condition, comprising the steps of:

positioning said roundfish with positioning means that allow the frozen fish body to be positioned with its vertical plane of symmetry aligned with a cutting means,

cutting said roundfish in said frozen condition while being held in said aligned position by fixing means in at least two frozen pieces by at least one longitudinal splitting cut following said vertical plane of symmetry of said frozen fish body, so that at least the main portion of said vertebral column is removed from said frozen fish meat by said cut,

searching said frozen pieces for possible bone remains and other unwanted impurities which subsequently, at least in part are removed from said frozen fish meat, and

packing said frozen pieces as portions and then being freeze stored.

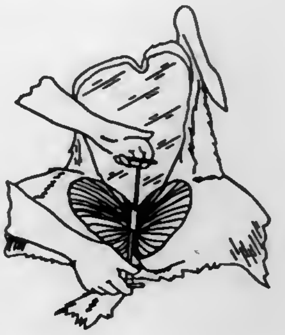
5,462,479
WILD GAME DRESSING TOOL

Michael L. Hajek, R.R. 2 Box 188, Staples, Minn. 56479, assignor to Michael L. Hajek, Staples, Minn.

Filed Nov. 7, 1994, Ser. No. 335,252

Int. Cl.⁶ A22B *5/20;* **B23D** *49/11;* **B27D** *21/00*

U.S. Cl. 452—160 **4 Claims**



1. A wild game dressing tool comprising a first elongated handle, a second elongated handle, and a saw blade, the second handle having an integral tubular coupling formed at one end thereof which slideably receives an abutting end of the first handle, and the first and second handles being connected to the saw blade at each end of the saw blade by an attachment means.

5,462,480
COIN DISPENSING APPARATUS

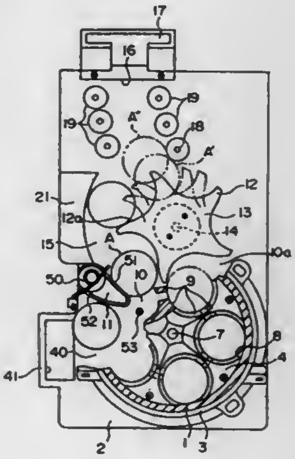
Yorio Suzukawa, Saitama, Japan, assignor to Asahi Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 3, 1994, Ser. No. 191,101

Claims priority, application Japan, Feb. 5, 1993, 5-011925 U

Int. Cl.⁶ G07D *1/00*

U.S. Cl. 453—49 **7 Claims**



1. A coin dispensing apparatus comprising: a substrate containing a first location at which a delivery outlet is arranged and a second location differing from said first location; and, a dispensing mechanism arranged to freely rotate reversibly with respect to said substrate which dispenses coins towards said delivery outlet during forward rotation; wherein, said dispensing mechanism dispenses coins returned from said delivery outlet to said second location during reverse rotation

and wherein said dispensing apparatus further comprises a coin guide member, disposed between said substrate and said rotating disc and continually extending into the rotational path of coins carried by said dispensing mechanism in both said forward and reverse rotation direction.

5,462,481

PROCESS AND APPARATUS FOR REGULATING THE SUPPLY OF FRESH AIR IN HIGH-SPEED TRAINS

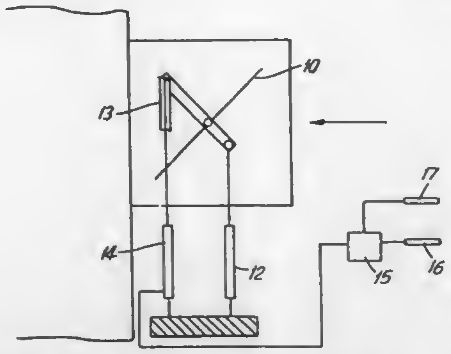
Hans J. Riedel, Leipzig, and Michael Schmerler, Halle/Saale, both of, Germany, assignors to Hagenuk Fahrzeugklima GmbH, Schkeuditz, Germany

Filed Feb. 14, 1994, Ser. No. 195,517

Claims priority, application Germany, Feb. 12, 1993, 43 04 194.9

Int. Cl.⁶ B61D *27/00*

U.S. Cl. 454—70 **18 Claims**



3. Apparatus for regulating the supply of fresh air in a compartment adapted to convey passengers at high speed, comprising:

- a pressure-valve having a flap movable between fully open and fully closed positions;
- first drive means for moving said flap between said fully open and fully closed positions;
- a stop member; and
- second drive means coupled to said stop member and operable to selectively move said stop member into a valve stop position and thereby maintain said flap in an intermediate position between said open and closed positions.

5,462,482

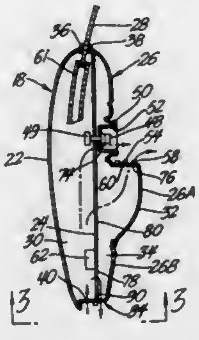
AUTOMOBILE DOOR HAVING INTERIOR TRIM PANEL WITH AIR FLOW CONTROL OPENING

John A. Grimes, Dover, N.H., assignor to Davidson Textron Inc., Dover, N.H.

Filed Oct. 31, 1994, Ser. No. 331,852

Int. Cl.⁶ B60H *1/26*

U.S. Cl. 454—143 **6 Claims**



1. In combination, an automobile body having a passenger compartment, said passenger compartment having a floor and a door opening including an imperforate door sill, a door mounted on said body operable to open and close said door opening, said door including an outer door panel and an inner door panel and an interior trim panel and a window that is moveable to open and close a window opening, window seal means providing sealing between said window and said outer and inner door panels, door seal means providing sealing between said door and said vehicle body when said door closes said door opening, said inner and outer door panels defining a space therebetween beneath said window seal means, said interior trim panel mounted on said inner door panel and closing said space, a manually operated device mounted on said inner panel and extending through a mounting opening in said interior trim panel into said passenger compartment and wherein air can pass from said space past said manually operated device and through said mounting opening into said passenger compartment, a drain hole in a lower edge of said door open to said space for normally draining water from said space that enters past said window seal means but also allows outside air to enter into said space when the passenger compartment air pressure falls below the outside air pressure, and said interior trim panel having a downwardly facing air flow control opening located laterally inward of and adjacent said door sill when said door closes said door opening and inward of said door seal means for directing outside air entering said drain hole from said space directly downward toward said passenger compartment floor while assuredly preventing the air entering through said drain hole from reaching said mounting opening and entering said passenger compartment at said manually operated device.

5,462,483

HEATING AND VENTILATING AND/OR AIR CONDITIONING APPARATUS FOR THE CABIN OF A MOTOR VEHICLE

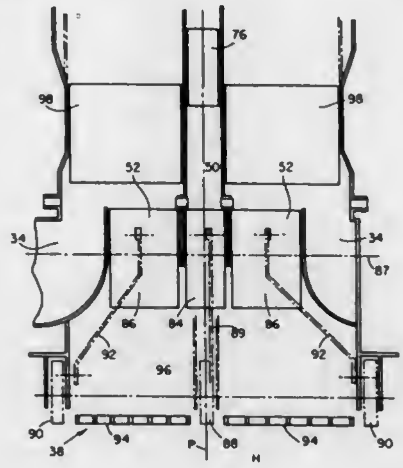
Didier Loup, Maurepas, France, assignor to Valeo Thermique Habitacle, Le Mesnil, France

Filed Dec. 1, 1993, Ser. No. 160,556

Claims priority, application France, Dec. 2, 1992, 92 14522

Int. Cl.⁶ B60H *1/26*

U.S. Cl. 454—160 **9 Claims**



1. Heating and ventilating apparatus for the cabin of a motor vehicle, comprising an aerator vent communicating with said cabin, means defining at least one first duct for leading a stream of cold air to said aerator vent, and means defining at least one second duct for leading a stream of mixed air to said aerator vent, each said duct having an outlet end, wherein the apparatus further includes: a first flap valve associated with the outlet end of said at least one first duct for controlling the flow of said cold air from the latter; a second flap valve associated with the outlet of said at least one second duct for controlling the flow of said mixed air from the latter; first control means coupled with the first flap valve for controlling the first flap valve; and second control means coupled with the second flap valve for controlling the second flap valve.

5,462,484
CLEAN-ROOM CEILING MODULE

Udo Jung, Bad Hersfeld; Herbert Eidam, Schenklengsfeld, and Wilhelm Gerk, Eiterfeld, all of, Germany, assignors to Babcock BSH Aktiengesellschaft Vormals Butner-Schilde-Haas AG, Krefeld, Germany

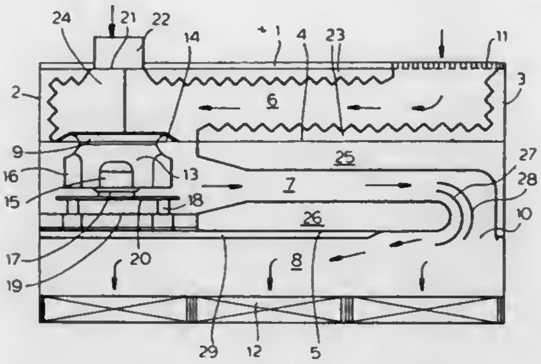
PCT No. PCT/EP92/01297, § 371 Date Nov. 30, 1993, § 102(e) Date Nov. 30, 1993, PCT Pub. No. WO93/01453, PCT Pub. Date Jan. 21, 1993

PCT Filed Jun. 10, 1992, Ser. No. 162,012

Claims priority, application Germany, Jul. 8, 1991, 41 22 582.1

Int. Cl.^{6} F24F *3/16*

U.S. Cl. 454—187 **9 Claims**



9. A module for construction of a clean-room ceiling with lamina air flow technology, comprising:

a generally rectangular housing having a ceiling and lateral walls;

upper and lower vertically spaced horizontal false floors in said housing defining an upper chamber, an intermediate chamber and a lower chamber in said housing, the upper false floor having a communicating opening at one side of said housing interconnecting said upper and intermediate chambers, said lower false floor terminating at a gap from a one of said lateral walls at an opposite side of said housing to interconnect said intermediate chamber and said lower chamber;

a fan in said intermediate chamber at said communication opening for inducing flow into said housing, through said upper chamber and said intermediate chamber and into said lower chamber;

means forming a return air opening in a ceiling of said housing at said opposite side thereof;

a plurality of high efficiency filters formed at a bottom of said housing and communicating with said lower chamber, said return air opening extending from a lateral wall of said housing at said opposite side and extending over 20–30% of a length of said housing toward said one side and over an entire width of said housing;

a sound-damping lining along an underside of said ceiling and upper surface of said upper floor;

sound-damping baffles on a lower side of said upper floor and an upper side of said lower floor defining a flow space between them extending to said gap in said intermediate chamber;

a sound-absorption plate on a lower side of said lower floor in said lower chamber; and

a rectifier baffle extending over said inlet from said lateral wall at said one side perpendicular thereto and beyond a middle of said inlet; and

an opening formed in said ceiling above said inlet for supplying conditioned air to said housing.

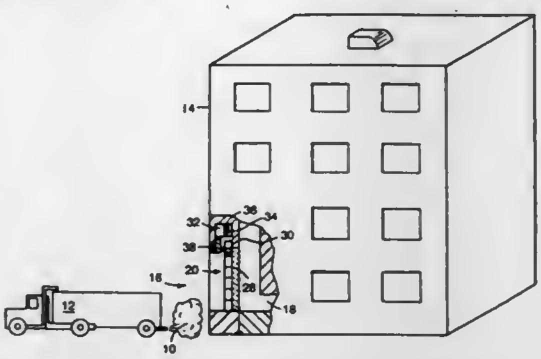
5,462,485
CONTROLLING AIR QUALITY

Devon A. Kinkead, Cumberland, R.I., assignor to Extraction Systems, Inc., Woonsocket, R.I.

Filed Dec. 3, 1993, Ser. No. 161,904

Int. Cl.^{6} F24F *11/04*

U.S. Cl. 454—256 **16 Claims**



11. A method of controlling the quantity of outside air drawn into a building comprising the steps of

sensing the concentration of pollutants in said air,

determining when said air quality is poor based upon the rate of change of said concentration of pollutants, and

responding when said air quality is poor by reducing the quantity of said air drawn into the building,

whereby the quality of air inside the building is substantially controlled.

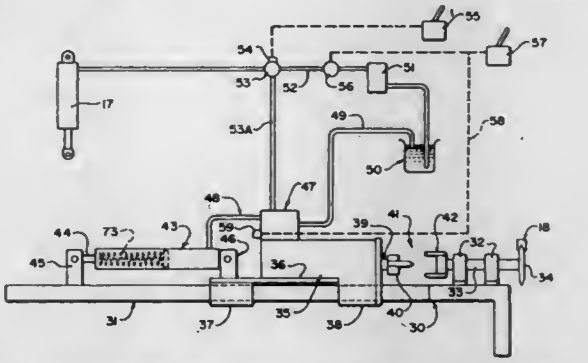
5,462,486
DRIVE REVERSING SYSTEM FOR THE FEEDER HOUSING OF AN COMBINE HARVESTER

R. Scott Norton, P.O. Box 23, Rocanville Saskatchewan, Canada

Filed Nov. 22, 1993, Ser. No. 155,120

Int. Cl.^{6} A01D *75/18;* **A01F** *12/10*

U.S. Cl. 460—20 **8 Claims**



1. A combine harvester comprising a combine harvester body including a feeder housing, a drive member for driving crop drive elements within the feeder housing and apparatus for reversing drive of the drive member for reversing the drive elements comprising a drive element for driving the drive member, a support frame for attachment to the combine harvester body, a hydraulic motor mounted on the support frame for sliding movement relative thereto and having an output drive shaft, a hydraulic cylinder having one end attached to the support frame and a second end attached to the motor and arranged to move the motor in said sliding movement relative to the support frame in a direction longitudinal of the drive shaft thereof from a retracted position to an operating position, a mechanical drive coupling between the drive element and the output drive shaft for communicating drive from the output drive shaft to the drive element and including a portion thereof mounted on the output drive shaft movable with the

motor and the output drive shaft so as to be released from communicating drive to the drive element in the retracted position and so as to communicate drive to the drive element in the operating position, connection means for connection to a source of hydraulic fluid under pressure and control valve means for receiving the hydraulic fluid and for directing the fluid to the cylinder and to the motor, said control valve means having a first port for receiving fluid from said connection means, a second port for communicating fluid to the cylinder, a third port for communicating fluid to the motor and a sequence valve arranged to prevent communication of fluid to the third port until the pressure of fluid within the body exceeds a predetermined pressure in response to movement of the cylinder to an extreme position thereof.

5,462,487

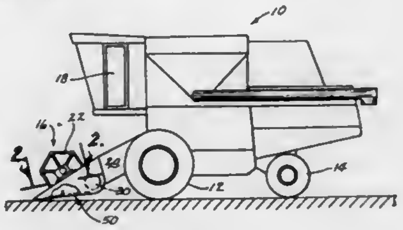
ROCK GUARD FOR A COMBINE

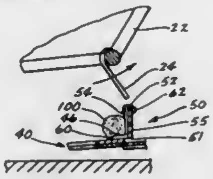
Scott A. Farley, 3386 110th St. Box 70, Jamaica, Iowa 50128, and Errol L. Meinecke, 304 E. Harrison, Jefferson, Iowa 50129

Filed Sep. 23, 1994, Ser. No. 312,478

Int. Cl.^{6} A01D *75/18*

U.S. Cl. 460—105 **18 Claims**





1. In a crop harvesting combine header including a horizontally disposed cutter bar mounted at the leading edge of a grain table, and a rotating reel disposed above the cutter bar and having resilient fingers to contact the crop and move it back onto the grain table, the improvement comprising:

- a vertically disposed guard attached to the grain table and extending upwardly therefrom, the guard including a lower edge, an upper edge, a rear vertical face, and a forward vertical face disposed behind the cutter bar to contact rocks and prevent them from moving back onto the grain table.

5,462,488

INTEGRATED CARD AND BUSINESS FORM ASSEMBLY AND METHOD FOR FABRICATING SAME ON LABEL FORMATION EQUIPMENT

John J. McKillip, Chicago, Ill., assignor to Stanley Stack, Jr., Barrington, Ill.

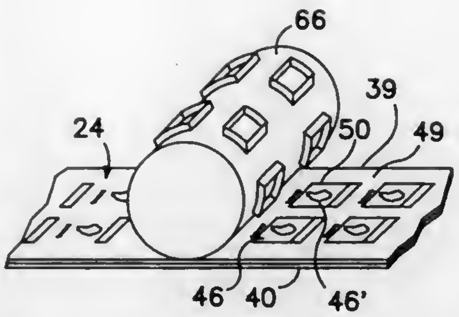
Filed May 6, 1994, Ser. No. 239,240

Int. Cl.^{6} B42D *15/00*

U.S. Cl. 462—26 **22 Claims**

1. An integrated card and business form assembly capable of being fabricated on conventional label formation equipment, or the like, said integrated card and business form assembly comprising:

- a first layer of material having an upper surface and a lower surface opposite said upper surface;
- a second layer of material comprising at least one card member together with a surrounding border region,
- said second layer of material having a top surface and a bottom surface, and, in turn, said at least one card member and said surrounding border region each having a top and bottom surface, wherein said top surface of said at least one card member is substantially co-planar with said top surface of said surrounding border region and said bottom surface of said at least one card member is substantially co-planar with said bottom surface of said surrounding border region;
- adhesive means operably applied to at least a portion of at least said upper surface of said first layer of material for releasably securing said at least one card member to said upper surface of said first layer of material;
- said at least one card member including means for releasable detachment from said upper surface of said first layer of material and from the surrounding border region without substantial portions of said adhesive means migrating from the top surface of said first layer of material to said bottom surface of said at least one card member; thereby precluding said bottom surface of said at least one card member from bearing tackiness along said bottom surface after detachment from said upper surface of said first layer of material.



5,462,489

DRIVE SHAFT FOR AUTOMOTIVE VEHICLE WATER PUMP

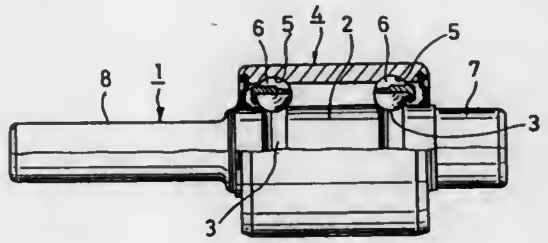
Yoshio Kan; Takeshi Nakamura, and Yukihiro Akabane, all of Kanagawa, Japan, assignors to NSK Ltd., Tokyo, Japan

Continuation of Ser. No. 978,087, Nov. 17, 1992, abandoned. This application May 10, 1994, Ser. No. 240,396

Claims priority, application Japan, Nov. 20, 1991, 3-102819 U

Int. Cl.^{6} F01P *11/00*

U.S. Cl. 464—179 **3 Claims**



1. In a drive shaft for an automotive vehicle water pump, said drive shaft having an outer race with plural outer raceways formed in an inner peripheral wall thereof, a shaft member disposed for rotation relative to the outer race and defining a like plural number of inner raceways formed in an outer peripheral wall of the shaft member in radial registration with the corresponding outer raceways, and a multiplicity of rolling elements arranged between the inner raceways and the corresponding outer raceways, respectively, the improvement wherein said shaft member comprises:

- a large-diameter bearing portion with the plural inner raceways formed in an outer peripheral wall thereof;
- a small-diameter impeller shaft portion extending from one end of the large-diameter bearing portion;
- a small-diameter pulley shaft portion; and
- a continuously-connecting portion extending between an opposite end of the large-diameter bearing portion and a proximal

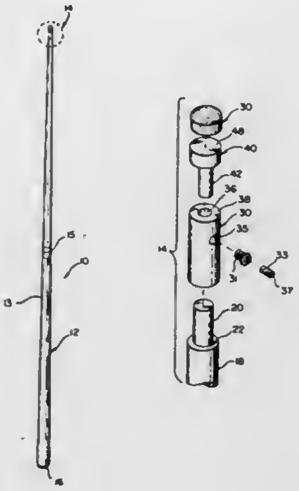
end of the small-diameter pulley shaft portion, said continuously-connecting portion presenting a curved peripheral surface with circular arcs in tangential directions of which an outer peripheral wall of the small-diameter pulley portion extends;

wherein the ratio (d/D) of the diameter (d) of the small-diameter pulley shaft portion to the diameter (D) of the large-diameter bearing portion is less than 0.88.

5,462,490

BILLIARD CUE WITH IMPROVED TIP CONFIGURATION

Roger P. Donwen, 8752 Douglas Cir., Helena, Mont. 59601
Filed Dec. 5, 1994, Ser. No. 349,326
Int. Cl.^{6} A63D *15/12*
U.S. Cl. 473—49 **6 Claims**



1. A billiard cue shaft tip assembly for attachment to a shaft that has a tip end provided with an elongated axial tenon, the tip assembly comprising a ferrule adapted to be secured to the shaft tip end tenon; and a plurality of different size tip inserts, each having an elongated axial tenon adapted to be releasably inserted into said ferrule in juxtaposition with said shaft tip end tenon, each said tip insert further having a head provided with a transverse cue tip pad supporting surface, said head having a lower surface adapted to contact an upper end of said ferrule so as to completely transfer cue ball impact forces from said tip insert directly into said ferrule, said ferrule being so constructed and arranged with respect to said tip inserts that the juxtaposed end of said tip insert tenon and said shaft tip end tenon are spaced from one another a short distance whereby no cue ball impact forces can be transferred between them; each said tip insert having a head providing a cue tip pad supporting surface of a different size for receiving a different sized cue tip pad whereby said tip assembly can provided a variety of cue tip pads for quick and convenient selection and mounting to a single billiard cue by means of said ferrule being secured to said shaft tip end tenon.

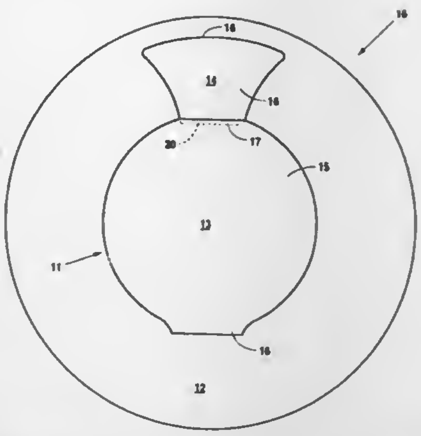
5,462,491

BOWLING BALL WITH WEIGHT BLOCK

Wayne D. MacDonald, San Antonio, Tex., assignor to Columbia Industries, Inc., San Antonio, Tex.
Continuation of Ser. No. 183,141, Jan. 18, 1994, abandoned. This application Sep. 8, 1994, Ser. No. 302,387
Int. Cl.^{6} A63B *37/06*
U.S. Cl. 473—126 **6 Claims**

1. A bowling ball, comprising:

a substantially spherical core body;



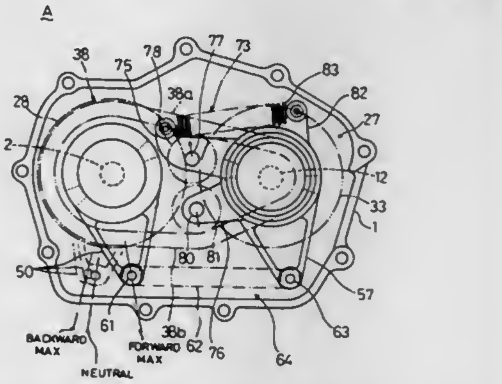
a weight block having a non-linearly changing diameter connected to said core body, said weight block formed integrally in the shape of a truncated spherical member and a substantially frustro-conical member; and

a coverstock surrounding said substantially spherical core body and said weight block.

5,462,492

CONTINUOUS SPEED-SHIFTING DEVICE

Hirofumi Miyata; Yoshihiro Akahoshi; Eiichiro Ikeda, and Yutaka Furukawa, all of Kobe, Japan, assignors to Bando Chemical Industries, Ltd., Kobe, Japan
Filed Oct. 5, 1994, Ser. No. 318,552
Claims priority, application Japan, Jan. 6, 1993, 5-250835; Jan. 6, 1993, 5-250842; Jan. 6, 1993, 5-250846; Jan. 6, 1993, 5-250847; Jan. 6, 1993, 5-250864; Jan. 6, 1993, 5-250865
Int. Cl.^{6} F16H *63/00*
U.S. Cl. 474—38 **17 Claims**



1. A continuous speed-shifting device comprising:

first and second rotary shafts arranged in parallel with each other;

a variable speed pulley mechanism having a pair of variable speed pulleys in which a fixed sheave and a movable sheave are supported on respective outer peripheries of the rotary shafts so as to be opposed to each other, a belt wound between both the variable speed pulleys, a pair of driving mechanisms each of which is disposed on the back side of the movable sheave of each variable speed pulley and varies a diameter at which the belt is wound around the variable speed pulley by moving the movable sheave toward and away from the fixed sheave, a linkage mechanism for varying a speed ratio between both the variable speed pulleys by linking both the driving mechanisms to each other so as to vary the diameters at which the belt is wound around both the variable speed pulleys in a direction opposite to each other, a switching operation part for operating the linkage mechanism, and a tension mechanism for pressing a slack side span of the belt between both the variable speed pulleys so as to generate a tension larger than that generating in accordance with the speed ratio between the variable speed pulleys thereby generating a belt thrust; and

a differential gear mechanism which has first, second and third gear elements connected to one another and in which the first gear element is connected to the first rotary shaft and the second gear element is connected to the second rotary shaft,

wherein one of the first rotary shaft and the third gear element is an input part while the other is an output part,

the output part is shifted in speed in such a manner as to be switched into a normal rotating state, a neutral state or a reverse rotating state with respect to the input part by switching operation of the switching operation part,

the output part is forced so as to be shifted into the neutral state by a balance between the thrusts to the belt by both the variable speed pulleys of the variable speed pulley mechanism, and

in higher use frequency one of the normal rotating state and the reverse rotating state, at least one of a gear ratio of the differential gear mechanism and a gear ratio between the differential gear mechanism and a gear element meshed with the differential gear mechanism are set in order that the rotation speed of the first gear element is always higher than the rotation speed of the second gear element.

5,462,493

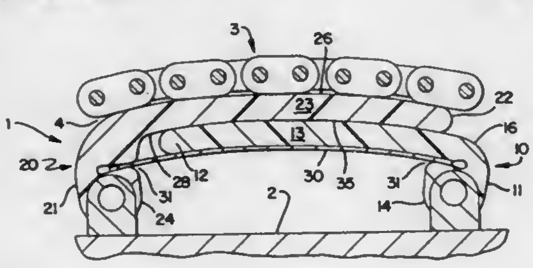
DUAL BLADE CHAIN TENSIONER WITH DAMPING

Roger T. Simpson, Ithaca, N.Y., assignor to Borg-Warner Automotive, Inc., Sterling Heights, Mich.

Filed Nov. 2, 1994, Ser. No. 333,267

Int. Cl.^{6} F16H *7/08*

U.S. Cl. 474—111 **19 Claims**



1. A chain tensioner comprising:

a first shoe attached to a support surface, said first shoe having an upper and lower surface;

a second shoe pivotally attached to a support surface, said second shoe having an upper and lower surface, said upper surface of said second shoe being positioned to impart tension to a chain, said second shoe lower surface overlapping a portion of the supporting surface of first shoe; and

a blade spring engaging the first shoe, and imparting a tension to said first shoe.

5,462,494

BELT TENSIONER AND METHOD OF MAKING THE SAME

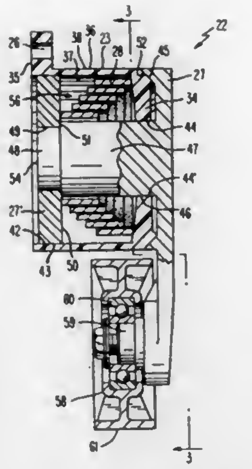
Jan N. Rogalla, Everton, Mo., assignor to Dayco Products, Inc., Dayton, Ohio

Filed Oct. 20, 1994, Ser. No. 326,618

Int. Cl.^{6} F16H *7/08*

U.S. Cl. 474—135 **20 Claims**

1. In a tensioner for a power transmission belt that is adapted to be operated in an endless path, said tensioner comprising a support member for being fixed relative to said belt, a belt engaging arm movably carried by said support member, and a spiraled spring having an outer end interconnected to said support member and having an inner end interconnected to said belt engaging arm for urging said belt engaging arm relative to said support member and against said belt with a force to tension said belt, said support member having a pivot opening passing therethrough, said belt engaging arm having a pivot part thereof rotatably disposed in said pivot opening so as to rotate therein, the improvement wherein said support member has an internal wall means provided with an abutment means extending inwardly therefrom and cooperating therewith to define an angled and closed ended slot means therebetween that receives said outer end of said spring therein to interconnect said outer end of said spring to said support member.



5,462,495

ROLLER BELT ARRANGEMENT FOR CATERPILLAR TRACK-TYPE VEHICLES

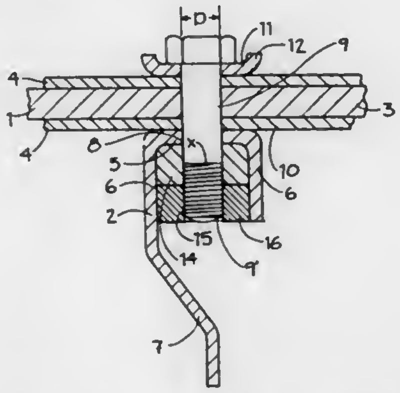
Arnold Jäger, Gehrbergsweg 6, D-31303 Burgdorf, Germany

Filed Sep. 30, 1994, Ser. No. 316,238

Claims priority, application Germany, Jan. 1, 1993, 43 33 602.7

Int. Cl.^{6} F16G *1/00*

U.S. Cl. 474—209 **14 Claims**



1. In a roller belt arrangement, for a caterpillar track-type vehicle, having one or more inextensible belts that extend parallel to one another and to which transversely extending driver or gripper means are secured with the aid of securing means in the form of bolts, screws or rivets that extend through said belts and a base of said driver or gripper means, said base having a U-shaped cross-sectional shape, including two legs that extend essentially perpendicular to said belts and a crosspiece that connects said legs and extends parallel to a plane of said belts and is adapted to rest thereagainst, the improvement wherein:

an elastomeric cushion member is provided that rests against said crosspiece on a side thereof remote from said belts; and

an abutment member is disposed on an end of said securing means facing said driver or gripper means, with said cushion member being disposed between said abutment member and said crosspiece of said base of said driver or gripper means.

5,462,496

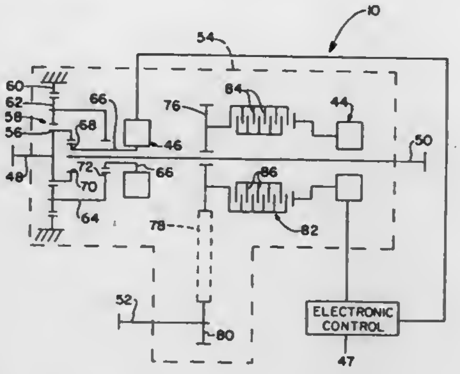
CLUTCH ACTUATING DEVICE FOR USE IN A VEHICLE DRIVETRAIN SUBASSEMBLY

Wesley M. Dick, Fort Wayne, Ind.; David C. Reuter, Saline, Mich., and Joseph A. Dick, Fort Wayne, Ind., assignors to Dana Corporation, Toledo, Ohio

Filed Jul. 12, 1994, Ser. No. 273,722

Int. Cl.^{6} F16H *37/06*

U.S. Cl. 475—204 **21 Claims**



1. A clutch actuating device for use in a vehicle drivetrain subassembly having a clutch, said clutch actuating device comprising:

a first rotating member which is coupled to a rotatable drive member of the vehicle drivetrain subassembly for rotation therewith;

a second rotating member which is free to rotate relative to the drive member, said first and second rotating members engaging one another so as to cause axial translation of said second member relative to said first member in response to relative rotation between said first and second members;

gear means connected to at least one of said first and second rotating members for differentially driving said first and second rotating members;

first and second pilot clutches, each of said pilot clutches comprising at least one rotatable plate, wherein said at least one rotatable plate of at least one of said first and second pilot clutches is connected to said gear means;

means for selectively activating said first pilot clutch and said second pilot clutch so as to selectively ground said first and second pilot clutches, wherein activating one of said first and second pilot clutches causes said second rotating member to translate axially relative to said first rotating member so as to load the drivetrain subassembly clutch, and wherein activating the other of said first and second pilot clutches causes said second rotating member to translate axially relative to said first rotating member so as to unload the drivetrain subassembly clutch.

5,462,497

CONTROLLABLE PARALLEL AXIS DIFFERENTIAL

Joseph E. Cilano, 6595 N. Lake Rd., Bergen, N.Y. 14416

Continuation-in-part of Ser. No. 282,622, Jul. 29, 1994, which is a continuation-in-part of Ser. No. 58,480, May 6, 1993, Pat. No. 5,415,599. This application Sep. 1, 1994, Ser. No. 299,494

Int. Cl.^{6} F16H *1/42*

U.S. Cl. 475—252 **13 Claims**

1. A parallel-axis gear differential comprising:

a housing rotatable in forward and reverse drive directions about a common axis of rotation of a pair of drive shafts;

first and second side gears positioned within said housing for receiving ends of the respective drive shafts for rotation therewith about said common axis;

first and second pairs of planet gears positioned within said housing in engagement with said side gears for rotation about respective axes that extend parallel to said common axis of rotation;

each of said pairs of planet gears including a leading planet gear member and a following planet gear member;

said leading planet gear member being angularly advanced in said forward drive direction about said common axis with respect to said following planet gear member of each pair;

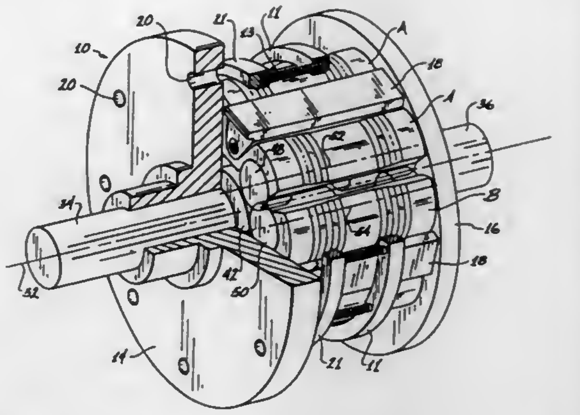
a first toggle having first and second bearing surfaces and being mounted in said housing between said first and second pairs of planet gears;

said first bearing surface of the first toggle rotationally supporting said leading member of the first pair of planet gears;

said second bearing surface of the first toggle rotationally supporting said following member of the second pair of planet gears;

said first toggle being pivotable about a first pivot axis that extends parallel to said planet gear axes for transmitting a gear reactionary force between said leading and following members of the first and second pairs of planet gears; and,

means for controlling said first toggle and for controlling the amount of said gear reactionary force transmitted between said leading and following members of the first and second pairs of planet gears.



5,462,498

DEVICE FOR RELATIVE ANGULAR SETTING OF TWO UNITS, PREFERABLY THE INCLINATION OF A VEHICLE-SEAT BACK REST

Lennart Lindblad, Vårgårda, Sweden, assignor to Linvent AB, Vargarda, Sweden

PCT No. PCT/SE92/00334, § 371 Date Dec. 20, 1993, § 102(e) Date Dec. 20, 1993, PCT Pub. No. WO92/20548, PCT Pub. Date Nov. 26, 1992

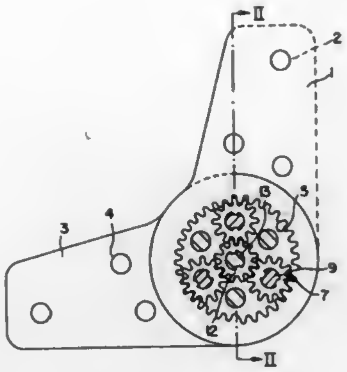
PCT Filed May 20, 1992, Ser. No. 142,348

Claims priority, application Sweden, May 21, 1991, 9101515

Int. Cl.^{6} B60N *2/22*

U.S. Cl. 475—342 **7 Claims**

1. A device for relative angular setting of two units, preferably the inclination of a back rest of a seat, particularly a vehicle seat, comprising components that are interconnected in pairs for mutual rotational movement, said components preferably being separate fitting components which are arranged to be associated with the back rest and a seat face, respectively, of the vehicle seat, characterized in that each component of said pair of integrated components is formed with a gear rim, each with a different number of teeth, said rims being positioned adjacent one another in mutual concentric relationship with the rim teeth meshing with a number of planet wheel pairs, wherein each pair comprises two planet wheels, said wheels likewise being positioned adjacent one another



in mutual concentric relationship and being non-rotationally interconnected, the planet wheels being supported by a common support member, and an actuator arranged to move the planet wheels along their respective gear rim, whereby the rolling of the planet wheel/wheels in mesh with the associated gear rim causes the two gear rims and the associated components of the joint to turn with respect to one another and consequently the back rest of the vehicle seat to pivot with respect to the seat face.

5,462,499

METHOD FOR CONTROLLING THE SHIFTING COMFORT IN MOTOR VEHICLES HAVING AN AUTOMATIC TRANSMISSION

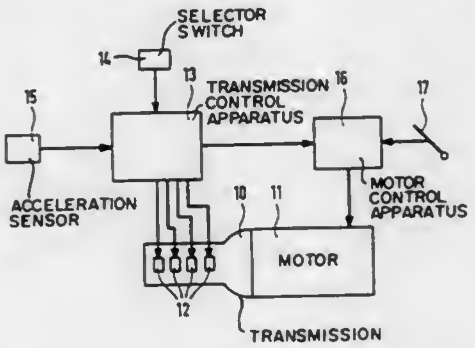
Wolfgang Bullmer, Bietigheim-Bissingen, and Kurt Neuffer, Stuttgart, both of, Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Nov. 10, 1993, Ser. No. 149,955

Claims priority, application Germany, Nov. 10, 1992, 42 37 878.8

Int. Cl.⁶ F16H *59/48*

U.S. Cl. 477—120 **12 Claims**



1. A method for controlling the gear-shifting comfort in a motor vehicle having an automatic transmission, the automatic transmission having pressure controllers for controlling clutches effecting the gear-shifting operations of the transmission, the clutches transmitting torques and defining torque curves, the method comprising the steps of:

- storing preset values for the torques and/or torque curves for said clutches in a characteristic field in dependence upon the particular gear-shifting operations and the magnitudes of a particular driving speed and/or rpm of the engine;
- detecting the actual acceleration B_{act} of the motor vehicle by utilizing an acceleration sensor;
- providing a desired acceleration B_{des} as a guide quantity for torque control of said clutches to obtain corrected preset values for said clutches; and,
- storing said corrected preset values for said clutches in said characteristic field.

5,462,500

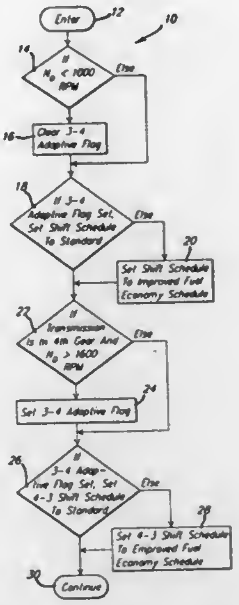
AUTOMATIC TRANSMISSION WITH ADAPTIVE SHIFT SCHEDULE

Howard L. Benford, Bloomfield Hills, and Maurice B. Leising, Clawson, both of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Filed May 21, 1993, Ser. No. 65,877

Int. Cl.⁶ B60K *41/10*

U.S. Cl. 477—154 **2 Claims**


Enter
12
10
14
If N₀ < 1000 RPM
Else
16
Clear 3-4 Adaptive Flag
18
If 3-4 Adaptive Flag Set, Set Shift Schedule To Standard
Else
20
Set Shift Schedule To Improved Fuel Economy Schedule
22
If Transmission Is In 4th Gear And N₀ > 1600 RPM
Else
24
Set 3-4 Adaptive Flag
26
If 3-4 Adaptive Flag Set, Set 4-3 Shift Schedule To Standard
Else
28
Set 4-3 Shift Schedule To Improved Fuel Economy Schedule
30
Continue

1. In a transmission system associated with an engine, the transmission system including an input member, an output member, a gear assembly for changing the ratio of torque between the input member and the output member, input sensors providing input signals indicative of predetermined conditions, a controller having memory for processing and storing the input signals and providing output signals to shift the gear assembly, a method of adaptively scheduling upshifts and downshifts of the gear assembly, said method comprising the steps of:

- checking a time the transmission has remained in a particular gear;
- shifting the gear assembly according to a first shift schedule when the time corresponds to a preset criteria;
- rechecking the time the transmission has remained in a particular gear;
- shifting the gear assembly according to a second shift schedule when said time corresponds to a second preset condition.

5,462,501

METHOD OF ACTUATING AN AUTOMATIC TRANSMISSION

Wolfgang Bullmer, Bietigheim-Bissingen; Klemens Kronenberg, Korntal-Münchingen, and Herbert Ott, Grosselfingen, all of, Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

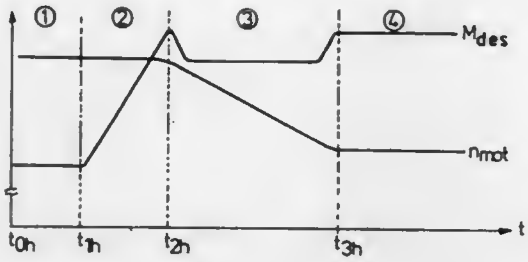
Filed Apr. 11, 1994, Ser. No. 225,547

Claims priority, application Germany, Apr. 10, 1993, 43 11 921.2

Int. Cl.⁶ F16H *59/74*

U.S. Cl. 477—155 **23 Claims**

1. A method for adjusting a hydraulic pressure actuating at least one clutch of an automatic transmission during a gear change, the automatic transmission having a pressure controller and coacting with a motor such as the drive motor of a motor vehicle, the method comprising the step of determining the pressure to be supplied by said pressure controller in dependence upon a pregiven motor desired torque (M_{des}).

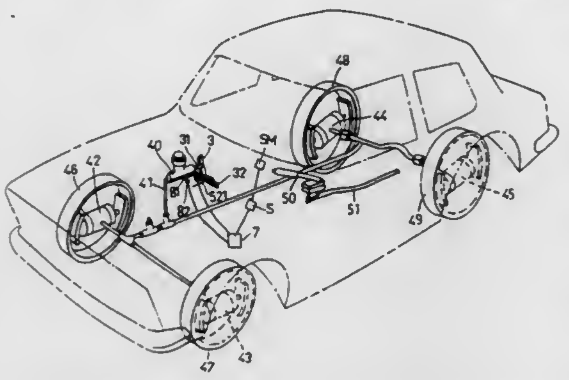


5,462,502
BRAKE MECHANISM FOR AN AUTOMOBILE

Chien-Hung Lin, No.113, Chung-Shan Rd., Fan-Chang Tsun, Chang-Chih Hsiang, Ping-Tung Hsien, Taiwan, Prov. of China

Filed Jun. 23, 1994, Ser. No. 264,627
Int. Cl.^{6} B60K ***41/20***

U.S. Cl. 477—197 **3 Claims**



1. A brake mechanism for use in an automobile with a gas pedal and a speedometer, said brake mechanism being retainable releasably in a braking state and comprising:

a fixed base member which is disposed securely in said automobile and which has a front end and a rear end to be disposed adjacent to a body part of said automobile, said base member being formed with a positioning plate between said front and rear ends, and a pivot pin posterior to said positioning plate;

a brake pedal unit having an upper end connected pivotally to said pivot pin;

a torsional spring which is provided on said pivot pin and which biases said brake pedal unit to abut normally against said positioning plate;

a retaining assembly to be provided on one of said body part of said automobile and said brake pedal unit, said retaining assembly including: an electromagnet; a motor unit located on one side of said electromagnet, said motor unit having a driving shaft with a first end portion extending away from said electromagnet and a second end portion extending toward said electromagnet; a sheave mounted securely on said first end portion of said driving shaft; a string unit having a first end portion connected to said sheave and a second end portion to be secured to the other one of said body part of said automobile and said brake pedal unit; and a permanent magnet which is sleeved on said second end portion of said driving shaft between said motor unit and said electromagnet and which is movable along said second end portion;

an electrical control means connected electrically to said electromagnet and said motor unit, said electrical control means normally deactivating said motor unit and said electromagnet to permit said electromagnet to attract normally with said permanent magnet so as to prevent rotation of said driving shaft to prevent correspondingly winding of said string unit on said sheave;

a detector connected electrically to said control means and operatively associated with said speedometer for detecting speed of said automobile;

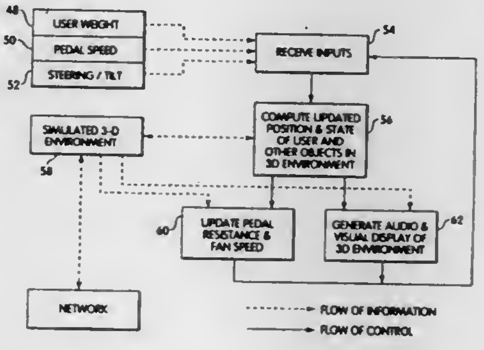
a first switching means connected electrically to said control means via said detector and operatively associated with said brake pedal unit, said first switching means being activated when said brake pedal unit pivots away from said positioning plate due to application of pressure on said brake pedal unit, said control means being enabled in order to activate said electromagnet so as to repel said permanent magnet and in order to activate said motor unit to rotate said driving shaft in a first direction so as to wind said string unit on said sheave when said first switching means is activated and said detector has detected that said speed of said automobile is zero for a predetermined time interval, thereby placing said brake mechanism in said braking state; and

a second switching means connected electrically to said control means and activable so as to release said brake mechanism from said braking state, said second switching means enabling said control means in order to activate said electromagnet so as to repel said permanent magnet and in order to activate said motor unit to rotate said driving shaft in a second direction opposite to said first direction so as to unwind said string unit when said second switching means is activated.

5,462,503
INTERACTIVE EXERCISE APPARATUS

Michael H. Benjamin, Quincy; Aaron F. Bobick; Harvey A. Koselka, both of Newton, and W. Thatcher Ulrich, Boston, all of Mass., assignors to CyberGear, Inc., Cambridge, Mass.
Continuation of Ser. No. 12,305, Feb. 2, 1993, abandoned.
This application Jan. 18, 1995, Ser. No. 375,166
Int. Cl.^{6} A63B ***69/00***

U.S. Cl. 482—4 **12 Claims**


48
50
52
USER WEIGHT
PEDAL SPEED
STEERING / TILT
RECEIVE INPUTS
54
SIMULATED 3-D ENVIRONMENT
58
COMPUTE UPDATED POSITION & STATE OF USER AND OTHER OBJECTS IN 3D ENVIRONMENT
56
UPDATE PEDAL RESISTANCE & FAN SPEED
60
GENERATE AUDIO & VISUAL DISPLAY OF 3D ENVIRONMENT
62
NETWORK
FLOW OF INFORMATION
FLOW OF CONTROL

1. An exercise apparatus comprising:

a support structure for supporting a user;

an exercise mechanism for providing exercise to the user supported by the support structure;

a steering mechanism proximal to the support structure;

a processor for generating an interactive simulated environment and monitoring user manipulation of the exercise mechanism and the steering mechanism to determine user position in the simulated environment; and

a display system spaced from the user and providing a visual display of the simulated environment and user position in the simulated environment;

the processor being configured to enable the user to (i) travel substantially unrestricted throughout the simulated environment by manipulating the exercise mechanism and the steering mechanism, (ii) spontaneously modify user's course while traveling within the simulated environment, and (iii) participate in user selectable activities within the simulated environment.

5,462,504

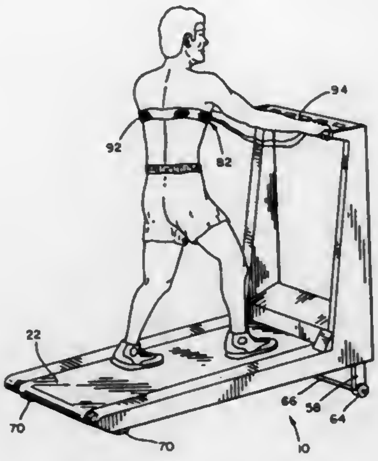
FITNESS APPARATUS WITH HEART RATE CONTROL SYSTEM AND METHOD OF OPERATION

Frank R. Trulaske, St. Louis, Mo., and Phil M. Singer, Clarendon Hills, Ill., assignors to True Fitness Technology Inc., O'Fallon, Mo.

Filed Feb. 4, 1994, Ser. No. 192,407

Int. Cl.^{6} A63B ***21/005***

U.S. Cl. 482—7 **20 Claims**



1. A method of operating a fitness apparatus to control the heart rate of a user in accordance with a predetermined scheduled heart rate, comprising the steps of:

receiving user information including a predetermined upper resistance level of a first resistance mechanism;

sensing the heart rate of the user;

comparing the sensed heart rate with the predetermined scheduled rate; and

controlling the heart rate of the user by adjusting the resistance level of the first resistance mechanism with respect to the resistance level of a second resistance mechanism, wherein:

1) if the sensed heart rate is slower than the scheduled rate and the first resistance mechanism is not at the user's predetermined upper resistance level, increasing the resistance level of the first resistance mechanism; or

2) if the sensed heart rate is slower than the scheduled rate and the first resistance mechanism is at the user's predetermined upper resistance level, increasing the resistance level of the second resistance mechanism.

5,462,505

PORTABLE INFLATABLE STRUCTURE

Rodney L. Blair, 11009 Dapple Way, Bakersfield, Calif. 93312, and Philip G. Chauvet, 6644 Rippling Brook Dr., Salem, Oreg. 97301

Continuation-in-part of Ser. No. 134,693, Oct. 12, 1993, abandoned. This application Dec. 13, 1994, Ser. No. 354,359

Int. Cl.^{6} A63B ***5/11; 9/00;*** **G10D** ***7/00***

U.S. Cl. 482—27 **6 Claims**

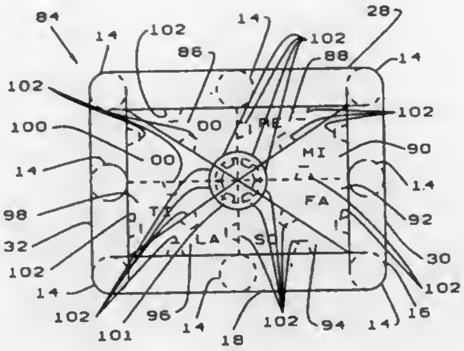
1. An inflatable structure comprising:

an inflatable base forming a trampoline-type floor having a plurality of chambers arranged contiguously,

an inflatable framework projecting upwardly from said base,

a plurality of netting panels extending between adjacent portions of said framework to prevent a child from inadvertently bouncing out of said structure and said base including;

a plurality of sound-generating air valves each generating a different musical note and connected to pass air between adjacent ones of said chambers to play respective musical notes as a user steps on respective ones of said chambers.



5,462,506

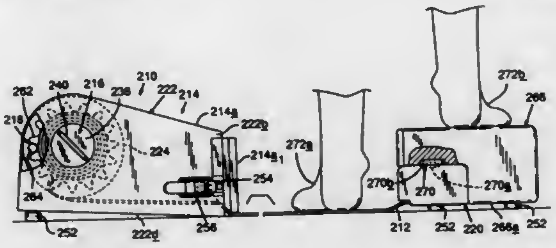
LATERAL MOVEMENT TRAINER SELECTIVELY POSITIONABLE FOR STORAGE OR USE

Max C. Markland, Gresham, Oreg., assignor to Joshua Group Ltd., Portland, Oreg.

Filed Sep. 24, 1992, Ser. No. 951,664

Int. Cl.^{6} A63B ***22/00***

U.S. Cl. 482—51 **18 Claims**



11. A lateral-movement trainer that is selectively positionable for storage or use, comprising:

an elongate slidesheet with first and second ends;

an enclosure dimensioned for substantially containing the slidesheet;

extension/retraction structure connected to the enclosure, and being selectively actuable to move the slidesheet to either a retracted position for storage, or an extended position for use in connection with lateral-movement training;

wherein the first end of the slidesheet is coupled to bumper structure;

wherein the enclosure includes an outer surface with a bumper region positioned so that it substantially opposes the bumper structure when in the slidesheet is in the extended position, thereby allowing a user to perform lateral-movement training when the slidesheet is in the extended position by sliding laterally on it in opposite directions between the bumper structure and bumper region; and

wherein the enclosure is also dimensioned to contain the bumper structure, and wherein the bumper region is detachably removable from the enclosure to open it and allow the slidesheet and bumper structure to be removably placed therein.

5,462,507

APPARATUS FOR DOCKING AN EXERCISE MACHINE

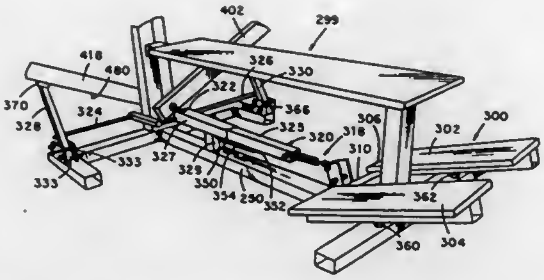
Raymond L. Nichols, Sr., and Raymond L. Nichols, II, both of Cleveland, Tenn., assignors to Southern Xercise, Inc., Cleveland, Tenn.

Filed Feb. 7, 1994, Ser. No. 192,452

Int. Cl.^{6} A63B ***21/06***

U.S. Cl. 482—104 **6 Claims**

1. Apparatus for docking of a movable component or components of an exercise machine wherein the movable component or components are biased toward a docked position thereof comprising:



support means providing for mounting of the movable component or components of the exercise machine,

dock means pivotally mounted on said support means in position with respect to the movable component or components of the exercise machine to limit the movement of the component or components against the bias of the movable component or components, said dock means being movable between docking and nondocking positions with respect to the movable components or components, and being in frictional engagement with the movable component or components when in its docking position and out of frictional engagement with the movable component or components when in its nondocking position,

activator means mounted on said support means and in such proximity to said dock means as provides for an initial physical movement of said activator means to initiate only the possibility of movement of said dock means away from its docking position,

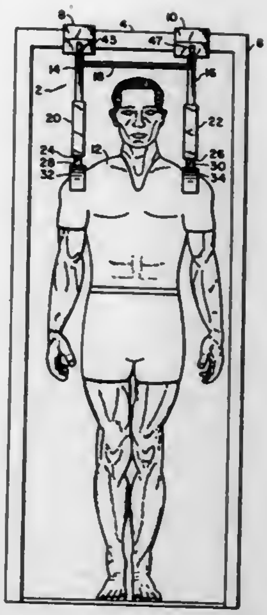
connector mechanism means interposed between said activator means and said dock means, said connector mechanism means including a resilient extensible member having opposite ends, one of said ends being connected to said activator means and the other of said ends being connected to said connector mechanism means whereby physical movement of said activator means serves to extend said extensible member and develop stored energy therein, whereupon the initial physical movement of said activator means is converted into a physical bias of said connector mechanism means toward a position which causes said connector mechanism means to urge said dock means away from its docking position and said physical bias is transmitted to said dock means, the degree of said physical bias transmitted to said connector mechanism means being limited to a value which is less than that bias which is sufficient to permit the connector mechanism means to move said dock means away from its docking position so long as said dock means is in frictional engagement with the movable component or components but which is sufficient to move said dock means to its nondocking position when said dock means is not in frictional engagement with the movable component or components.

5,462,508
CALF CRUNCHER EXERCISE EQUIPMENT

Robert J. Schiavone, 410 Union Valley Rd., Mahopac, N.Y. 10541

Filed Feb. 15, 1995, Ser. No. 388,946
Int. Cl.^{6} A63B *21/02*
U.S. Cl. 482—122 **6 Claims**

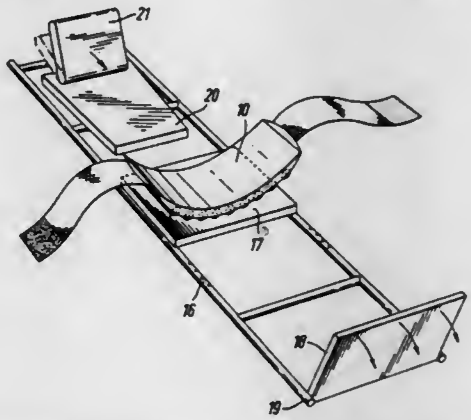
1. An exercise apparatus for strengthening leg and foot muscles, said apparatus comprising a pair of laterally spaced clamping means adapted for adjustably secured to the upper edge of a door frame opening, shaft means depending downwardly from each of said clamping means and being connected together by a horizontal bar means, said depending shaft means having downwardly extending sliding shaft means at their lower ends which said sliding shaft means normally resting in an extended downward position, adjustable tension means connected to said sliding shaft means for resisting upward movement of said sliding shaft means, lower ends of said sliding shafts having downwardly extending concavely curved shoulder engaging means adapted to fit over the shoulders of a user standing below said apparatus and to be pushed upwardly by said user's upward movement, said upward movement being resisted by said tension means on said sliding shafts.



5,462,509
WAIST, HIP, OR SHOULDER EXERCISE DEVICE ROLLED BY THE USER

James F. Lister, Forest Lodge, New Barn Lane, Buriton, Hampshire, United Kingdom

Filed Aug. 8, 1994, Ser. No. 287,246
Claims priority, application United Kingdom, Aug. 6, 1993, 9316382
Int. Cl.^{6} A63B *21/22*
U.S. Cl. 482—132 **11 Claims**



1. An exercise device adapted to be fastened laterally around a body of a user at hip, waist or shoulder level comprising:

a elongated body portion adapted to contact the body of the user, said body portion including first and second ends that are spaced in a lateral direction;

means for fastening said body portion to a user at hip, waist or shoulder level, said fastening means extending laterally outwardly from the first and second ends of said body portion;

means to reduce or ease friction between the device and a floor or wall when the exercise device is in use, the friction reducing means being held by the body portion so that, in use, the friction reducing means is spaced from the body of the user, said friction reducing means including a plurality of laterally spaced rollers rotatably attached to said body portion for rotation about respective axes which are substantially perpendicular to said lateral direction.

5,462,510

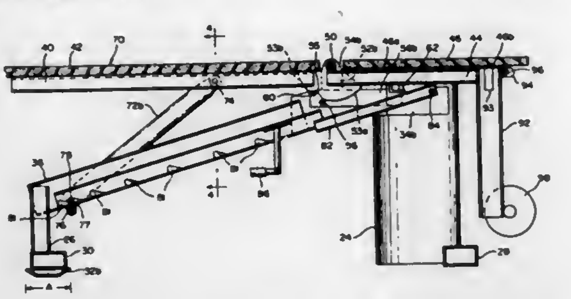
SINGLE EFFORT, DOUBLE ACTION EXERCISE BENCH

A. Buell Ish, III, Carnation, Wash., assignor to Vectra Fitness, Inc., Redmond, Wash.

Filed Aug. 1, 1994, Ser. No. 283,578

Int. Cl.⁶ A63B *26/00*

U.S. Cl. 482—142 **9 Claims**



1. An adjustable elevation bench for use in exercising comprising:

at least one supporting member connected to a longitudinal member wherein an end portion of the at least one supporting member is in contact with a bench supporting surface;

a torso supporting assembly pivotal at a proximal end about the longitudinal member at a first pivot point and having a distal end generally opposite thereto;

a seat supporting assembly pivotal at a proximal end about the longitudinal member at a second pivot point and having a distal end generally opposite thereto;

at least one strut to support the distal portion of the torso supporting assembly, the at least one strut being engagable with a releasable locking mechanism wherein the releasable locking mechanism selectively permits variable inclination and declination from the horizontal of the torso supporting assembly;

a lever assembly pivotally mounted to the bench having a cam follower portion at a first end and a distal seat supporting portion at a second end; and

at least one cam plate fixedly attached to the proximal end of the torso supporting assembly and in engaging contact with the cam follower portion of the lever assembly wherein the at least one cam plate has a valley portion adjacent to at least one arcuate portion

whereby the torso supporting assembly and the seat supporting assembly are in a first relative configuration when the cam follower portion of the lever assembly is located in the valley portion, and the torso supporting assembly and the seat supporting assembly are in at least a second relative configuration when the cam follower portion of the lever assembly is located out of the valley portion.

5,462,511

TOOL CHANGER CONFIGURED FOR USE WITH MACHINE TOOLS

Paul C. Sheldon, Mequon, and Richard J. Loerch, Greenfield, both of Wis., assignors to Giddings & Lewis, Inc., Fond du Lac, Wis.

Filed Jul. 14, 1994, Ser. No. 275,236

Int. Cl.⁶ B23Q *31/157*

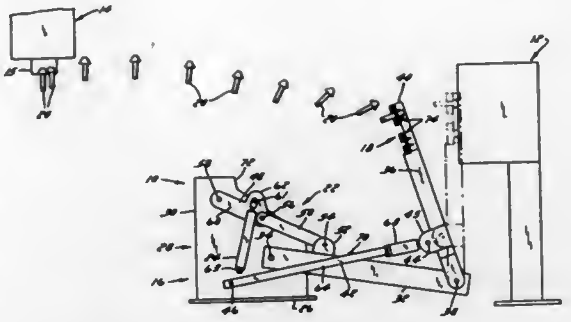
U.S. Cl. 483—1 **20 Claims**

1. A system for moving a tool through space along a spatially complex path, comprising:

a storage structure configured to hold a plurality of tools;

a machine tool configured to receive and hold the tool; and

a tool changer mechanism having:



a rigid framework;

a linkage assembly pivotably mounted on the rigid framework, the linkage assembly including a plurality of pivotably interconnected links, the plurality of pivotably interconnected links being pivotably connected to the rigid framework in at least three places;

a tool holder mounted on a tool transfer link of the plurality of interconnected links; and

an actuator connected to an actuator link of the plurality of interconnected links, wherein movement of the actuator link causes the linkage assembly to move the tool holder along the spatially complex path.

5,462,512

PRINTED CIRCUIT BOARD WORKING MACHINE

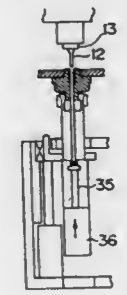
Yasunori Hiroshima, and Kenji Kondo, both of Tokyo, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Sep. 19, 1994, Ser. No. 305,928

Claims priority, application Japan, Sep. 20, 1993, 5-233504

Int. Cl.⁶ B23Q *31/157*

U.S. Cl. 483—57 **5 Claims**



1. A printed circuit board working machine comprising:

a board plate provided with an opening;

a working table which is disposed above said board plate and on which a printed circuit board substrate is positioned and fixed;

a spindle which is disposed above said working table to be movable horizontally and vertically and to which a predetermined cutting tool is detachably mounted;

a chuck mounted to said spindle so as to detachably hold a predetermined cutting tool to the spindle;

a drive means for driving said spindle horizontally and vertically;

a drive control means for controlling the movement of said spindle in accordance with a predetermined cutting data;

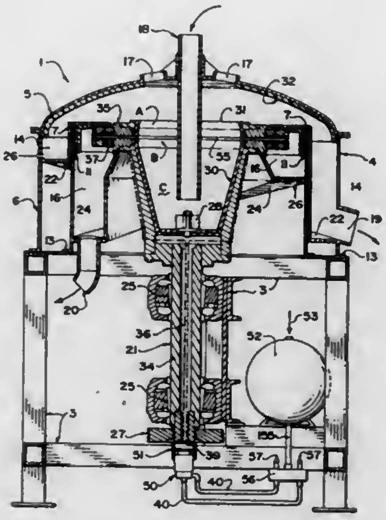
a tool store for holding a plurality of tool holders to which cutting tools are held, respectively, said tool store having a portion disposed below the location of said working table;

a tool store control means for positioning said tool store to a predetermined position;

a tool exchanging means for exchanging the predetermined cutting tool held by said chuck with a cutting tool held by said tool holder at a portion corresponding to said opening of the board plate; and a tool holder elevating mechanism for raising a predetermined tool holder to a predetermined position at the cutting tool exchanging time.

5,462,513
CONTINUOUS DISCHARGE CENTRIFUGE

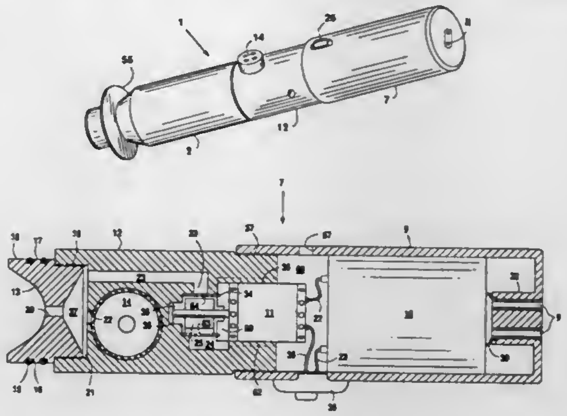
Steven A. McAlister, 9807 - 196 A Street, Langley, British Columbia, Canada
PCT No. PCT/CA93/00009, § 371 Date Jul. 13, 1994, § 102(e) Date Jul. 13, 1994, PCT Pub. No. WO93/13864, PCT Pub. Date Jul. 22, 1993
PCT Filed Jan. 13, 1993, Ser. No. 256,501
Claims priority, application Canada, Jan. 13, 1992, 2059208-7
Int. Cl.^{6} B04B *1/16*
U.S. Cl. 494—56 13 Claims



1. A concentrator for separating particulate material of higher specific gravity from particulate material of lower specific gravity, comprising:
(a) a hollow drum (23) having an open end and an inner surface;
(b) means (25) for rotatably supporting said drum on an axis;
(c) drive means (9, 27) for rotating said drum about said axis; and
(d) material supply means (18) to deliver said particulate material into tie end of said drum spaced from said open end;
wherein said interior surface of said hollow drum (23) comprises an outwardly inclined migration zone (C), a retention zone (B) above said migration zone which is substantially parallel to said axis of rotation and an inwardly inclined lip zone (A) above said retention zone (B), where said hollow drum comprises an open interior providing unobstructed delivery of said particulate material to said migration zone (C) of said interior surface and where the respective lengths of said migration, retention and lip zones and the relative degrees of inclination of said migration and lip zones are selected to provide a sufficient component of force on said particulate, material to expel said lighter particulate material from said drum and to permit said heavier particulate material to be retained in said retention zone; characterized in that said concentrator further comprises:
e) a plurality of cavities (70) extending outwardly of said retention zone (B) with respect to the axis of rotation of said hollow drum, said cavities. (70) each having an inlet (55) and an outlet (68) located outwardly from said inlet, the inlets (55) of said cavities communicating with said retention zone (B), and wherein each said cavity is a hopper comprising walls having slope angles sufficiently steep to provide mass flow; and
f) flow controlling means (37) for controlling the flow of material from said outlets (68) of said cavities (70), said flow controlling means being adapted for alternately retaining or releasing said material.

5,462,514
APPARATUS FOR AIDING ERECTIONS IN MALES

Jesse Harris, 3006 Mayfair, San Antonio, Tex. 78217
Continuation of Ser. No. 993,715, Dec. 15, 1992, abandoned.
This application May 4, 1994, Ser. No. 237,245
Int. Cl.^{6} A61F *5/41*
U.S. Cl. 600—38 17 Claims

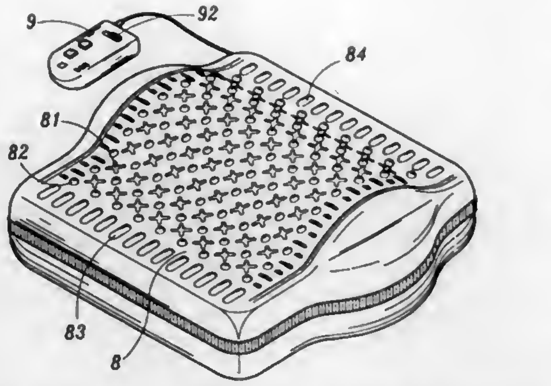


1. A vacuum and constriction apparatus for aiding male potency, comprising:
an elongated evacuation tube of sufficient size to enclose an erect male penis for both diameter and length, open at both ends, with the fore end adapted to seal with the body of a user and the aft end adapted to connect directly to a vacuum generating unit;
a vacuum generating unit having a self contained electrically driven rotary vacuum pump including a power source and a control switch;
said vacuum generating unit having connector means at one end adapted to form a seal with the aft end of the elongated evacuation tube;
passage means communicating the vacuum pump to the interior of the evacuation tube and to the exterior of the vacuum generating unit through which air inside said tube may be removed;
said vacuum generating unit having an adjustable, spring loaded vacuum limiting valve mounted in parallel with the vacuum pump to admit outside air into the evacuated zone when it reached the desired level of vacuum in the elongated evacuation tube; and
wherein the fore end of the evacuation tube is reduced in diameter with a smooth ground finish inside and out.

5,462,515
MULTI-FUNCTIONAL AUTOMATIC CIRCULAR MASSAGING DEVICE

Chin-Tsun Tseng, No. 13, Lane 380, Sec. 2, Chung-Shan Rd., Chung-Ho City, Taipei Hsian, Taiwan, Prov. of China
Filed Dec. 21, 1993, Ser. No. 171,216
Int. Cl.^{6} A61H *1/00*
U.S. Cl. 601—57 1 Claim

1. An automatic massaging device for a back pad, comprising a plurality of motors, each said motor driving a rotating cam means for creating a vibrating massaging effect, each said motor and respective cam means being disposed in a separate housing, a soft pad formed with a plurality of separate lateral recesses each recess receiving one of said housings, a surface layer covering said soft pad, and a controlling box connected to said motors and an external power source, wherein each of said housings has an upper



cap with outward extending edges so as to facilitate the installation of said housings in the soft pad,

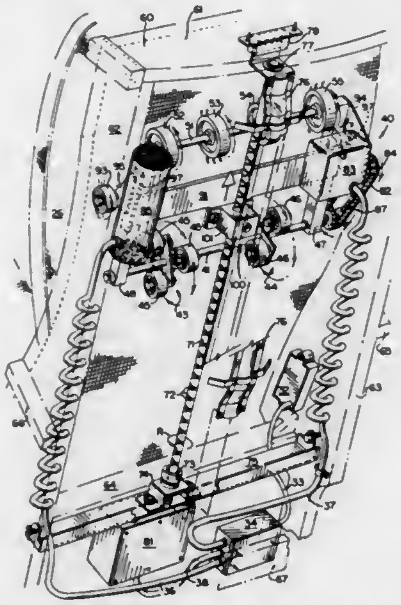
said surface layer having front and back surfaces, said front surface formed with a plurality of alternating X-shaped protuberances and spherical bosses and said back surface formed with slide-proof crossing strips,

said controlling box containing a circuit board which independently controls the speed at which each motor rotates, with means for rotating each motor independently at a plurality of speeds including off, slow rotation, and fast rotation speeds so that each said motor is able to simultaneously operate at different speeds such that by operating the motors at the same time at the said plurality of speeds, a number of different vibration intensity levels are achieved, and

means for achieving periodically cycling vibration massage intensity levels by operating the said automatic massaging device at each of the said vibration intensity levels for a short and equal duration of time, repetitively cycling between the weakest and the strongest intensity levels.

5,462,516
CYCLICAL ACTION MASSAGING CHAIR

Louis R. Anderson, Waxhaw, N.C., assignor to Niagara Therapy Manufacturing, Inc., Stanley, N.C.
Filed Dec. 29, 1993, Ser. No. 174,840
Int. Cl.⁶ A61H *15/00*
U.S. Cl. 601—99 **18 Claims**



1. A massaging apparatus for providing an efficient and comfortable massage, the massaging apparatus comprising:

a massaging carriage;

first drive means connected to the carriage for reciprocating said carriage along a path of travel;

a first transverse rod rotatably mounted to said carriage;

at least one roller assembly mounted to said first transverse rod and including a plurality of separate rollers which are mounted for free rotation about parallel axes which are radially spaced from and parallel to said first transverse rod axis, said plurality of rollers adapted to contact a massage surface;

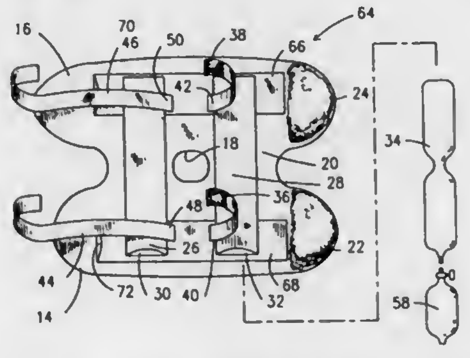
second drive means mounted to said carriage for rotating said first transverse rod about its axis so that said rollers sequentially rotate about the rod axis and thereby provide a cyclical action massage to the massage surface in contact with said rollers as said rollers rotate about said first transverse rod axis;

a second transverse rod mounted to said carriage generally parallel to said first transverse rod so that said second transverse rod reciprocally travels in a corresponding relationship to the reciprocal travel of said carriage, said second transverse rod having a plurality of rollers mounted thereto, to thereby provide a pressure type massage to the massage surface in contact with said plurality of rollers; and

vibration means mounted to said carriage for vibration of said plurality of rollers during the reciprocal travel of said carriage.

5,462,517
KNEE BRACE HAVING AN INFLATABLE BLADDER SUPPORT

Donaerl B. Mann, High Springs, Fla., assignor to D'Mannco, Inc., High Springs, Fla.
Continuation-in-part of Ser. No. 904,844, Jun. 26, 1992, Pat. No. 5,385,538. This application Aug. 22, 1994, Ser. No. 294,086
The portion of the term of this patent subsequent to Jan. 31, 2012, has been disclaimed.
Int. Cl.⁶ A61F *5/04*
U.S. Cl. 602—26 **17 Claims**



12. An orthopedic appliance for surrounding a knee of a patient to treat knee flexion contractures, the appliance comprising,

a cloth body having a top and bottom layer, a foam layer located intermediate the top and bottom layers, and a generally centrally located hole, the top layer covered by a tightly woven fabric, the bottom layer covered by a soft non-abrasive material for contact with the skin of the patient, the cloth body-wrapped around the knee of the patient such that an area is provided from which a patella portion of the knee can protrude and the centrally located hole exposes a posterior portion of the knee,

hook and loop straps attached to the top layer of the cloth body for securing the cloth body in a wrapped position

two longitudinal pockets integrally attached to the top layer of the cloth body on opposed sides of the generally centrally located hole, each longitudinal pocket having an opening formed therein,

an air bladder mounted within each of the two longitudinal pockets, the air bladders permitting inflation to rigidly set the knee in a desired position and deflation so that the patient can flex the knee, the air bladders having been inserted through the openings in the longitudinal pockets,

a longitudinal support element mounted within each of the two longitudinal pockets for providing lateral support to the orthopedic appliance, the longitudinal support elements having been inserted through the openings formed in the pockets, the support elements mounted adjacent the air bladders,

two latitudinal pockets integrally attached to the top layer of the cloth body above and below the generally centrally located hole, each latitudinal pocket having a opening formed therein, and

a flexible support element mounted within each of the two latitudinal pockets for providing medial support to tendons of the knee flexion contracture above and below the posterior portion of the knee, the flexible support elements having been inserted through the openings in the latitudinal pockets.

5,462,518

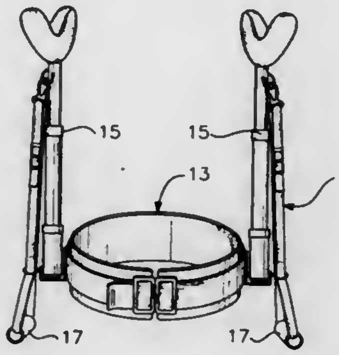
THERAPEUTIC SPINAL TRACTION APPARATUS AND MULTIPURPOSE EXERCISE SYSTEMS AND METHODS

Charles A. Hatley, and Deborah A. Atchison, both of 1232 Lighterwoods Dr., Mobile, Ala. 36695

Filed Mar. 7, 1994, Ser. No. 206,649

Int. Cl.^{6} A61H *1/02*

U.S. Cl. 602—36 **7 Claims**



1. A multipurpose apparatus for applying spinal traction, distraction, manipulation, and adjustment, for exercising, and for stretching muscles, tendons, and ligaments of the upper body comprising:

(a) a belt means for providing support above the hips and pelvis of the user;

(b) a first telescopic support means mounted from each side of said belt means;

(c) a biasing means mounted inside said first telescopic support means for exerting upward pressure;

(d) a second support means mounted on an end of each said first telescopic support means distal from said belt means for supporting the user under the arms against the pressure of said biasing means;

(e) a transfer means connected to said first telescopic support means for transferring the pressure exerted by said biasing means away from said second support means, wherein said transfer means further comprises a flexible strap means attached to said first telescopic support means at a proximal and of said strap means, said strap means further comprising a grip means on the distal end from said first telescopic support means whereby the user can exert muscle tension against said biasing means by grasping said grip means with his hands and pulling said strap means downward away from said second support means thereby pulling said second support means away from the user's underarm region and reducing the tension of said biasing means felt by the user in that underarm region.

5,462,519

BED SORE PAD

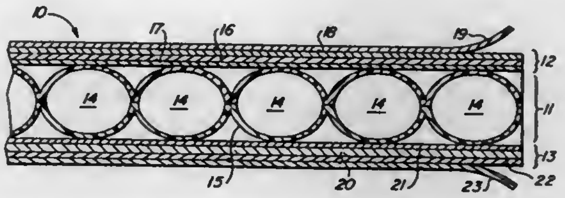
Juanita Carver, 9866 Reagan Rd. #126, San Diego, Calif. 92126

Division of Ser. No. 44,231, Apr. 7, 1993, Pat. No. 5,364,339.

This application Nov. 9, 1994, Ser. No. 336,493

Int. Cl.^{6} A61F *5/00*

U.S. Cl. 602—47 **9 Claims**



1. A method of protecting a bed sore on a person's body while in bed, comprising the steps of providing a closed cell air bubble film having an interior aperture for receiving said bed sore, adhering a first surface of said film to said person's body with said interior aperture registering with said bed sore to avoid contact between film and sore, and adhering a second surface of said film ti said bed, whereby said film is held against lateral shifting and thereby maintains sustained lift of said person's body away from said bed in the area of said bed sore.

5,462,520

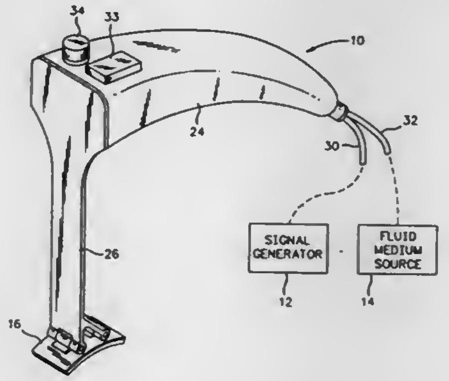
TRANSSURFACE DRUG DELIVERY BY ELECTROFUSION OF MICROBUBBLES TO THE TISSUE SURFACE

Gunter A. Hofmann, San Diego, Calif., assignor to Genetronics, Inc., San Diego, Calif.

Continuation-in-part of Ser. No. 931,061, Aug. 17, 1992, Pat. No. 5,318,514. This application Mar. 30, 1994, Ser. No. 219,970

Int. Cl.^{6} A61N *1/30;* **A61K** *38/00*

U.S. Cl. 604—20 **18 Claims**



1. A method of trans surface tissue molecular delivery comprising the steps of:

selecting a quantity of microbubble carriers,

selecting a quantity of molecules to be delivered across the surface tissue;

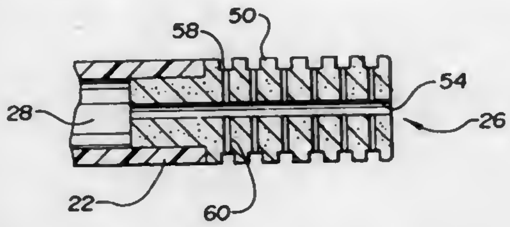
encapsulating said molecules within said microbubble carriers;

contacting a selected area of the surface tissue with a quantity of said carriers containing said encapsulated molecules; and

applying a pulsed electric field of sufficient amplitude and duration to induce electrofusion between the surface tissue and said microbubbles and create pores in the surface tissue to enable diffusion of the molecules from said microbubble carriers through the surface tissue.

5,462,521
FLUID COOLED AND PERFUSED TIP FOR A CATHETER

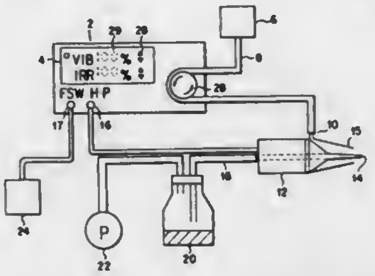
Greg G. Brucker, Minneapolis, Minn.; Jerome P. Saul, Newton, Mass., and Steven D. Savage, Brooklyn Center, Minn., assignors to Angeion Corporation, Plymouth, Minn.
Filed Dec. 21, 1993, Ser. No. 171,213
Int. Cl.^{6} A61M *25/00*
U.S. Cl. 604—20 **61 Claims**

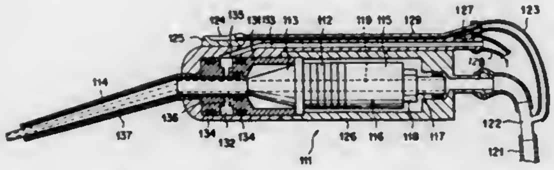


19. A catheter tip for use in cardiac signal measurement, comprising:
- a) a tip structure on a distal end of a catheter, the tip structure having an interior and comprising a porous material;
- b) a plurality of randomly disposed interstitial spaces formed within the porous material of the tip structure and in fluid communication with a source of fluid in the interior of the tip structure, the interstitial spaces directing a flow of fluid from the source of fluid in the interior of the tip structure over the exterior surface of the tip structure to provide a fluid protective layer surrounding the tip structure to minimize the contact of the tip with biological materials; and
- c) a monitoring device within the tip structure for measurement of electrical potentials in a biological tissue.

5,462,522
ULTRASONIC THERAPEUTIC APPARATUS

Tomohisa Sakurai; Yukiko Nagaoka; Tetsumaru Kubota, and Yuichi Ikeda, all of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan
Filed Dec. 13, 1993, Ser. No. 166,520
Claims priority, application Japan, Apr. 19, 1993, 5-091587
Int. Cl.^{6} A61B *17/20*
U.S. Cl. 604—22 **26 Claims**

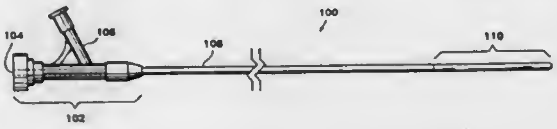


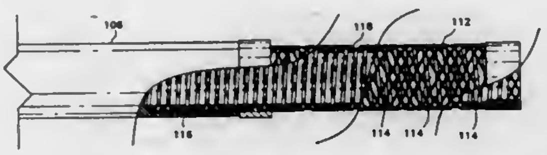


1. An ultrasonic therapeutic apparatus comprising:
- an apparatus body including a drive source for ultrasonic oscillation;
- a hand piece including an ultrasonic, vibrator and said hand piece being removably connected to the apparatus body;
- drive means in the apparatus body for applying voltage to the ultrasonic vibrator of the hand piece, thereby driving the ultrasonic vibrator;
- a probe removably connected to the hand piece and adapted to be vibrated by ultrasonic vibration produced as the ultrasonic vibrator is driven for treating organic tissue; water supply means for supplying cooling water to the probe for cooling the probe;
- suction means for removing waste matter by suction from the organic tissue treated by means of the cooling water and the probe;
- ultrasonic output setting means for setting a preset value for an ultrasonic output from the ultrasonic vibrator;
- feedwater output setting means for setting a preset value for a feedwater output from the water supply means;
- feedwater output control means for controlling the feedwater output set by the feedwater output setting means so that the preset feedwater output value is a value such that the probe is cooled and is not excessively heated to prevent damage to the probe; and
- memory means for storing the preset values for the ultrasonic output and the feedwater output.

5,462,523
DRUG DELIVERY SYSTEM

Gene Samson, Milpitas; Erik T. Engelson, Menlo Park; Hiram Chee, San Carlos, and Robert E. Woodard, Fremont, all of Calif., assignors to Target Therapeutics, Inc., Fremont, Calif.
Filed May 18, 1993, Ser. No. 63,918
Int. Cl.^{6} A61M *1/00*
U.S. Cl. 604—30 **68 Claims**





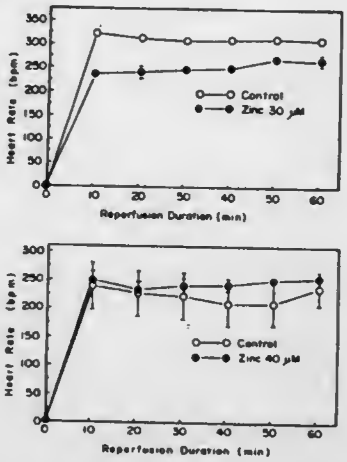
1. A fluid delivery tip for delivery of fluid through a catheter, said tip having a proximal end adapted to connect to a catheter body, a distal end, and an axis extending between said proximal and distal ends, comprising a stiffener and a perfuser:
- said stiffener extending axially between the proximal tip end and the distal tip end, having an inner stiffener surface and an outer stiffener surface, which stiffener is stiffer than the perfuser, and having openings to allow fluid flow from the inner stiffener surface to the outer stiffener surface at a high index flow rate, and
- said perfuser having an inner perfuser surface, an outer perfuser surface, located at and which is in contact with the outer stiffener surface, coaxial to the stiffener and extending axially between the proximal tip end and the distal tip end and adapted to allow fluid flow from the outer stiffener surface to the outer perfuser surface at an index fluid flow rate relatively lower than the stiffener index flow rate.

5,462,524

METHODS FOR IMPROVING RECOVERY OF HEART FUNCTION FROM OPEN HEART SURGERY

Saul R. Powell, Woodmere, and Anthony J. Tortolani, Manhasset, both of N.Y., assignors to Research Corporation Technologies, Tuscon, Ariz.

Filed Jul. 8, 1993, Ser. No. 89,213
Int. Cl.^{6} A61M *31/00*
U.S. Cl. 604—52 **23 Claims**



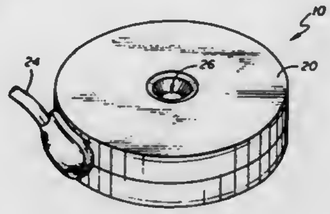
1. In a method of improving recovery of a mammal after surgery when the heart of said mammal is subjected to cardioplegia by infusion with a cardioplegic solution at a hypothermic temperature; an improvement comprising infusing said heart for a sufficient time during at least the onset of cardioplegia with a cardioplegic solution which contains a sufficient amount of zinc complexed to a physiologically acceptable ligand, to improve cardiac function and recovery of the mammal after surgery.

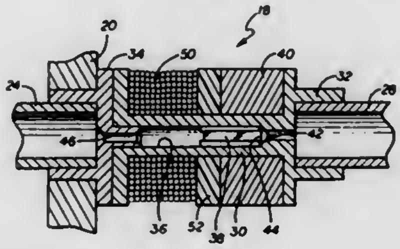
5,462,525

FLOW SENSOR FOR AN INFUSION PUMP

Chad Srisathapat, Sun Valley, and Paul A. Yates, La Jolla, both of Calif., assignors to MiniMed, Inc., a Delaware corporation, Sylmar, Calif.

Filed Jun. 14, 1994, Ser. No. 259,470
Int. Cl.^{6} A61M *5/00*
U.S. Cl. 604—67 **19 Claims**





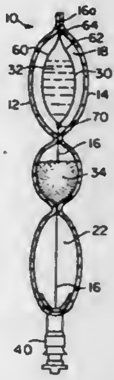
1. A medication infusion pump, comprising:
a pump housing having a medication chamber formed therein for receiving a supply of a selected medication;
pump means within said housing for delivering the medication from said medication chamber through a discharge conduit to a patient; and
flow sensor means for monitoring flow of the medication through said discharge conduit, said flow sensor means including an inductor coil mounted externally about said discharge conduit, and a core pin of a magnetically attractable material mounted within said discharge conduit for displacement therein relative to said inductor coil in response to medication flow through said discharge conduit;
said flow sensor means including means for normally retaining said core pin in a first position retracted from said inductor coil during nonflow of medication through said discharge conduit, said core pin responding to flow of medication through said discharge conduit for displacement from said first position to a second position disposed generally coaxially within said inductor coil;
said core pin retaining means comprising means for magnetically retracting said core pin to said first position.

5,462,526

FLEXIBLE, STERILE CONTAINER AND METHOD OF MAKING AND USING SAME

Ward W. Barney, Mission Viejo, and Steven L. Smith, Lake Forest, both of Calif., assignors to McGaw, Inc., Irvine, Calif.

Filed Sep. 15, 1993, Ser. No. 121,614
Int. Cl.^{6} A61M *1/00*
U.S. Cl. 604—85 **23 Claims**



1. A flexible, sterile container for storing and mixing medicaments and diluent liquids in a sterile environment, and dispensing mixtures thereof, comprising:
a flexible shell having a top, bottom and sides with a sterile interior;
at least one sterile compartment within said shell;
at least one medicament disposed within said at least one sterile compartment;
at least one sterile, self-contained, flexible pouch containing a diluent liquid suspended within said at least one sterile compartment, wherein the sterile pouch is permanently connected along an upper edge to a top portion of the flexible containers, said flexible pouch being rupturable by application of pressure to the shell and pouch sufficient to release the liquid into the sterile compartment for subsequent mixing with said medicament without rupturing the shell; and
dispensing means for dispensing a mixture of liquid and medicament from said container.

5,462,527

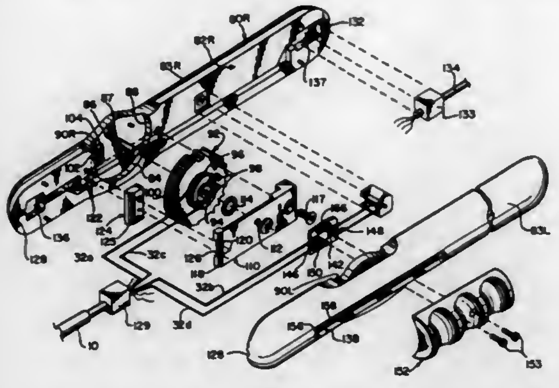
ACTUATOR FOR USE WITH STEERABLE CATHETER

Debbie Stevens-Wright, Fitchburg; Massimo Russo, Brookline; Peter Nielsen, Quincy, and Paul Bertram, Hudson, all of Mass., assignors to C.R. Bard, Inc., Murray Hill, N.J.

Filed Jun. 29, 1993, Ser. No. 84,549

Int. Cl.^{6} A61M ***37/00***

U.S. Cl. 604—95 **20 Claims**



1. For use with a steerable catheter having an elongated shaft, a tip assembly attachable to at least two pull cables for bending said tip assembly, a handle/actuator, comprising:

a housing,

means for attaching said elongated shaft to one end of the housing, said means for attaching a longitudinal axis,

a wheel rotatably supported in said housing,

at least two pull cables, the distal ends of said pull cables adapted to be attached to said tip assembly at different locations;

means for attaching at least a first of said pull cables to said wheel such that manual application of a first force to said wheel causes rotation of said wheel in one direction to apply tension to said pull cable, at least a portion of said wheel being accessible from the exterior of said housing so that said wheel can be rotated manually,

a slider slidably mounted in said housing,

means for attaching at least a second of said pull cables to said slider such that manual application of a second force to said slider causes linear movement of said slider in one direction relative to said housing to apply tension to said second cable, and

means circumferentially spaced apart from said wheel about the exterior of said housing for moving said slider, said means for moving being movable axially with respect to said longitudinal axis of said shaft attaching mean of to said housing.

5,462,528

STOMACH TUBE

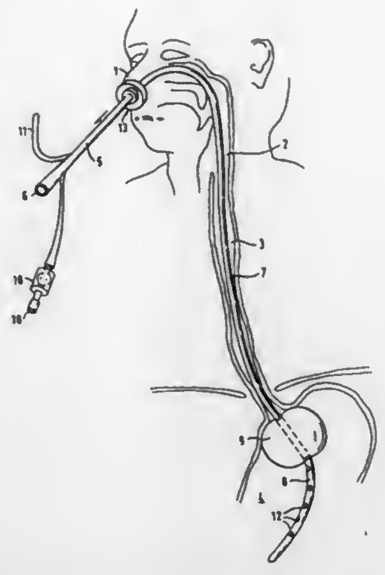
Norbert Roewer, Butenfeld 45, 2000 Hamburg 54, Germany

Continuation of Ser. No. 635,151, Dec. 21, 1990, abandoned. This application Oct. 15, 1992, Ser. No. 962,031

Claims priority, application Germany, Jul. 1, 1988, 8808484 U

Int. Cl.^{6} A61M ***25/00***

U.S. Cl. 604—96 **9 Claims**



1. In a stomach tube assembly comprising a stomach tube with a stomach end section with a stomach balloon adapted, when not inflated, to be inserted within the stomach and, after such insertion, to be inflated for use in closing the stomach opening between the stomach and oesophagus by pulling the balloon into engagement with the stomach wall around the stomach opening, a pressure lumen connected to the stomach balloon for inflating the balloon and a suction tube extending to the stomach end section below the stomach balloon for withdrawing the contents of the stomach, and a nose stop mounted on the stomach tube to press against the nose of the patient to maintain the stomach tube under tension within the patient; the improvement wherein the stomach tube assembly comprises indicator means for providing a direct visual indication of the pressure in the pressure lumen at each of first and second, predetermined, relatively lower and higher pressure levels respectively, having a desired pressure differential, the first pressure level being the desired inflation pressure of the stomach balloon in the stomach, without the stomach tube under tension, to inflate the stomach balloon for use in closing the stomach opening, the second pressure level being a predetermined desired pressure level of the stomach balloon obtained by tensioning the stomach tube, after the stomach balloon is inflated in the stomach at approximately the first pressure level, until the second pressure level indication is obtained, to pull the inflated balloon into sealing engagement with the stomach wall around the stomach opening at said predetermined desired pressure level for closing the stomach opening.

5,462,529

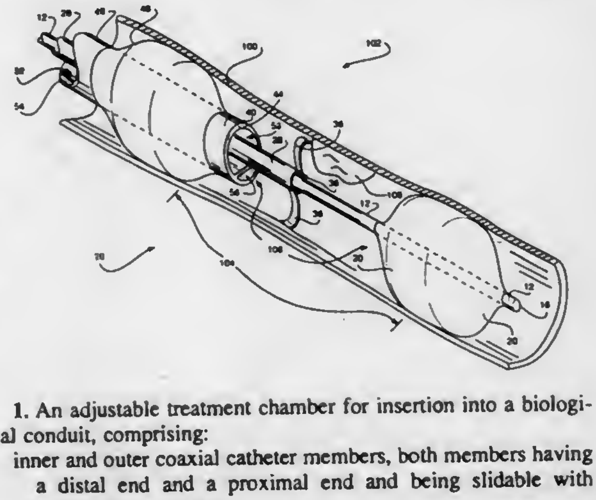
ADJUSTABLE TREATMENT CHAMBER CATHETER

John B. Simpson, Woodside, and Scott C. Anderson, Mountain View, both of Calif., assignors to Technology Development Center, Redwood City, Calif.

Filed Sep. 29, 1993, Ser. No. 128,948

Int. Cl.^{6} A61M ***25/00***

U.S. Cl. 604—101 **21 Claims**



1. An adjustable treatment chamber for insertion into a biological conduit, comprising:

inner and outer coaxial catheter members, both members having a distal end and a proximal end and being slidable with respect to each other;

two expandable sealing members, one sealing member being disposed near the distal end of each catheter member;

means for expanding the sealing members to form a pair of seals with the biological conduit, an adjustable length treatment chamber being defined within the conduit and between the seals

an intermediate coaxial catheter member located between the inner and the outer coaxial catheter members and having a distal end and a proximal end, the intermediate catheter member being slidable and rotatable with respect to the other catheter members; and

burden loosening means disposed near the distal end of the intermediate catheter member for sliding and axial rotation within the treatment chamber to loosen plaque burden deposited on the biological conduit,

whereby, when the adjustable treatment chamber catheter is inserted into the biological conduit and the catheter members are slid with respect to each other to extend the distal end of the inner catheter member beyond the distal end of the outer catheter member and to adjust the longitudinal separation between the sealing members to a predetermined distance, the sealing members then being expanded, the adjustable length treatment chamber is created within the conduit and between the seals.

5,462,530

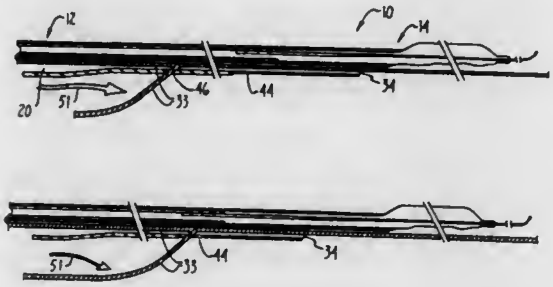
INTRAVASCULAR CATHETER WITH BAILOUT FEATURE

G. David Jang, 636 Golden West Dr., Redlands, Calif. 92373

Continuation-in-part of Ser. No. 865,975, Apr. 9, 1992, Pat. No. 5,263,932. This application Nov. 23, 1993, Ser. No. 157,663

Int. Cl.^{6} A61M *29/00*

U.S. Cl. 604—160 **15 Claims**



1. An intravascular catheter, comprising:

a catheter shaft having a proximal end, a distal portion, an outer wall, a distal end, and an interior lumen extending therethrough, and having diagnostic or therapeutic means mounted on the distal portion;

a bailout lumen attached to the outer wall of said catheter shaft, said bailout lumen having a proximal opening and a distal opening, said lumen extending along the outer wall of said catheter shaft from a point within about 30 cm of the proximal end of the catheter to a point proximal to and within about 30 cm of said diagnostic or therapeutic means, said bailout lumen adapted to receive a removable guidewire and having an outer wall.

5,462,531

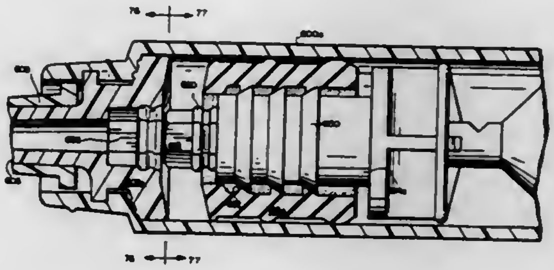
SAFETY SYRINGE NEEDLE DEVICE WITH INTERCHANGEABLE AND RETRACTABLE NEEDLE PLATFORM

Laurel A. Novacek; Fraser R. Sharp, and Donald A. McLean, all of Vancouver, Canada, assignors to Inviro Medical Devices Ltd., Barbados, Br. Indian Ocean Ter.

Continuation-in-part of Ser. No. 128,694, Sep. 30, 1993, Pat. No. 5,415,638, which is a continuation-in-part of Ser. No. 909,385, Jul. 9, 1992, Pat. No. 5,263,933, which is a continuation-in-part of Ser. No. 800,849, Nov. 29, 1991, Pat. No. 5,205,827, which is a division of Ser. No. 687,108, Apr. 18, 1991, Pat. No. 5,112,318, which is a continuation-in-part of Ser. No. 607,127, Oct. 3, 1990, Pat. No. 5,122,124, which is a continuation-in-part of Ser. No. 410,318, Sep. 21, 1989, Pat. No. 5,030,208, which is a continuation-in-part of Ser. No. 327,344, Mar. 22, 1989, abandoned, which is a continuation-in-part of Ser. No. 285,012, Dec. 14, 1988, abandoned. This application Dec. 21, 1994, Ser. No. 361,227

Int. Cl.^{6} A61M *5/00*

U.S. Cl. 604—110 **33 Claims**



1. A syringe comprising:

(a) a hollow, axially elongated barrel;

(b) an adapter carried by said barrel adjacent a distal end thereof and removable therefrom in response to rotation relative to said barrel, the adapter carrying a needle and providing fluid communication with the interior of said hollow barrel;

(c) a plunger axially movable in said barrel; and

(d) adapter engagement structure disposed at the distal end of the plunger and engageable with a mating connection engagement structure on the adapter, said structures having respective drive and connective engagement surfaces, said drive surfaces being engageable with one another in response to axial movement of said plunger toward the distal end of said barrel and jointly movable upon engagement to enable rotation of the adapter relative to the barrel in response to relative rotation of the plunger and barrel to cause the adapter to part from the distal end of the barrel, said connective surfaces being engageable with one another to connect the plunger and adapter one with the other and enable said adapter, when parted from the end of the barrel in response to joint rotation of said adapter and said plunger relative to said barrel, to be withdrawn with the needle into the interior of the barrel in response to joint axial movement of said plunger and said adapter in a direction away from the distal end of the barrel.

5,462,532

TROCAR WITH SAFETY SENSING SLEEVE

Charles Gresl, San Francisco, Calif., assignor to Origin Medsystems, Inc., San Carlos, Calif.

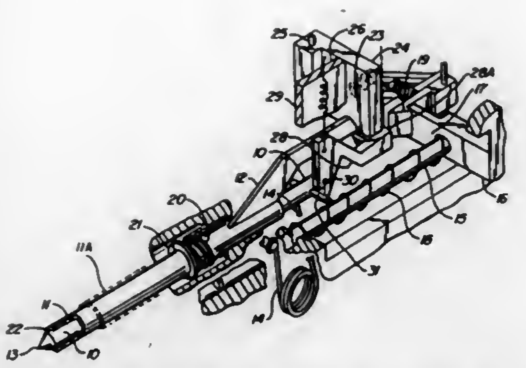
Filed Mar. 17, 1993, Ser. No. 32,955

Int. Cl.^{6} A61B *17/34*

U.S. Cl. 604—164 **17 Claims**

1. A trocar assembly comprising:

a cannula having a distal end and a proximal end, a handle at the proximal end of said cannula, and an elongate obturator within said cannula having a distal end, said elongated obturator having a piercing means at its distal end;



a sleeve mounted concentrically around said obturator and being axially movable relative to said obturator between a sensing position and a released position;

wherein said obturator being axially movable relative to said cannula between a locked extended position wherein said piercing means of said obturator protrudes from said distal end of said cannula, and a retracted position wherein said obturator is retracted into said cannula;

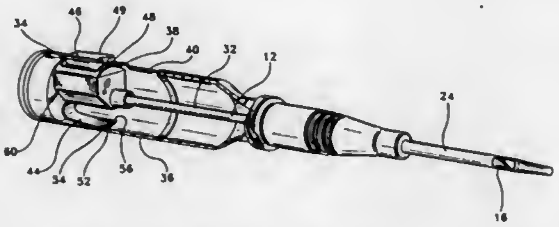
triggering means communicating between said sleeve and said obturator to unlock said obturator from said extended position upon movement of said sleeve from said sensing position to said released position;

a first biasing means acting on said sleeve in said sensing position to counteract force exerted at a distal end of said sleeve during penetration of said obturator and sleeve through an orifice created by said piercing means in body tissue to thereby maintain said sleeve in said sensing position during penetration while allowing slight motion of said sleeve in the proximal and distal directions without releasing said triggering means when said obturator is in said locked extended position; and

second biasing means on said obturator to move said obturator to said retracted position upon unlocking said obturator from said extended position.

5,462,533
SELF CONTAINED NEEDLE AND SHIELD

Charles W. Daugherty, Sandy, Utah, assignor to Becton, Dickinson and Company, Franklin Lakes, N.J.
Continuation of Ser. No. 96,794, Jul. 23, 1993, abandoned. This application Jan. 9, 1995, Ser. No. 370,331
Int. Cl.^{6} A61M *5/178*
U.S. Cl. 604—164 **7 Claims**



1. A surgical needle assembly, comprising:

a hollow housing having a proximal end and a distal end and defining a slot therein, the slot having a medial portion, a distal portion and a proximal portion wherein the medial portion has a width that is less than the width of the distal portion and the proximal portion;

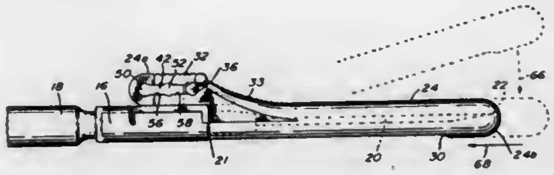
a hub movably disposed in the housing, the hub having a raised latching portion adapted to engage the distal portion of the slot when the hub is distal of the proximal end of the housing and to engage the proximal portion of the slot when the hub is adjacent the proximal end of the housing so as to axially lock the hub with respect to the housing;

a needle with a sharp distal tip and a proximal end affixed to the hub; and

a spring connected to the hub to bias the hub toward the slot.

5,462,534
NEEDLE ASSEMBLY FOR USE WITH A SYRINGE

Joe Debreczeni, Brossard, Canada, assignor to Moldex Plastics & Tool Inc., Canada
Filed Nov. 16, 1994, Ser. No. 340,633
Claims priority, application Canada, Jan. 19, 1994, 2118458
Int. Cl.^{6} A61M *5/32*
U.S. Cl. 604—192 **9 Claims**



1. A needle assembly for use with a syringe comprising:

a needle device including a needle holder and a needle having a pointed free end protruding from the holder along a longitudinal axis;

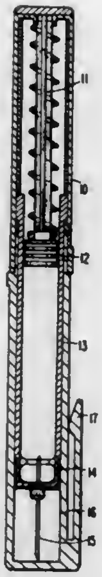
a needle guard including a hollow cylindrical sheath around the needle and having a first end mounted to the needle holder and an opposite closed end in proximity to the needle pointed end said sheath defining a needle passage therein; and

cooperating means mounted to said needle holder and said needle guard to anchor said needle guard to said holder; said cooperating means including elongate slot means extending parallel and offset to the longitudinal axis of said needle and pivot means engaged in said slot means and extending along an axis perpendicular and offset to the longitudinal axis of said needle whereby the needle guard may be pivoted about said offset axis from a first position in which the pointed end is protected by the sheath to a second position in which the needle guard extends rearwardly in substantially parallel proximity to a syringe to which is mounted the needle assembly, and in which the needle point is exposed for use; said slot means defining an elongated opening whereby said pivot means may be engaged at least at two positions, including a primary position and a secondary position, and whereby said sheath is displaceable in a longitudinal direction with respect to the needle from said primary position in which the needle pointed end is protected by a portion of the sheath to said secondary position in which said needle guard may be pivoted between said first and second positions.

5,462,535
SYRINGE SYSTEM

Frits F. Bonnichsen, Lynge, and Peter N. Jørgensen, Broenshoej, both of, Denmark, assignors to Novo Nordisk A/S, Bagsvaerd, Denmark
Continuation-in-part of Ser. No. 167,831, Dec. 16, 1993, abandoned. This application Oct. 14, 1994, Ser. No. 323,401
Int. Cl.^{6} A61M *5/32*
U.S. Cl. 604—272 **10 Claims**

1. An insulin injection system comprising a pen shaped syringe comprising a cartridge with insulin and an injection needle, wherein the needle is a G30 needle and the cartridge contains an insulin type which may freely flow through the G30 needle.



5,462,536
PROTEIN NONADSORPTIVE MEMBRANES FOR WOUND DRESSINGS

James A. Braatz, Beltsville; Clifton L. Kehr, Silver Spring, both of Md.; Timothy G. Grasel, Calabasas, Calif., and William S. Letter, Columbia, Md., assignors to Hampshire Chemical Corp., Lexington, Mass.

Continuation of Ser. No. 825,361, Jan. 24, 1992, abandoned. This application Jul. 14, 1993, Ser. No. 91,532

Int. Cl.^{6} A61F *13/00;13/02*

U.S. Cl. 604—304 **27 Claims**

1. A wound dressing comprising a hydrophilic, biocompatible, protein nonadsorptive, controlled release membrane, wherein said membrane consists essentially of a permeable, three dimensional, crosslinked, polymeric network of a hydrated polyurea-urethane polymer hydrogel derived from prepolymer units at least 75% of which are oxyethylene-based diols or polyols having an average molecular weight of about 10,000 to about 30,000, said diols or polyols having essentially all of the hydroxyl groups capped with polyisocyanate; and a drug incorporated into said polymeric network of said membrane in an amount effective for treating wounds.

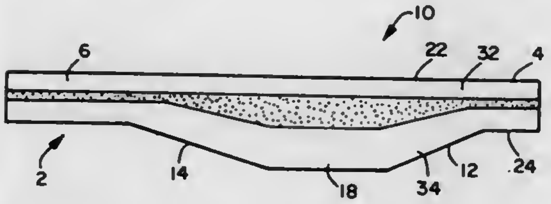
5,462,537
ABSORBENT ARTICLE WITH INVERSELY RELATED GRADIENTS

James M. Carr, Kaukauna, and Elwood W. Harke, Kimberly, both of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Jul. 31, 1991, Ser. No. 738,698

Int. Cl.^{6} A01F *13/15*

U.S. Cl. 604—368 **3 Claims**



1. An absorbent article, comprising:

a layer comprising generally oppositely disposed end areas, a target area between said end areas, and a top surface and a bottom surface defining therebetween a layer thickness, said target area having a higher average basis weight and a lower average density than one of said end areas,

said layer further comprising an absorbent fibrous material and superabsorbent particles, all of said superabsorbent particles being in a discrete lamina.

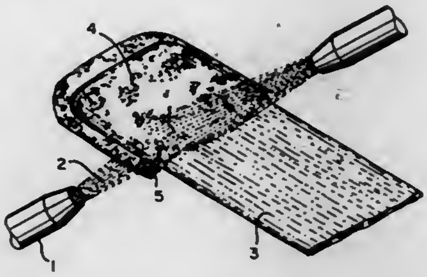
5,462,538
MOLTEN ADHESIVE FIBERS AND PRODUCTS MADE THEREFROM

Ralf Korpman, Bridgewater, N.J., assignor to McNeil-PPC, Inc., Milltown, N.J.

Filed Dec. 16, 1993, Ser. No. 168,550

Int. Cl.^{6} A61F *13/15;13/20*

U.S. Cl. 604—372 **34 Claims**



1. An article comprising a substrate coated on at least one surface with pressure-sensitive adhesive microfibers at a weight of about 0.05 to about 2 ounces/square yard, wherein said pressure-sensitive adhesive microfibers comprise about 100 parts of an elastomeric component; about 20 to 300 parts of a resin component; and about 0 to about 70 parts of a plasticizer, with parts expressed in parts per one hundred parts by weight of the elastomeric component; and said microfibers have an average diameter of less than about 100 microns.

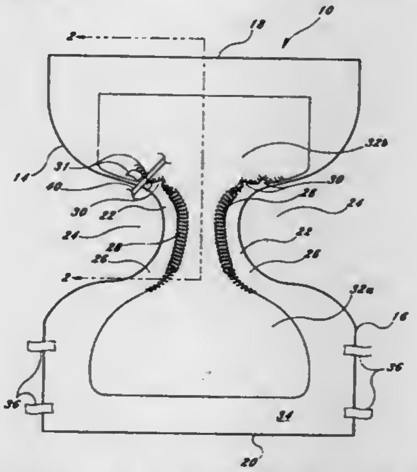
5,462,539
HYGIENE (INCONTINENCE) PAD FOR CATHETER USERS

Ella H. Herman, 2325 SW. 17th Cir., Delray Beach, Fla. 33445; Frank Nelams, 234 SW. 12th Ave., Delray Beach, Fla. 33444, and Joseph M. Hilbish, 22 Skyline Dr., Upper Saddle River, N.J. 07458

Filed Jun. 30, 1994, Ser. No. 268,328

Int. Cl.^{6} A61F *13/15*

U.S. Cl. 604—385.1 **14 Claims**



1. An incontinence pad for catheter users to be worn around the lower abdomen and genital area body portions of a wearer, comprising:

a liquid impervious back sheet defining the shape and dimensions of said incontinence pad;

a crotch portion adapted to engage the crotch of a wearer to capture and retain body waste material when said incontinence pad is folded medially and worn engaging a waist area of the wearer, said crotch portion having elastic along the periphery thereof which allows for conformity to a leg of the wearer on each side and a tight seal to be formed around the leg of the wearer;

an absorbent pad for receiving body waste material connected to an inner surface of said back sheet, said incontinence pad having a front area and a rear area, said absorbent pad being thinner in the front area of said incontinence pad than in the rear area of said incontinence pad, thereby improving wearer comfort; and

at least one peripheral notched area proximate the crotch portion for permitting a urethral catheter tube to pass therethrough, said at least one peripheral notched area including means for securing the catheter tube within the at least one peripheral notched area proximate a peripheral edge of said at least one peripheral notched area.

5,462,540

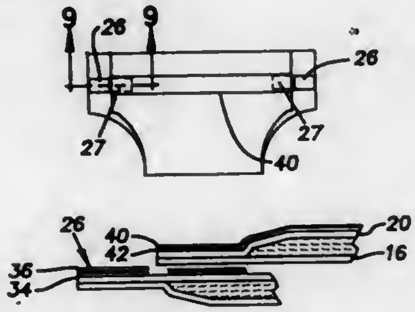
TABLESS DIAPER WITH A MULTI-COMPONENT TAPE FASTENER

Carol A. Caldwell, Kirtland Hills, Ohio, assignor to Avery Dennison Corporation, Painesville, Ohio

Continuation of Ser. No. 845,195, Mar. 2, 1992, abandoned. This application Jul. 20, 1994, Ser. No. 277,778

Int. Cl.^{6} A61F *13/15*

U.S. Cl. 604—389 **5 Claims**



1. A tabless adhesively-fastenable disposable diaper including a diaper assembly proper having first and second ends and an inner face and an outer face and comprising a moisture-pervious inner layer adapted to be positioned adjacent a wearer's body, an absorbent batt adjacent to said inner layer, and a moisture-impervious outer layer adjacent to said absorbent batt, said inner and outer layers of said diaper assembly having a generally hour-glass configuration and being larger than said absorbent batt and secured to one another outwardly of said absorbent batt to provide at the periphery of said configuration a flexible two-layer battless diaper margin including fastener-receiving areas on said inner face at each lateral side of the first end of said diaper assembly, an adhesive fastening means associated with each lateral side of said first end of said diaper assembly proper, each said adhesive fastening means being permanently bonded on said inner face to one of said fastener-receiving areas, each said adhesive fastening means being adapted to be releasably carried by protective means, said protective means comprising combined fastener-receiving and protective tape means permanently bonded to portions of the diaper assembly proper at the second end of the diaper and on said outer face, said diaper being configured for shipment and sale in a folded configuration with its first and second ends releasably adhered by said carrying of said adhesive fastening means by said combined fastener-receiving and protective tape means, the diaper, in said folded configuration, being wrapped around hinge lines, in the vicinities of said fastener-receiving areas.

5,462,541

POCKET-LIKE DIAPER OR ABSORBENT ARTICLE

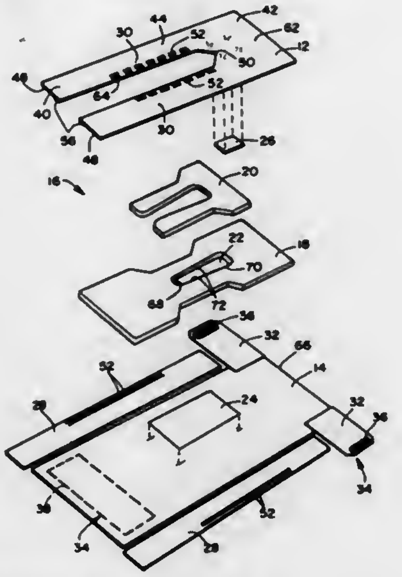
Mary A. Bruemmer, Appleton; Paulette M. Rosch, Menasha; John P. Vukos, Neenah; Duane G. Ultenbroek, Little Chute; Georgia L. Zehner, Larson, and Christine A. Rasmussen, Medford, all of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Continuation-in-part of Ser. No. 882,339, May 13, 1992, abandoned, which is a continuation of Ser. No. 612,168, Nov. 13, 1990, Pat. No. 5,176,672. This application Aug. 18, 1993, Ser. No. 116,262

The portion of the term of this patent subsequent to Jan. 5, 2010, has been disclaimed.

Int. Cl.^{6} A61F *13/15*

U.S. Cl. 604—391 **12 Claims**



1. An absorbent article, comprising:

a backsheet,

a topsheet having an opening therein, wherein said opening allows solid fecal matter to move underneath said topsheet,

an absorbent having a hole therein and being between said backsheet and said topsheet, wherein said hole extends through said absorbent,

an elevating means below said topsheet for elevating at least a portion of said topsheet away from said absorbent, thereby forming a shape effective to allow solid fecal matter to move underneath said topsheet, wherein said shape is positioned underneath said topsheet, and

a masking layer being positioned between said backsheet and said absorbent, wherein said masking layer comprises a first layer of absorbent material and a second layer of liquid-impermeable material.

5,462,542

STERNUM BUCKLE WITH SERRATED STRAP

Thomas W. Alesi, Jr., New Fairfield, Conn., assignor to United States Surgical Corporation, Norwalk, Conn.

Filed Jan. 24, 1994, Ser. No. 186,409

Int. Cl.^{6} A61B *17/04*

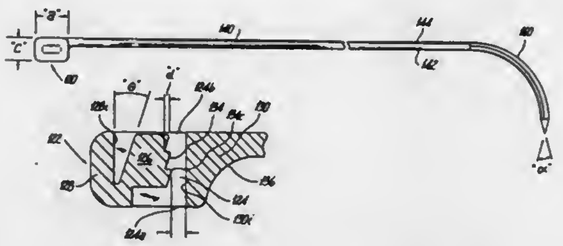
U.S. Cl. 606—151 **12 Claims**

1. An assembly to be looped about split portions of tissue, which comprises:

a flexible elongated strap adapted to be looped about split portions of tissue, said strap including a plurality of ratchet teeth along a portion thereof;

a buckle member attached to one end portion of said elongated strap, said buckle member comprising:

a base member defining a generally transverse channel having an entrance end and an exit end, said channel dimensioned



for reception of said elongated strap, said base member including first and second opposed end walls and a pair of opposed side walls; and

a pawl member disposed within said transverse channel and being pivotally and integrally connected to an inner surface of said first end wall of said base member, said pawl member including pawl teeth complementary in dimension and configuration to said ratchet teeth of said elongated strap and adapted to interlockingly engage said ratchet teeth to thereby secure said elongated strap in a looped tensioned condition about the tissue, said pawl teeth of said pawl member facing an inner surface of said second end wall of said base member, said elongated strap being integral with an upper portion of said second end wall adjacent said exit end of said transverse channel of said base member, said elongated strap including at least an inner and outer surface, said inner surface of said elongated strap being in contact with the tissue portions when said strap is in said looped tensioned condition, said outer surface of said elongated strap including said portion of said elongated strap having said ratchet teeth.

5,462,543

APPARATUS FOR ATTACHING SURGICAL SUTURE COMPONENTS

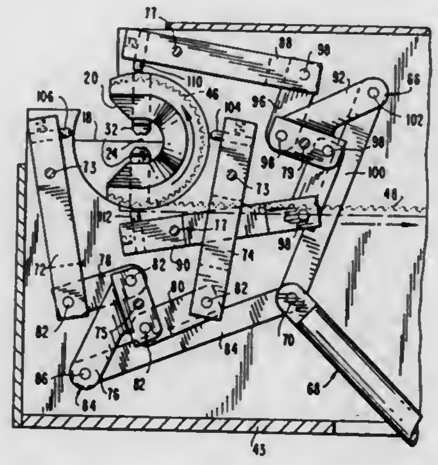
Francis D. Colligan, Waterbury, Conn., assignor to United States Surgical Corporation, Norwalk, Conn.

Continuation of Ser. No. 959,114, Oct. 9, 1992, Pat. No. 5,350,373. This application Jun. 9, 1994, Ser. No. 257,397

The portion of the term of this patent subsequent to Sep. 27, 2011, has been disclaimed.

Int. Cl.^{6} A61B ***17/00***

U.S. Cl. 606—1 **21 Claims**



1. Apparatus for attaching a surgical suture to an eyeless needle comprising:

support means;

die means attached to said support means for selectively impacting the needle such that a portion of the needle is deformed to maintain the suture therein, said die means being reciprocally rotatable between at least two positions;

first drive means associated with said support means for actuating said die means to impact the needle;

second drive means associated with said support means for reciprocally rotating said die means between said at least two positions relative to said needle; and

guide means positioned adjacent said die means for guiding the suture into a bore in the end face of the needle, said guide means being adjustable in at least two directions.

5,462,544

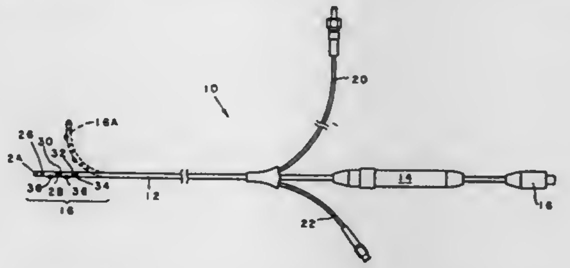
CONTINUOUS HEART TISSUE MAPPING AND LASING CATHETER

Sanjeev Saksena, Green Brook, N.J.; Stanislaw Sulek, Anaheim, and Hany M. G. Hussein, Costa Mesa, both of Calif., assignors to Energy Life System Corporation, Costa Mesa, Calif.

Filed May 5, 1993, Ser. No. 57,735

Int. Cl.^{6} A61B ***17/36;5/04***

U.S. Cl. 606—15 **17 Claims**



1. A continuous mapping and lasing catheter, suitable for intraoperative and percutaneous application, comprising a tubular body having at a distal end region thereof an envelope of plural surface electrode pairs spaced from one another and at least one fiber optic within said envelope for directing a laser beam at a target site adjacent to said envelope; said fiber optic being positioned between adjacent electrode pairs.

5,462,545

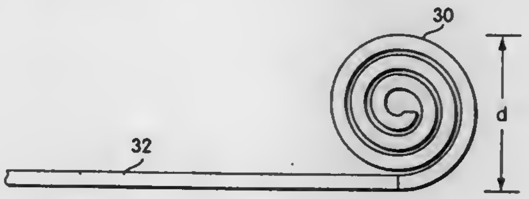
CATHETER ELECTRODES

Paul J. Wang, Chestnut Hill, and Peter W. Groeneveld, Cambridge, both of Mass., assignors to New England Medical Center Hospitals, Inc., Boston, Mass.

Filed Jan. 31, 1994, Ser. No. 189,595

Int. Cl.^{6} A61B ***17/39***

U.S. Cl. 606—41 **12 Claims**



1. A catheter electrode, comprising:

at least three electrically conductive panels which are:

disposed at a distal portion of a catheter and in a substantially coil configuration; disposed a substantially fixed radial distance from a directly-underlying axis extending lengthwise through the center of the catheter;

disposed substantially equally around the circumference of the distal portion of the catheter, and substantially isodiametric with the reminder of the catheter;

electrically isolated from each other; and each coupled to a first end of a different energy transmitting channel which has a second end couplable to an energy source and a recorder such that the panels;

are selectively energizable individually and in any combination by energy transmitted from the source through the channels to the panels, and

can transmit received signals through the channels to the recorder.

5,462,546

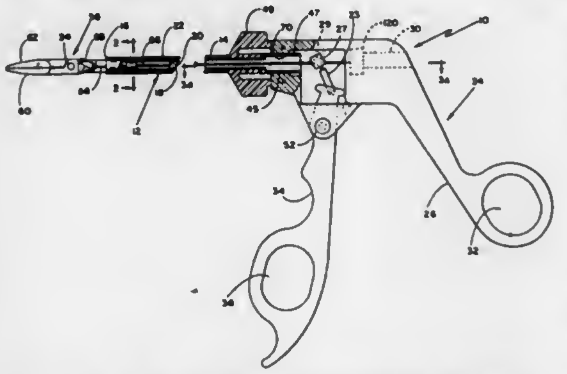
BIPOLAR ELECTROSURGICAL FORCEPS

Mark A. Rydell, Golden Valley, Minn., assignor to Everest Medical Corporation, Minneapolis, Minn.

Filed Feb. 5, 1993, Ser. No. 13,852

Int. Cl.^{6} A61B ***17/39***

U.S. Cl. 606—51 **3 Claims**



1. A hand operable bipolar forceps instrument comprising:

(a) an elongated tubular member having a proximal end, a distal end, and a lumen extending therebetween;

(b) two interfacing pivotable blade members disposed at the distal end of the tubular member, said blade members each being an electrode to which current can flow, and further wherein each blade member is individually pivotable in relation to the other blade member from an open position to a closed position;

(c) a handle disposed at the proximal end of the tubular member, said handle being in communication with the blade members and being hand operable to thereby produce pivotal action of the blade members; and

(d) means for journaling the proximal end of the elongated tubular member for rotation in the handle, rotation of the tubular member effecting rotation of the blade members relative to the handle.

5,462,547

TROCHANTER STABILIZATION DEVICE

Hans Weigum, Niederdorf, Switzerland, assignor to Synthes (U.S.A.), Paoli, Pa.

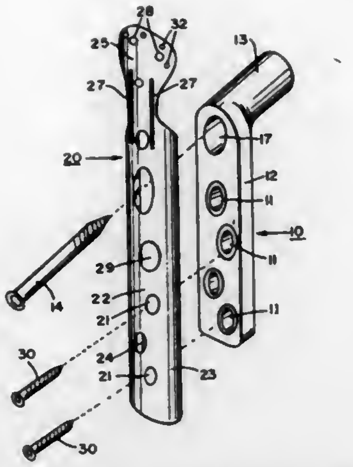
Filed May 21, 1992, Ser. No. 886,235

Claims priority, application Switzerland, May 30, 1991, 01602/91

Int. Cl.^{6} A61B ***17/56***

U.S. Cl. 606—65 **13 Claims**

1. Device for treating a bone having a shank and a joint area with a fracture in the joint area comprising a sleeve strap having a bone attachment leg for application directly to the shank of the bone, said bone attachment leg having apertures for facilitating attachment to the bone, and a sleeve, positioned at an angle to the bone attachment leg for receiving a connecting element for insertion into the joint area, in combination with a trochanter stabilization plate for separable connection with the bone attachment leg of said sleeve strap on the side of said attachment leg remote from the bone, said plate having a longitudinal part for positioning parallel to the bone attachment leg and a trochanter support part connected to said longitudinal part, said longitudinal part of the plate having its edges bent to form tracks for receiving the bone attachment leg and apertures corresponding to the apertures in the bone attachment leg whereby the plate and the bone attachment leg can be connected to the bone shank by common attachment devices.



5,462,548

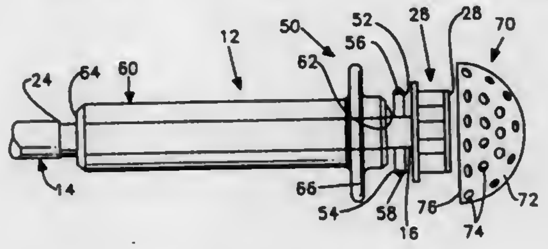
ACETABULAR REAMER

Michael J. Pappas, 61 Gould Pl., Caldwell, N.J. 07006, and Frederick F. Buechel, 76 Crest Dr., South Orange, N.J. 07079

Filed Jul. 6, 1992, Ser. No. 908,963

Int. Cl.^{6} A61B ***17/00***

U.S. Cl. 606—80 **11 Claims**



1. A surgical reamer, comprising:

shaft means for delivering rotatable driving forces;

reamer means selectively engageable and disengageable with the shaft means; and

gravitationally responsive locking means mounted to the shaft means for positively locking the reamer means to the shaft means when the surgical reamer is disposed in a first gravitational orientation and for unlocking the reamer means from the shaft means when the surgical reamer is disposed in a second gravitational orientation.

5,462,549

FEMORAL SIZING APPARATUS

Steven R. Glock, Fort Wayne, Ind., assignor to Biomet, Inc., Warsaw, Ind.

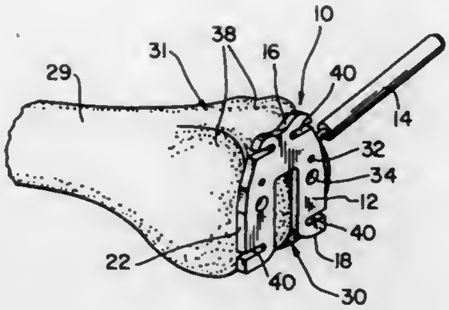
Filed May 1, 1992, Ser. No. 877,657

Int. Cl.^{6} A61F ***5/00***

U.S. Cl. 606—86 **20 Claims**

1. A femoral sizing apparatus for use by a surgeon in determining the appropriate femoral component size to be used in reconstructive surgery on the distal femur of a patient, said apparatus comprising:

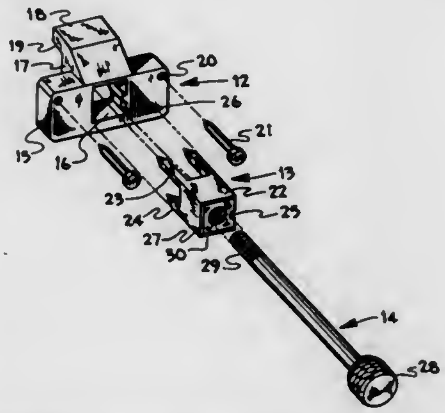
a plurality of plate means, each having a specific anterior to posterior first dimension and a medial to lateral second



dimension, for placement against the distal femur, each of said plurality of plate means corresponding to a specific femoral component size, and for viewing a projection of each plate means onto the distal femur and thereby determining the appropriate femoral component size.

5,462,550
ALIGNMENT GUIDE AND METHOD

Terry L. Dietz, Columbia City, and Stephen C. Miller, Warsaw, both of Ind., assignors to Zimmer, Inc., Warsaw, Ind.
Continuation of Ser. No. 929,241, Aug. 13, 1992, abandoned. This application Oct. 27, 1993, Ser. No. 143,910
Int. Cl.^{6} A61F *5/00;17/58*
U.S. Cl. 606—86 **14 Claims**



1. An apparatus for aligning a femoral knee implant with a prepared surface of a femur, the apparatus comprising:

a guide means for guiding the femoral knee implant to a desired location on the femur, the guide means being matingly engageable with the implant; and

a guide locator means for locating the guide means at a specific location on the femur, the guide locator means being matingly engageable with the guide means.

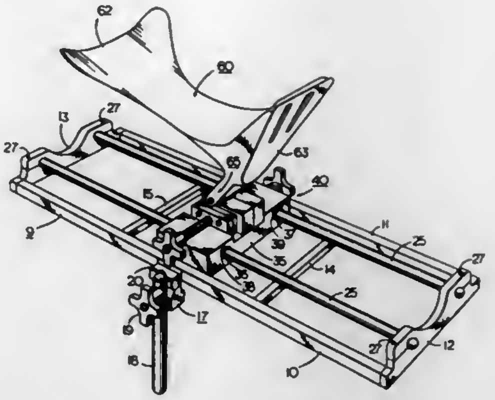
5,462,551
KNEE POSITIONER

James R. Bailey, Plainville; G. David Hood, Terryville, and Alan A. Wasley, Southington, all of Conn., assignors to Innovative Medical Products Inc., Plainville, Conn.
Filed Apr. 4, 1994, Ser. No. 222,591
Int. Cl.^{6} A61B *17/00*
U.S. Cl. 606—88 **2 Claims**

1. Apparatus for securing an extremity to an operating table for performing a surgical procedure comprising;

a base for securement to an operating table;

at least one elongated member supported on said base and adapted to be above the operating table;

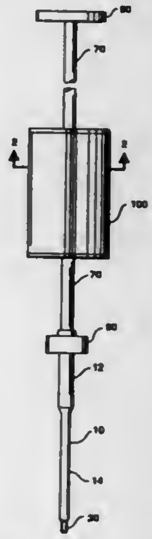


a holder for supporting a human joint upon which a surgical procedure is to be performed, said holder being generally an L-shaped member adapted to engage and support a lower leg and foot of a patient;

a carriage supported on said base for selective movement therealong, said holder being releasably engaged with said carriage by a selectively lockable ball and socket joint for movement therewith, and releasable locking means on said carriage for positioning said carriage on said at least one elongated member, said base comprises spaced end support members and said at least one elongated member comprises a pair of spaced generally parallel elongated members passing through openings in said carriage and secured at their ends to the spaced support members, said carriage thereby being supported on said pair of elongated members for sliding movement therealong.

5,462,552
BONE CEMENT REMOVAL AND APPARATUS

P. Douglas Kiester, 2806 Westgate Ave., Los Angeles, Calif. 90064
Continuation of Ser. No. 979,810, Nov. 20, 1992, abandoned. This application Jul. 15, 1994, Ser. No. 275,939
Int. Cl.^{6} A61F *7/00*
U.S. Cl. 606—92 **17 Claims**



1. An instrument assembly for removing, as a single piece, a mass of previously formed thermoplastic bone cement from a bone in a patient,

said instrument assembly being an elongate structure having proximal and distal ends and being constructed and configured to be grasped by the user during use, said elongate structure comprising;

a heater tip assembly forming the proximal end of the elongate structure, said heater tip assembly being constructed and configured to be inserted proximate a bone of a patient from which a mass of thermoplastic bone cement is to be removed and comprising:
  an elongate probe having proximal and distal ends; and
  an electrical resistivity heater tip rigidly mounted on the proximal end of said elongate probe;
a striker secured to the elongate probe distally from the heater tip;
an electrical system for supplying electricity to the heater tip assembly for heating the heater tip; and
hammer means, mounted for movement distally relative to the heater tip assembly, when the instrument is in use, for impacting the striker, the striker being so constructed and secured as part of the instrument assembly that force applied to the striker is applied through the instrument assembly to the heater tip assembly, said hammer means being constructed and configured for applying a removal force to the striker and through the instrument to the heater tip assembly;
the electrical system comprising electrical conductors and means for selectively connecting electricity through said electrical conductors to the heater tip, the electrical resistance of said conductors being so low relative to the electrical resistance of the heater tip that heating occurs substantially only in the heater tip;
the electrical system being constructed, configured and connected, when the instrument assembly is in use, as to heat the heater tip to a temperature sufficient to soften thermoplastic bone cement; the instrument being so constructed and configured as to permit the user to force the heated tip into the mass of thermoplastic bone cement to be removed from the patient and, after permitting the thermoplastic bone cement to cool to a solid, to impact the striker with the hammer means for apply a pulling force through the heater tip to the solid mass of thermoplastic bone cement in which the heater tip is embedded to thereby remove said mass of thermoplastic bone cement substantially as one piece from the patient;
said elongate structure comprising an elongate shaft having proximal and distal ends, the proximal end secured to the probe and the shaft extending from the distal end of the probe, and wherein the hammer means is slidably received on said shaft and the hammer means and probe, respectively, comprise electrical contacts for applying electricity to the heater tip only when said hammer means is positioned adjacent the distal end of said shaft.

5,462,553

SURGICAL SNARE WITH A FRANGIBLE LOOP

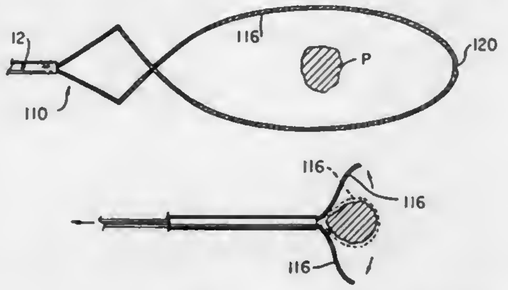
Stuart Dolgin, 95 Belvedere Dr., Syossett, N.Y. 11791

Continuation of Ser. No. 869,522, Apr. 15, 1992, Pat. No. 5,207,686. This application Dec. 22, 1992, Ser. No. 995,198

The portion of the term of this patent subsequent to May 4, 2010, has been disclaimed.

Int. Cl.^{6} A61B *17/36*

U.S. Cl. 606—113 **2 Claims**



1. In a surgical snare of the type including a sheath and a wire assembly slidably mounted within the sheath, the wire assembly being moved within the sheath as a result of its being manipulated by a user at a neat end thereof, the wire assembly being formed into an electrically conductive flexible wire loop at a distal end thereof, the loop being retractable substantially entirely into the sheath by virtue of its flexibility, the improvement comprising means responsive to the manipulation of the near end by the user for causing said loop to become discontinuous, whereby the snare may be removed from a patient when the loop becomes caught on a polyp.

5,462,554

EAR TAG APPLICATOR

Michael S. Gardner, 108 Waiatarua Road, Remuera, Auckland 1005, New Zealand

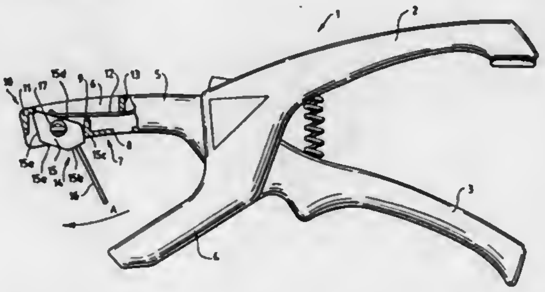
PCT No. PCT/GB92/01416, § 371 Date Mar. 31, 1994, § 102(e) Date Mar. 31, 1994, PCT Pub. No. WO93/02549, PCT Pub. Date Feb. 18, 1993

PCT Filed Jul. 31, 1992, Ser. No. 185,994

Claims priority, application New Zealand, Aug. 1, 1993, 239223

Int. Cl.^{6} A01K *11/00*

U.S. Cl. 606—117 **6 Claims**



1. An applicator for an animal ear tag comprising at least two pivotally connected handle members, said handle members being movable between fully open and closed positions, first and second jaws being respectively attached to said at least two pivotally connected handle members, a driving means being pivotally connected adjacent an end of said first jaw, elongate tag engagement means connected to said driving means and pivotal therewith from a first position in which said elongate tag engagement means is directed generally towards said second jaw and at least partially directed away from a line perpendicular with said first jaw and adjacent said end of said first jaw, and a second or spent position in which said elongate tag engagement means is directed generally outwardly from said end of said first jaw, and biasing means to bias said elongate tag engagement means in said first position during movement of the first and second jaws towards each other, said elongate tag engagement means being free to pivot relative to said first jaw when said handle members are in said fully open position and said elongate tag engagement means is in said first position.

5,462,555

UMBILICAL CORD CLIP AND APPLICATOR

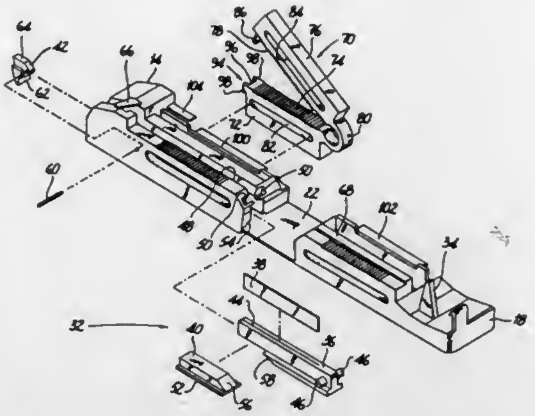
Henry Bolanos, East Norwalk; Ghaleb A. Sater, Shelton; Stephan A. DeFonzo, Bridgeport, all of Conn., and Wayne P. Young, Brewster, N.Y., assignors to United States Surgical Corporation, Norwalk, Conn.

Filed Dec. 30, 1993, Ser. No. 175,816

Int. Cl.^{6} A61B *17/12*

U.S. Cl. 606—120 **23 Claims**

1. A surgical instrument for clamping and severing an umbilical cord comprising:
  a) a first arm having a first clamping surface;
  b) a second arm movably affixed to said first arm and having a second clamping surface; and
  c) a severing mechanism mounted for movement with respect to said first and second arms, said severing mechanism at least



partially movable relative to said first and second arms solely in response to closure of said first and second arms about an umbilical cord to sever the umbilical cord clamped therebetween.

5,462,556

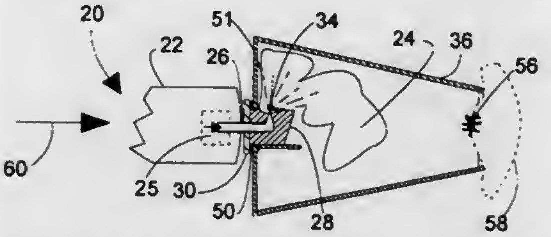
ECTOPARASITE REMOVER AND METHOD FOR REMOVING AN ECTOPARASITE FROM A HOST ORGANISM

William J. Powers, 2044 Hillsbury Rd., Westlake Village, Calif. 91361

Continuation-in-part of Ser. No. 80,777, Jun. 24, 1993, abandoned. This application Dec. 27, 1993, Ser. No. 174,151

Int. Cl.^{6} A61B *19/00*

U.S. Cl. 606—131 **35 Claims**



1. A remover for removing an ectoparasite from a host organism, comprising:

a receptacle having an open end;

plunger coupled to said receptacle and having a gas spraying orifices; and,

an anesthetizing gas producing means having anesthetizing gas and a pressure activated release valve coupled to said plunger for injecting said anesthetizing gas through said gas spraying orifice into said receptacle when pressure is applied by said plunger on said pressure activated release valve.

5,462,557

DISC-TYPE DEPILATION APPARATUS WITH FORCE TRANSMISSION STUDS

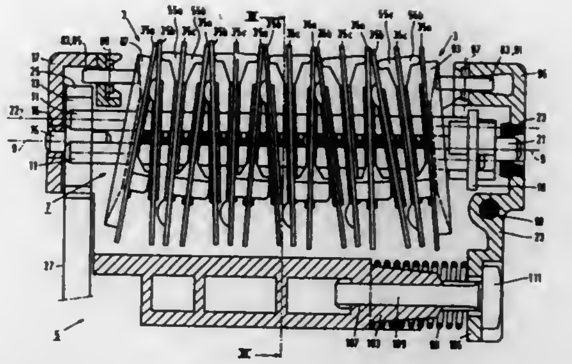
Hermann Jordan; Erich Krammer; Johann T. Rogatschnig, all of Klagenfurt, Austria; Petronella H. Den Ouden, and Francis J. Span, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 941,470, Sep. 8, 1992, abandoned. This application Jan. 3, 1994, Ser. No. 175,697

Claims priority, application European Pat. Off., Sep. 10, 1991, 91202301

Int. Cl.^{6} A45D *26/00*

U.S. Cl. 606—133 **24 Claims**



1. A depilation apparatus with pinching discs which are coupled to a drive shaft which is rotatable relative to a housing and extends parallel to a depilation opening of the housing, the apparatus comprising two outermost pinching discs and a plurality of inner pinching discs, each pinching disc being pivotable under the influence of a compression means about a pivot axis directed transverse to the drive shaft into a pinching position in which a pinching surface of said pinching disc and a pinching surface of an adjoining pinching disc exert a pinching force on one another near the depilation opening, wherein said pivot axis is determined by two pivot studs which are provided on at least one of mutually facing lateral surfaces of said pinching disc and said adjoining pinching disc, and wherein each inner pinching disc which is in the pinching position in conjunction with one of its two adjoining pinching discs is supported near its pinching surface by the other of said two adjoining pinching discs by means of a force transmission stud.

5,462,558

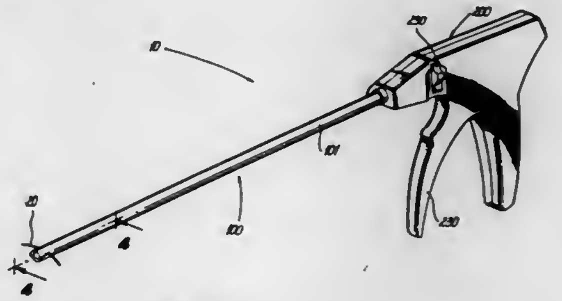
SUTURE CLIP APPLIER

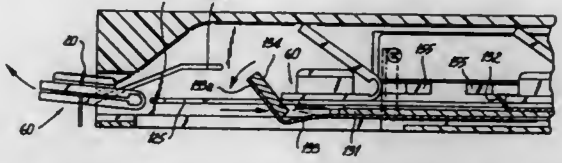
Michael S. Kolesa, Norwalk; Dominick L. Mastri, Bridgeport, both of Conn.; Wayne P. Young, Brewster, N.Y., and Henry Bolanos, East Norwalk, Conn., assignors to United States Surgical Corporation, Norwalk, Conn.

Filed Aug. 29, 1994, Ser. No. 297,333

Int. Cl.^{6} A61B *17/04*

U.S. Cl. 606—139 **15 Claims**





1. An apparatus for applying a suture clip to a suture, which comprises:

a) an endoscopic portion having suture receiving means to position a suture transversely to the longitudinal axis of the endoscopic portion, closing means for closing a clip onto a suture positioned within said suture receiving means, pusher means for advancing a suture clip into said closing means, and a tubular housing for enclosing said closing means and said pusher means; and

b) a handle portion including a handle portion housing, and actuation means for actuating said pusher means.

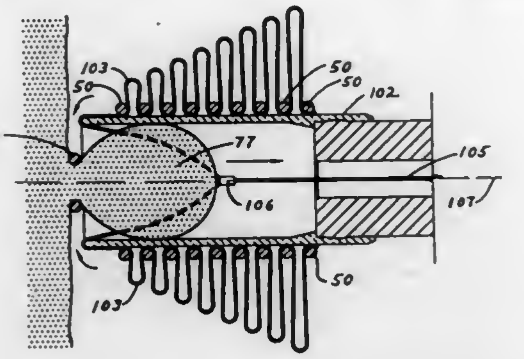
5,462,559
ENDOSCOPIC LIGATING INSTRUMENT

Munir Ahmed, 501 Haltiwanger, Apt. a-2, Greenwood, S.C. 29649

Continuation-in-part of Ser. No. 21,036, Feb. 23, 1993, Pat. No. 5,320,630. This application Jun. 14, 1994, Ser. No. 260,380

Int. Cl.⁶ A61B *17/00*

U.S. Cl. 606—140 **7 Claims**



1. A flexible endoscopic instrument for ligating a multiplicity of lesions within a hollow body organ, such as the alimentary tract, said instrument comprising:

(a) a flexible fiber optic endoscope having a forward insertion end and a rearward end, said endoscope including means for illumination and viewing through said endoscope, means for providing a suction force at said insertion end, and a working channel;

(b) a tubular member having a forward distal end, a rearward end and a longitudinal axis, said rearward end having means for providing attachment to the insertion end of the endoscope;

(c) a plurality of string-like cords of flexible substantially inelastic material, each said cord being folded over the distal end of the tubular member with a first portion of each said cord overlaying a part of the exterior of said tubular member and a second portion thereof being disposed internally of said tubular member, said cords being oriented in angular spacing about the longitudinal axis of said tubular member;

(d) a plurality of elastic ligating rings removably mounted in stretched condition on said tubular member in coaxial relation thereto and each of said rings being in overlying contacting relation to all of said plurality of cords, said rings being spaced from one another in the longitudinal direction of the tubular member at successively greater different distances from the distal end of the tubular member; and

(e) means for imparting relative sliding motion between said cords and said tubular member to dislodge each of the elastic rings in controlled sequence during a single insertion of the endoscope into the body organ whereby each of the elastic rings can be dislodged from the endoscope and placed in ligating relation to a lesion when lesion tissue is drawn into the tubular member by said suction means with each ring being applied to a different one of multiple lesions present in the body organ, said means for imparting relative sliding motion comprising a flexible line element threaded through the working channel of the endoscope and connecting at one end to said cords disposed within said tubular member and exiting the endoscope at the rearward end thereof whereby a pulling force may be exerted on the other end of the line element to cause sliding movement of the cords over said tubular member, each said cord being arranged in slack condition between each pair of adjacent elastic rings.

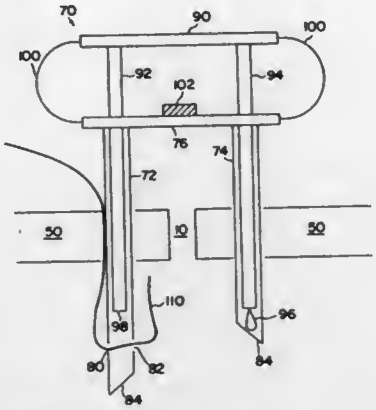
5,462,560
DOUBLE NEEDLE LIGATURE DEVICE

Jon A. Stevens, Hayward, Calif., assignor to Tahoe Surgical Instruments

Filed Oct. 8, 1993, Ser. No. 134,263

Int. Cl.⁶ A61B *17/00*

U.S. Cl. 606—144 **9 Claims**



1. A ligature device including:

(1) a needle assembly comprising

(a) needle support means for holding needles;

(b) first and second hollow needles, each of said needles having a shaft, a proximal end, a distal end, and a sharpened distal tip, said needles being mounted on said needle support means at their proximal ends and extending substantially parallel to one another from said support means; and

(c) first suture support means for slidably supporting a suture comprising a transverse passage across said shaft of said first needle; and

(2) a rod assembly comprising

(a) rod support means for holding rods;

(b) first and second rods, each of said rods having a shaft, a proximal end, and a distal end, said rods being mounted on said rod support means at their proximal ends and extending substantially parallel to one another from said rod support means,

(c) a filament loop, positioned at said distal end of said second rod;

said rod assembly being slidably engaged with said needle assembly such that said first and second rods are positioned within said first and second needles respectively and said rod assembly is movable with respect to said needle assembly from a rod extended position to a rod retracted position, and, when said rod assembly is in said rod extended position, said distal end of said first rod extends past said transverse passage and said filament loop extends past said distal end of said second needle.

5,462,561
SUTURE DEVICE

Jan K. Voda, 1404 Camden Way, Oklahoma City, Okla. 73116

Filed Aug. 5, 1993, Ser. No. 102,575

Int. Cl.⁶ A61B *17/00*

U.S. Cl. 606—144 **41 Claims**

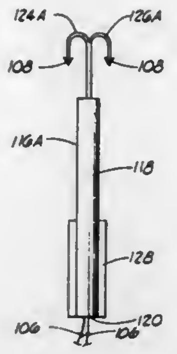
1. An apparatus for suturing a perforation in a side wall of a patient's blood vessel, comprising:

an outer sheath having a longitudinal passage defined therethrough, said outer sheath being insertable through the perforation in the patient's blood vessel;

a first combination suture point and anchor;

a first suture thread connected to said first combination suture point and anchor;

carrier means for carrying said first combination suture point and anchor in a distal direction through said longitudinal



passage of said outer sheath into the patient's blood vessel and for pulling said first combination suture point and anchor in a proximal direction through the side wall of the patient's blood vessel so that said first combination suture point and anchor is anchored against being pulled back through said side wall in a distal direction;

a second combination suture point and anchor;

a second suture thread connected to said second combination suture point and anchor; and

wherein said carrier means further provides a means for carrying said second combination suture point and anchor in said distal direction through said longitudinal passage of said outer sheath into the patient's blood vessel and for pulling said second combination suture point and anchor in said proximal direction through the side wall of the patient's blood vessel at a circumferentially spaced position around said perforation from said first combination suture point and anchor.

5,462,562

SUTURE PASSER AND METHOD OF USING

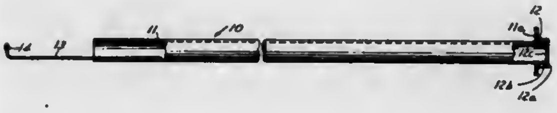
Robert M. Elkus, West Bloomfield, Mich., assignor to Henry Ford Hospital, Detroit, Mich.

Continuation-in-part of Ser. No. 63,001, May 17, 1993, abandoned. This application Jan. 11, 1994, Ser. No. 179,987

Int. Cl.^{6} A61B *17/00*

U.S. Cl. 606—148 **18 Claims**

1. A suture passer comprising



a cylinder having a proximal end and a distal end and defining a single opening,

a gasket of flexible resilient material at said proximal end to provide a seal through which a laparoscopic forceps may be inserted,

said opening of said cylinder having a cross-sectional area sufficient to permit passing a laparoscopic forceps,

said cylinder including a thin guide fastened in the opening of the cylinder at the distal end of the cylinder,

said guide having a lateral arm extending radially inwardly,

said guide and said arm lying in a diametral plane of said cylinder,

said lateral arm including an eye adjacent said free end through which a suture is passed for use,

said free end of said lateral arm of said guide terminating within the projection of said opening.

5,462,563

ORTHOPAEDIC IMPLANT

John R. Shearer, Southampton, and Philip Shelley, Sheffield, both of, England, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

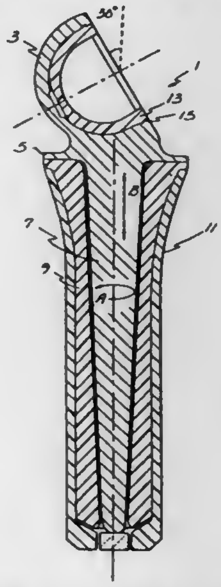
Continuation of Ser. No. 35,906, Mar. 23, 1993, abandoned, which is a continuation of Ser. No. 822,619, Jan. 17, 1992, abandoned. This application Sep. 20, 1994, Ser. No. 308,945

Claims priority, application United Kingdom, Jan. 17, 1991, 9101008

Int. Cl.^{6} A61F *2/40*

U.S. Cl. 623—18 **16 Claims**

1. A humeral implant of the type that locates the head of a glenoid prosthesis relative to a patient's humerus, the implant comprising:



a socket cup having an opening adapted to receive the head of the glenoid prosthesis, the opening of the socket cup defining a diametrical plane;

an elongate stem connected to the socket cup, with the diametrical plane of the socket cup disposed at an angle to the longitudinal axis of the stem; and

an elongate sleeve adapted to receive the elongate stem and allow rotary and axial movement of the elongate stem within the sleeve such that the opening and the diametrical plane of the socket cup face in different directions as the stem rotates, thereby permitting substantially greater rotation of the elongate stem relative to the head of the glenoid prosthesis than would be the case if the elongate stem were not permitted to rotate within the sleeve, the sleeve being adapted to be inserted and secured within the humerus of the patient.

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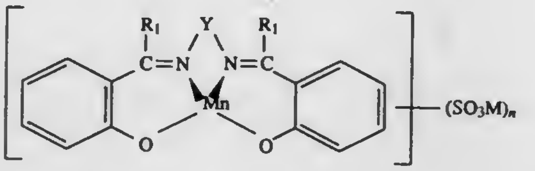
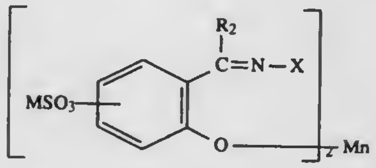
INHIBITION OF RE-ABSORPTION OF MIGRATING DYES IN THE WASH LIQUOR

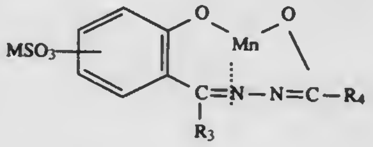
Claude Eckhardt, Riedisheim, France, and Dieter Reinehr, Kandern, Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jun. 14, 1994, Ser. No. 259,651
Claims priority, application United Kingdom, Jun. 19, 1993, 9312693; Dec. 8, 1993, 9325117
Int. Cl.^{6} C11D *3/30;3/395;7/10;* **D06L** *3/02*
U.S. Cl. 8—111 **24 Claims**

1. A process for inhibiting the re-absorption of migrating dyes in a wash liquor containing migrating dyes, comprising introducing into a wash liquor containing a peroxide-containing detergent, from 0.5 to 150 mg, per liter of wash liquor, of one or more compounds having the formula (1), (2), (3), (4), (5), (6) or (7):


(1)


(2)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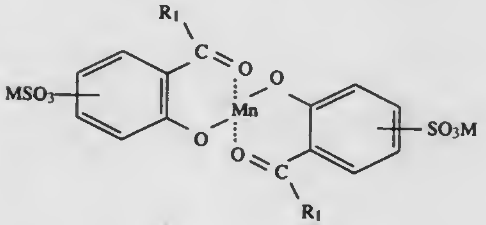
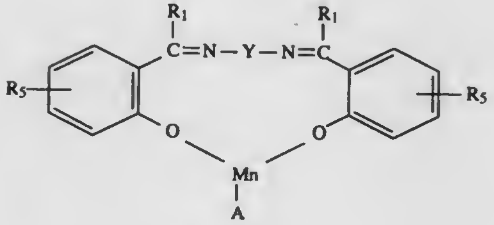

(4)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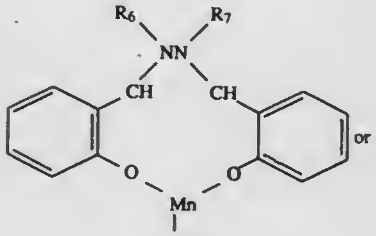
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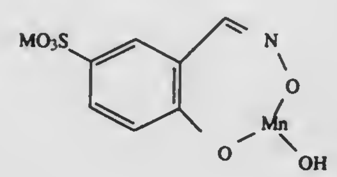
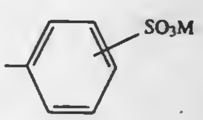
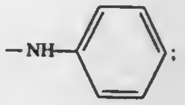

(7)

in which R_1, R_2, R_3 and R_4 are the same or different and each is hydrogen or optionally substituted alkyl, cycloalkyl or aryl; R_5 is hydrogen, alkyl or SO_3M; R_6 and R_7 are the same or different and each is NH—CO—NH_2, a group of formula

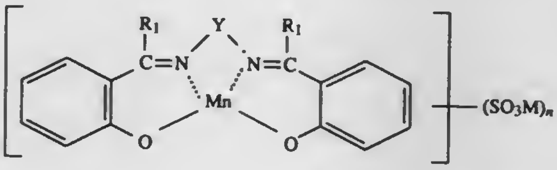


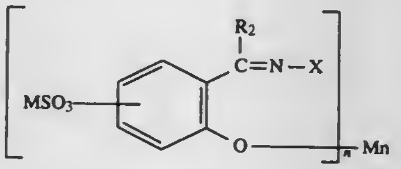
or a group of formula



Y is optionally substituted alkylene or cyclohexylene; X is OH, NH_2, optionally substituted aryl or optionally substituted alkyl; n is 0, 1, 2 or 3; M is hydrogen, an alkali metal atom, ammonium or a cation formed from an amine; m is 0 or 1; and A is an anion.

11. A detergent composition comprising:
i) 5–90% of A) an anionic surfactant and/at B) a nonionic surfactant;
ii) 5–70% of C) a builder;
iii) 0.1–30% of D) a peroxide; and
iv) 0.005–2% of E) a compound of formula (1), (2), (3), (4), (5), (6) or (7)


(1)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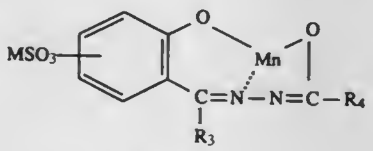
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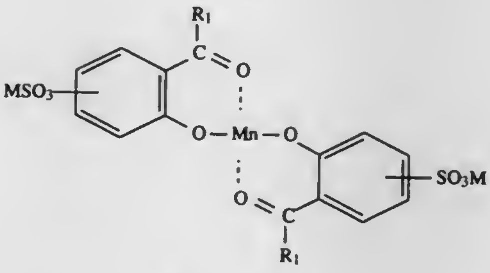
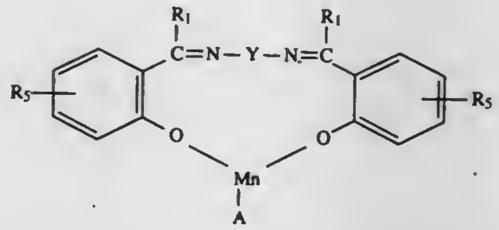

(4)


(5)

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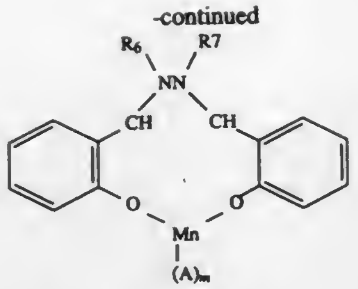
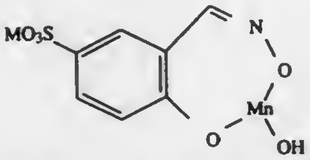
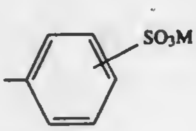


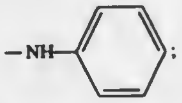


(7)

in which R_1, R_2, R_3 and R_4 are the same or different and each is hydrogen or optionally substituted alkyl, cycloalkyl or aryl; R_5 is hydrogen, alkyl or SO_3M; R_6 and R_7 are the same or different and each is NH—CO—NH_2 a group of the formula



or a group of the formula



;

Y is optionally substituted alkylene or cyclohexylene; X is OH, NH_2, optionally substituted aryl or optionally substituted alkyl; n is 0, 1, 2 or 3; M is hydrogen, an alkali metal atom, ammonium or a cation formed from an amine; m is 0 or 1; and A is an anion.

5,462,565

PROCESS FOR DYEING DELUSTERED POLYAMIDE FIBERS WITH ACID DYESTUFFS AND METAL SALTS

Jürgen Rohr, Langenfeld; Martin Riegels, Hilden, and Sylvia Lohmann, Emmerthal, all of, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation of Ser. No. 58,551, May 5, 1993, abandoned. This application Sep. 8, 1994, Ser. No. 302,556

Claims priority, application Germany, May 12, 1992, 42 15 589.4

Int. Cl.^{6} C09B *67/24;* **D06P** *3/24*

U.S. Cl. 8—531 **17 Claims**

1. A process for improving the colorfastness of polyamide fibers delustered by the addition of titanium dioxide pigments and dyed with acid dyestuffs, which comprises dyeing polyamide fibers, having a fiber thickness of 0.6 to 1.2 dtex and containing titanium dioxide pigments, with acid dyestuffs, wherein a small amount of a salt of nickel, zinc, cobalt, zirconium or manganese is added to the dyebath in an amount of 0.1 to 1 g/l.

5,462,566

HIGH CAPACITY CATHODES FOR SECONDARY CELLS

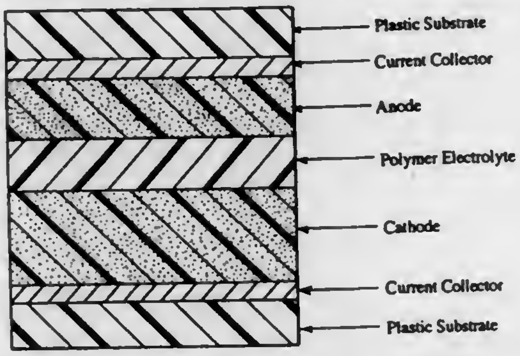
(6) **Terje A. Skotheim, Shoreham, N.Y., assignor to Moltech Corporation, Stony Brook, N.Y.**

Division of Ser. No. 78,460, Jun. 16, 1993. This application Jul. 6, 1994, Ser. No. 271,097

Int. Cl.^{6} H01M *4/04*

U.S. Cl. 29—623.1 **12 Claims**

1. A method of forming a composite cathode which comprises:



coating an electrically conducting cathode substrate with a mixture comprising an amount of poly(carbon disulfide) effective to provide cathode activity, an amount of a p-doped conjugated polymer effective to transport electrons and enhance voltage against an anode, and an amount of an electrolyte effective to transport ions.

5,462,567

FUEL ADDITIVE COMPOSITIONS CONTAINING POLY(OXYALKYLENE)HYDROXYAROMATIC ESTERS AND ALIPHATIC AMINES

Richard E. Cherpeck, Cotati, Calif., assignor to Chevron Chemical Company, San Ramon, Calif.

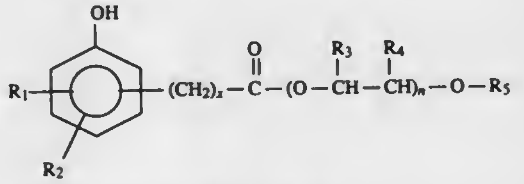
Filed Dec. 28, 1992, Ser. No. 997,978

Int. Cl.^{6} C10L *1/22;1/18*

U.S. Cl. 44—347 **51 Claims**

1. A fuel additive composition comprising:

(a) a poly(oxyalkylene) hydroxyaromatic ester having the formula:



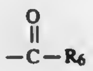
$$R_1-C_6H_2(OH)(R_2)-(CH_2)_x-\overset{\overset{\displaystyle O}{\|}}{C}-(O-\overset{\overset{\displaystyle R_3}{|}}{CH}-\overset{\overset{\displaystyle R_4}{|}}{CH})_n-O-R_5$$

or a fuel-soluble salt thereof; wherein

R_1 and R_2 are each independently hydrogen, hydroxy, lower alkyl having 1 to 6 carbon atoms, or lower alkoxy having 1 to 6 carbon atoms;

R_3 and R_4 are each independently hydrogen or lower alkyl having 1 to 6 carbon atoms;

R_5 is hydrogen, alkyl having 1 to 30 carbon atoms, phenyl, aralkyl or alkaryl having 7 to 36 carbon atoms, or an acyl group having the formula:



$$-\overset{\overset{\displaystyle O}{\|}}{C}-R_6$$

wherein R_6 is alkyl having 1 to 30 carbon atoms, phenyl, or aralkyl or alkaryl having 7 to 36 carbon atoms;

n is an integer from 5 to 100; and x is an integer from 0 to 10; and

(b) an aliphatic substituted amine having at least one basic nitrogen atom and containing an aliphatic hydrocarbyl group which has sufficient molecular weight and carbon chain length to render the aliphatic substituted amine soluble in hydrocarbons boiling in the gasoline or diesel fuel range.

5,462,568

STONE POLISHING COMPOSITION

Joseph M. Donatelli, Jr., Scotch Plains, N.J., assignor to Ronald C. Wiand, Troy, Mich.

Continuation of Ser. No. 851,425, Mar. 13, 1992, abandoned.
This application Mar. 14, 1994, Ser. No. 212,306
Int. Cl.^{6} B24B *7/22*

U.S. Cl. 51—309 **12 Claims**

1. A process for polishing a marble, stone or granite surface comprising the steps of:

a) applying a polishing mixture comprising an abrasive constituent and a Group Ia or Group IIa metal ion source to said surface to be polished;

b) working said mixture against said surface for forming a crystal formation of said alkali group metal ion on said surface during polishing thereof.

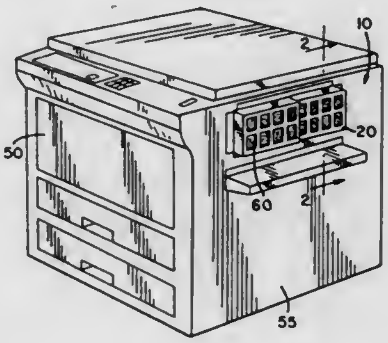
5,462,569

RETRO-FIT FILTER UNIT FOR AIR INTAKES TO ELECTRO-MECHANICAL MACHINES

Stanley Benjamin, 9048 N. Lamon, Skokie, Ill. 60077

Filed Sep. 1, 1993, Ser. No. 114,158
Int. Cl.^{6} B01D *46/00*

U.S. Cl. 55—385.6 **7 Claims**



1. A filter unit for preventing particulate matter from entering an air intake vent in a machine housing of a machine, said filter unit comprising:

an air filter;

a filter housing for removably receiving said air filter; and

attachment means for removably attaching said filter housing to said machine housing in a location such that said filter extends over the entire air intake vent of said machine housing;

said filter housing comprises two parts placed end to end collectively forming four side walls, said four side walls each having a length, a near edge and a far edge, a mounting flange extending perpendicularly outward from each said near edge of said four side walls along said length thereof, a top flange extending perpendicularly inward from each said far edge of said four side walls along said length thereof, and a housing cover having at least one opening mounted to said top flanges, said attachment means placed in association with said mounting flanges;

said filter being removable from said filter housing upon detaching one of said two parts of said filter housing from said machine housing.

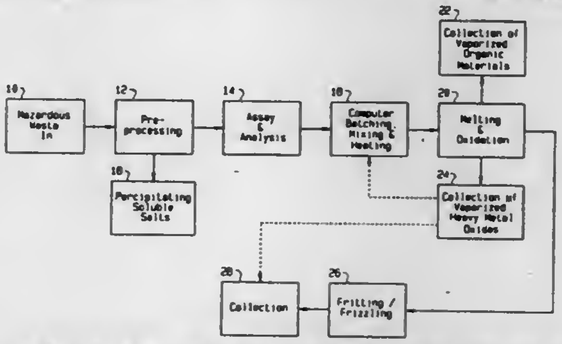
5,462,570

PROCESS FOR PRODUCING AN ENVIRONMENTALLY ACCEPTABLE ABRASIVE PRODUCT FROM HAZARDOUS WASTES

Gerald P. Balcar, Newfoundland, N.J., and Anurag Dwivedi, Corning, N.Y., assignors to International Enviromelting Corporation, West Milford, N.J.

Division of Ser. No. 9,225, Jan. 26, 1993, Pat. No. 5,273,566.
This application Oct. 5, 1993, Ser. No. 131,543
Int. Cl.^{6} C03B *1/00*

U.S. Cl. 65—17.1 **16 Claims**


10
Hazardous Waste In
12
Pre-processing
14
Assay & Analysis
18
Computer Batching, Mixing & Heating
20
Melting & Oxidation
22
Collection of Vaporized Organic Materials
16
Percipitating Soluble Salts
24
Collection of Vaporized Heavy Metal Oxides
28
Collection
26
Fritting / Frizzling

1. A process of manufacturing an abrasive, which comprises the steps of:

(a) grouping a volume of material into lots having different chemical compositions for batching;

(b) mixing lots with glass-making materials to form a batch mixture;

(c) melting the batch mixture to form a molten glasseous substance which comprises the following components by weight:

Silica	48 to 56 percent
Alumina	18 to 30 percent
Sodium Oxide	6 to 12 percent
Calcium Oxide and Magnesium Oxide	6 to 12 percent
Iron Oxide	2 to 4 percent
Lead Oxide	0.1 to 1 percent; and

(d) fritting said glasseous substance to form said abrasive.

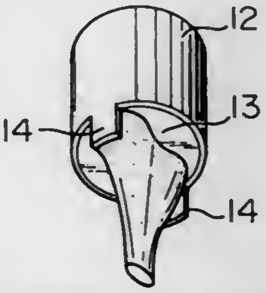
5,462,571

NOZZLE TIP FOR SPINNING GLASS FIBER HAVING DEFORMED CROSS-SECTION AND A PLURALITY OF PROJECTIONS

Hideo Taguchi, Nihonmatsu; Kozo Shioura, and Miwa Sugeno, both of Fukushima, all of, Japan, assignors to Nitto Boseki Co., Ltd., Fukushima, Japan

Filed Dec. 3, 1993, Ser. No. 162,440
Claims priority, application Japan, Dec. 7, 1992, 4-326677
Int. Cl.^{6} C03B *37/022*

U.S. Cl. 65—437 **9 Claims**



1. A nozzle tip for spinning a glass fiber having a non-circular cross-section wherein said

tip has a closed outer perimeter at a distal end thereof;

- a plurality of projections depending only axially from said closed outer perimeter, each of said projections being formed with a flat lower end; and
- at least one orifice being disposed within said tip.

5,462,572

METHOD AND A DEVICE FOR STIRRING A MOLTEN METAL

Göte Tallbäck, Västerås, Sweden, assignor to Asea Brown Boveri AB, Vasteras, Sweden

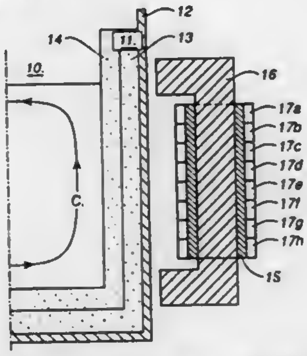
PCT No. PCT/SE93/00556, § 371 Date Jan. 11, 1995, § 102(e) Date Jan. 11, 1995, PCT Pub. No. WO94/03294, PCT Pub. Date Feb. 17, 1994

PCT Filed Jun. 23, 1993, Ser. No. 362,600

Claims priority, application Sweden, Aug. 7, 1992, 9202308

Int. Cl.^{6} B22D *1/00*

U.S. Cl. 75—10.16 **11 Claims**



1. A method of inductively stirring a molten metal contained in a container having a wall with at least one layer of a magnetic material, comprising the steps of:

- applying at least one magnetic direct field to at least part of said wall such that an anisotropically directed magnetic saturation is obtained in said part of the wall in the direction of saturation thereof and which is substantially oriented in the plane of the wall and essentially parallel to the desired stirring direction,
- applying a low-frequency magnetic travelling alternating field superposed on the magnetic direct field, said alternating field comprises components substantially located in a plane oriented parallel to said saturation direction and perpendicular to the plane of the wall, and
- said low-frequency magnetic alternating field passes through the saturated part of said container to form a stirrer field which provides the desired circulation in the melt.

5,462,573

VALVE SEAT INSERTS OF SINTERED FERROUS MATERIALS

Andrew R. Baker, Lighthorn, and Richard L. Kettle, Hinckley, both of, England, assignors to Brico Engineering Limited, Coventry, England

Continuation of Ser. No. 854,783, Mar. 23, 1992, abandoned, which is a continuation of Ser. No. 567,107, Aug. 14, 1990, abandoned, which is a division of Ser. No. 254,169, Oct. 6, 1988, Pat. No. 4,970,049. This application Jan. 21, 1994, Ser. No. 188,631

Claims priority, application United Kingdom, Jan. 10, 1987, 8723818

Int. Cl.^{6} C22C *38/24*

U.S. Cl. 75—231 **6 Claims**

1. A valve seat insert for an internal combustion engine cylinder head consisting of a sintered ferrous-based material having a matrix comprising a pressed and sintered powder, the metallurgical structure of the matrix comprising tempered martensite containing spheroidal alloy carbides, bainite and ferrite, the powder having been pressed to greater than 80% of theoretical density from a mixture including two different ferrous-based powders, the mixture consisting essentially of between 40 and 70 wt % of a pre-alloyed powder having a composition in wt %, apart from impurities, within the ranges of: carbon 0.45–1.05/tungsten 2.7–6.2/molybdenum 2.8–6.2/vanadium 2.8–3.2/chromium 3.8–4.5/iron balance, with between 60 and 30 wt % of an iron powder and carbon powder, and optionally copper in the amount of 4 to 6 wt % if present, optionally up to 5 wt % of one or more metallic sulfides, and optionally up to 1 wt % sulphur as elemental sulphur or pre-alloyed in said pre-alloyed powder, the final composition being such that the total carbon content of the sintered material lies in the range from 0.8 to 1.5 wt %.

5,462,574

SINTERED CARBONITRIDE ALLOY AND METHOD OF PRODUCING

Niclas During, Upplands Vasby, and Gerold Weinl, Alvsjo, both of, Sweden, assignors to Sandvik AB, Sandviken, Sweden

Filed Jun. 16, 1993, Ser. No. 77,683

Claims priority, application Sweden, Jul. 6, 1992, 9202091

Int. Cl.^{6} C22C *29/04*

U.S. Cl. 75—238 **4 Claims**

1. A sintered titanium-based carbonitride alloy for metal cutting purposes containing hard constituents based on Ti, Zr, Hf, V, Nb, Ta, Cr, Mo and/or W with a nitrogen content satisfying the relation N/(C+N)<0.5 and 3–30% binder phase based on Co and/or Ni, said hard constituents including well-dispersed Ti-rich hard constituent grains without a core-rim structure and metal carbonitride constituent grains having a core-rim structure, said alloy containing 10–50% by weight of said well-dispersed Ti-rich hard constituent grains having a mean grain size of 0.8–5 μm in a matrix of said metal carbonitride constituent grains having a mean grain size of 1–2 μm, said Ti-rich hard constituent grains being essentially rounded, non-angular grains with an approximately logarithmic normal grain size distribution with a standard deviation of <0.23 logarithmic μm.

5,462,575

CO-CR-MO POWDER METALLURGY ARTICLES AND PROCESS FOR THEIR MANUFACTURE

Gregory J. Del Corso, Sinking Spring, Pa., assignor to CRS Holding, Inc., Wilmington, Del.

Filed Dec. 23, 1993, Ser. No. 173,343

Int. Cl.^{6} C22C *19/07;* **B22F** *3/14*

U.S. Cl. 75—243 **18 Claims**

12. A substantially fully dense, powder metallurgy article, formed from a Co—Cr—Mo alloy powder having a composition in weight percent of about:

	%
Carbon	0.35 max.
Manganese	1.00 max.
Silicon	1.00 max.
Chromium	26.0-30.0
Molybdenum	5.0-7.0
Nickel	3.00 max.
Nitrogen	0.25 max.
Iron	1.00 max.
Oxide Forming Metals	0.01 max.
Cobalt	Balance

wherein the amounts of carbon and nitrogen in said alloy satisfy the relationship:

$$.866+360.93\times(\%C)+.633\times(\%N)-.165\times(\%C)^2-641.702\times(\%N)^2\geqq 120.$$

5,462,576

HEAVY METAL ALLOY AND METHOD FOR ITS PRODUCTION

Peter Stuitje, Vught/NL; Ronald Harkema, Eindhoven/NL, and Cornelie Taal, Krp/NL, all of, Netherlands, assignors to NWM de Kruithoorn B.V., JX 's-Hertogenboch, Netherlands

Filed Jun. 6, 1994, Ser. No. 254,876

Claims priority, application Germany, Jun. 7, 1993, 43 18 827.3

Int. Cl.^{6} C22C *27/04*; B22F *3/00*

U.S. Cl. 75—248 **15 Claims**

1. A heavy metal alloy comprising from about 85 to 98 weight-% tungsten present in the form of a globular tungsten grains, and nickel and cobalt in a Ni/Co weight ratio approximately between 1.6 and 3.5 as binder elements in an austenitic binder phase which also contains tungsten in solid solution, said binder phase also containing tungsten precipitates which are finer-grained than the globular tungsten grains and which are uniformly distributed.

5,462,577

WATER-ATOMIZED IRON POWDER AND METHOD

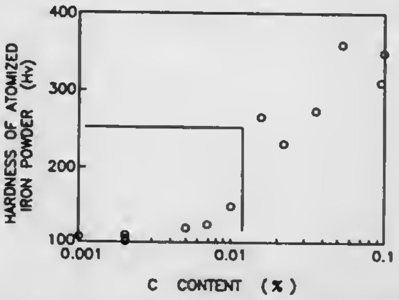
Kuniaki Ogura; Hiroyuki Ishikawa; Yoshiaki Maeda, and Kouichi Komamura, all of Chiba, Japan, assignors to Kawasaki Steel Corporation, Japan

Filed May 18, 1994, Ser. No. 243,997

Claims priority, application Japan, May 18, 1993, 5-115523; Aug. 6, 1993, 5-196170; Jan. 14, 1993, 5-256807

Int. Cl.^{6} B22F *1/00*

U.S. Cl. 75—345 **11 Claims**



1. In a method of manufacturing water-atomized iron powder for powder metallurgy from molten steel composed of C: about 0.02 wt. % or less, Mn: about 0.30 wt. % or less, Ni: about 0.30 wt. % or less, Cr: about 0.30 wt. % or less, a total of other impurities: about 0.50 wt. % or less and the balance of Fe, the steps which comprise:

atomizing said molten steel with a water jet having a pressure of from about 40 kgf/cm^2 or higher to about 200 kgf/cm^2 or lower,

drying said atomized molten steel, and

forming said steel into a green compact without an intervening heat treatment.

5,462,578

METHOD FOR THE EXTRACTION OF THE METALLIC PHASE FROM DISPERSED MIXTURES OF LIGHT METALS AND NONMETALLIC COMPONENTS

Bernd Kos, Endresgasse 11, and Harald Marhold, Stolienweg 11/10, both of A-8700 Leoben, Austria

Filed May 23, 1994, Ser. No. 247,843

Claims priority, application Austria, May 24, 1993, 1003/93

Int. Cl.^{6} C22B *9/02*

U.S. Cl. 75—404 **30 Claims**

1. A method for the extraction of the metallic phase from a dispersed mixture comprised of one of a light metal and an alloy of light metals and from a nonmetallic phase, formed of at least of one of an oxide and an oxide of an alloy and other nonmetallic combinations of said light metals, at temperatures above the ambient temperature, the method comprising:

at least one of bringing, holding and equalizing the temperature of the dispersed mixture to a temperature in the region above one of the melting temperature and melting range of one of the metal and the alloy;

bringing the mixture to temperature controllable, coolable contact areas, of a disintegrating apparatus, having ingot mold contact areas;

subjecting the mixture to disintegration via an acceleration that is essentially perpendicular relative to the contact areas;

coalescing the metallic phase in one of on and in the region of the contact areas;

collecting the metallic phase under the influence of the contact areas; and

permitting the metallic phase to proceed to solidification.

5,462,579

METHOD AND APPARATUS FOR MANUFACTURING MEDIUM OR LOW CARBON FERROMANGANESE

Hiroshi Narahara, and Kouji Suzuki, both of Kurashiki, Japan, assignors to Mizushima Ferroalloy Co., Ltd., Japan

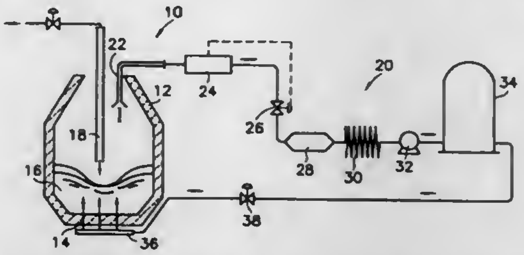
PCT No. PCT/JP93/01476, § 371 Date Sep. 14, 1994, § 102(e) Date Sep. 14, 1994, PCT Pub. No. WO94/26946, PCT Pub. Date Nov. 24, 1994

PCT Filed Oct. 14, 1993, Ser. No. 302,820

Claims priority, application Japan, May 18, 1993, 5-116059

Int. Cl.^{6} C22B *47/00*

U.S. Cl. 75—624 **8 Claims**



1. A method for manufacturing medium or low carbon ferromanganese wherein medium or low carbon ferromanganese is manufactured by decarburizing molten high carbon ferromanganese in a converter which provides a top lance and bottom tuyeres, comprising blowing oxygen gas through said top lance on the surface of said molten high carbon ferromanganese, and, at the same time, injecting through said bottom tuyeres a mixed gas whose composition comprises 65– 100% of CO gas, 0–25% of CO_2 gas and 0–10% of N_2 gas, into said molten high carbon ferromanganese at a ratio of 12–30 parts by volume per 100 parts by volume of the oxygen gas calculated as the standard state of the blown oxygen gas.

5,462,580

METHOD FOR MOLTEN METAL TREATMENT

C. Edward Eckert, 260 Lynn Ann Dr., New Kensington, Pa. 15068

Continuation-in-part of Ser. No. 91,608, Jul. 13, 1993, Pat. No. 5,364,450. This application Oct. 3, 1994, Ser. No. 316,790

Int. Cl.^{6} C22B *9/05*;*21/06*

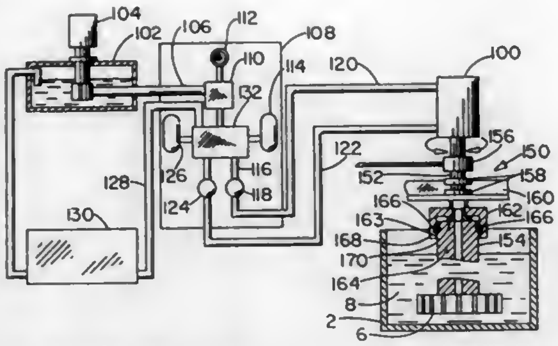
U.S. Cl. 75—678 **21 Claims**

1. An improved method for dispersing a media in a body of molten metal using an impeller to disperse the media in the body of molten metal, the method producing increased shear forces in the body of molten metal and reducing vortex formation, the method comprising the steps of:

(a) providing a body of molten metal;

(b) projecting an impeller on a shaft in said body;

(c) adding media to said body; and



(d) dispersing said media by:
  - (i) rotating said impeller in one direction; and thereafter
  - (ii) reversing the direction of rotation of said impeller to a counter direction, said rotating accomplished by use of a hydraulic motor having a hydraulic motor shaft joined to said shaft of said impeller by a connection, said connection formed by said hydraulic motor shaft terminating in a cup-shaped member having said shaft of said impeller inserted into said cup-shaped member and locked therein, said cup-shaped member formed from a metallic material having a coefficient of expansion in the range of 2×10^{-6} in/in/°F. to 8×10^{-6} in/in/°F.;
  - (iii) the direction of rotation of said impeller being reversed periodically to substantially reduce formation of a vortex around the shaft of said impeller and to provide increased shear forces in said body for purposes of improving treatment of said molten metal by improved dispersion of said media therein.

5,462,581

METHOD FOR TREATING MOLTEN METAL

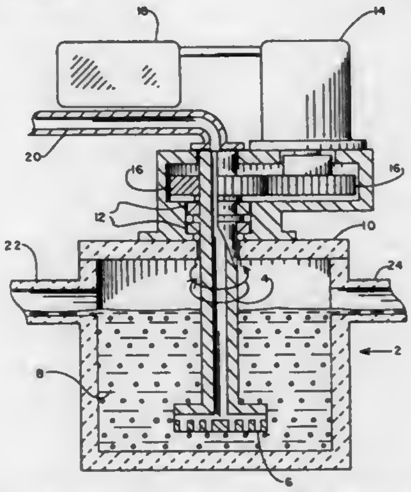
C. Edward Eckert, 260 Lynn Ann Dr., New Kensington, Pa. 15068

Continuation-in-part of Ser. No. 91,608, Jul. 13, 1993, Pat. No. 5,364,450. This application Oct. 4, 1994, Ser. No. 317,539

The portion of the term of this patent subsequent to Nov. 15, 2011, has been disclaimed.

Int. Cl.^{6} C22B *9/05;21/06*

U.S. Cl. 75—678 22 Claims



1. A method for producing increased shear forces in a body containing molten metal by inducing movement of portions of the molten metal in different directions within the body, the movement providing improved dispersion of a media within the body, the method comprising the steps of:
  - (a) providing a body containing molten metal;
  - (b) projecting a mixing means into said body for applying movement to said body; and
  - (c) creating shear forces by:
    - (i) moving portions of said molten metal in one direction by applying said mixing means in one direction; and thereafter
    - (ii) moving portions of said molten metal in another direction by changing the direction of applying said mixing means;
    - (iii) the direction of applying said mixing means being changed periodically to provide said increased shear forces in said body.

5,462,582

SEPARATION AND CONCENTRATION METHOD BASED ON SELECTIVE ABSORPTION

Kaj Holm, Espoo, Finland, assignor to K.H. Innovations Oy, Espoo, Finland

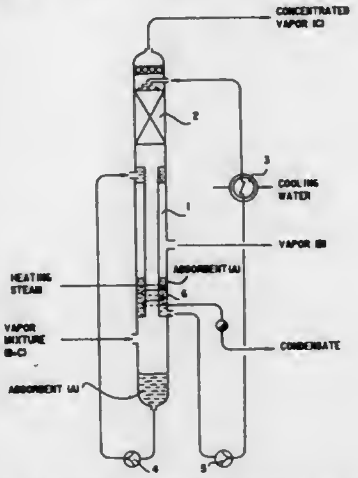
PCT No. PCT/FI92/00277, § 371 Date Jul. 26, 1994, § 102(e) Date Jul. 26, 1994, PCT Pub. No. WO93/07953, PCT Pub. Date Apr. 29, 1993

PCT Filed Oct. 16, 1992, Ser. No. 211,538

Claims priority, application Finland, Jan. 16, 1991, 914890

Int. Cl.^{6} B01D *53/14*

U.S. Cl. 95—175 8 Claims



1. A separation and/or concentration method for minimum boiling point azeotropic mixtures based on selective absorption, said method comprising the steps of:

bringing a vapour-phase mixture into contact with at least one liquid absorbent, said absorbent being at a temperature which is above a condensation temperature of the vapour-phase mixture and said absorbent is capable of absorbing, in an absorption phase, one or more components of the mixture, whereby the mixture becomes concentrated beyond the azeotropic concentration for components not absorbed in essential quantities by the absorbent,

wherein the one or more components absorbed in the absorbent is separated from the absorbent by evaporation at a lower pressure than that employed during the absorption phase in a manner in which a regeneration of the absorbent is essentially performed with the help of a heat of absorption.

5,462,583

ABSORPTION PROCESS WITHOUT EXTERNAL SOLVENT

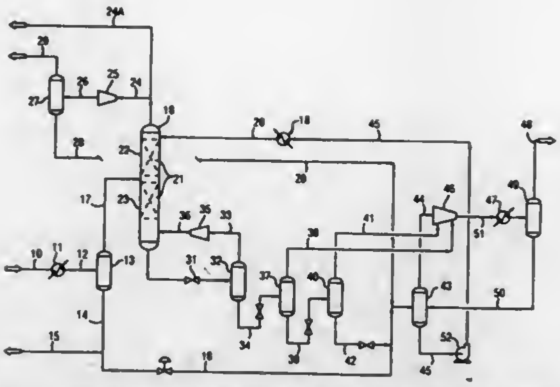
Glenn C. Wood, Houston, and Yuv R. Mehra, The Woodlands, both of Tex., assignors to Advanced Extraction Technologies, Inc., Houston, Tex.

Filed Mar. 4, 1994, Ser. No. 206,420

Int. Cl.^{6} B01D *47/14*

U.S. Cl. 95—192 14 Claims

1. A process for separating a feed gas stream consisting of components which have a spectrum of volatilities including most volatile (light) components, intermediate volatility components, and least volatile (heavy) components, comprising the steps of:



(a) cooling the feed gas stream in a feed gas cooler and separating a heavy component condensate form the feed gas;

(b) conveying a portion of the heavy component condensate produced in step (a) to an absorption zone, said portion of heavy component condensate being a liquid lean solvent;

(c) contacting the feed gas stream with the liquid lean solvent stream in the absorption zone to produce a light product gas stream and a rich solvent liquid stream so that the light product gas stream comprises the light components from the feed gas, and the rich solvent liquid stream comprises the lean solvent plus intermediate and heavy components that have been absorbed by the lean solvent in the absorption zone;

(d) flashing the rich solvent liquid stream form the absorption zone in a flashing zone to produce at lower pressure a flash gas stream and a lean solvent stream so that the flash gas (intermediate product) gas stream comprises the intermediate components form the feed gas, and the lean solvent consists essentially of heavy components supplied from the feed gas; and

(e) conveying the lean solvent produced in step (d) to the absorption zone as the lean solvent stream in step (c).

5,462,584

PROCESS FOR DEHYDRATING NATURAL GAS

Gilbert Gavlin, Lincolnwood, and Boris Coltsin, Skokie, both of Ill., assignors to Gas Research Institute, Chicago, Ill.

Filed May 4, 1994, Ser. No. 237,764

Int. Cl.^{6} B01D *19/00*

U.S. Cl. 95—231 **6 Claims**

5. A process for dehydrating natural gas comprising passing said gas in a continuous counter current zone with a dehydrating solvent composition comprising up to about 15% by weight of water, up to about 6% by weight of an aromatic solubility depressant selected from the group consisting of diphenylmethane and 1,1-diphenylethane, and diethylene glycol containing up to about 33% by weight of a dissolved salt selected from the group consisting of potassium acetate and potassium formate.

5,462,585

METHOD AND APPARATUS FOR SEPARATING GAS FROM A GASEOUS MATERIAL

Toivo Niskanen, Hamina, and Kari Peltonen, Karhula, both of, Finland, assignors to A. Ahlstrom Corporation, Noormarkku, Finland

PCT No. PCT/FI92/00216, § 371 Date Jan. 14, 1994, § 102(e) Date Jan. 14, 1994, PCT Pub. No. WO93/01875, PCT Pub. Date Feb. 4, 1993

PCT Filed Jul. 15, 1992, Ser. No. 182,036

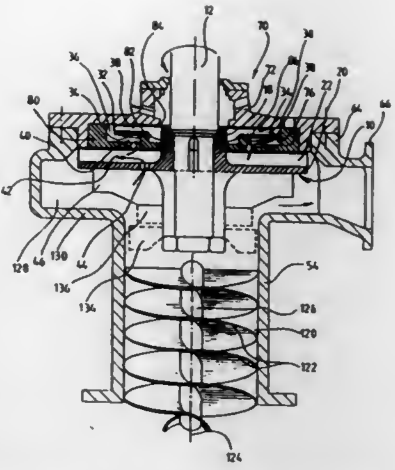
Claims priority, application Finland, Jul. 15, 1991, 913404

Int. Cl.^{6} B01D *19/00*

U.S. Cl. 95—261 **12 Claims**

1. A closed system in which gas is separated from a liquid, or a cellulose fiber suspension, comprising:

a first conduit and a second conduit;



a spiral housing having a central axis, a substantially axial liquid or suspension inlet channel with an inner wall, a liquid or suspension outlet, and a separated gas outlet, said separated gas outlet adjacent said central axis;

a shaft disposed within said spiral housing and connectable to means for rotating said shaft about said central axis;

a flange extending generally perpendicular to said shaft within said spiral housing for rotation about said central axis, at least one opening extending through said flange generally parallel to said axis of rotation;

a plurality of blades mounted to said flange on a face of said flange opposite said liquid suspension inlet;

path defining means comprising one or more overlapping spiral strips mounted to said liquid or suspension inlet channel and spaced from and unconnected to said flange for effecting spiral rotational movement of the liquid or suspension as it moves in said inlet channel toward said spiral housing, defining at least one spiral path, so that the gas starts to separate from the liquid or suspension in the at least one spiral path; and

said liquid or suspension inlet and said liquid or suspension outlet connected to said first and second conduits to provide a closed system.

5,462,586

OIL-AND WATER REPELLENT GAS-PERMEABLE FILTER

Norihide Sugiyama, Yokohama; Masaru Nakamura, Tokyo; Sumihiro Moriyama, and Fumihiro Sasaki, both of Okayama, all of, Japan, assignors to Japan Gore-Tex, Inc., Japan

Filed Sep. 7, 1994, Ser. No. 301,529

Claims priority, application Japan, Sep. 8, 1993, 5-223185; Sep. 20, 1993, 5-233249

Int. Cl.^{6} B01D *71/36;69/12*

U.S. Cl. 96—13 **6 Claims**

1. An oil- and water-repellent gas-permeable filter comprising:

(a) a gas-permeable material having a structure containing passageways therethrough, said material having its internal and external surfaces coated with a compound comprising

(i) a fluoropolymer A having a fluorine-containing aliphatic cyclic structure in the main chain, and

(ii) a fluoropolymer B containing polyfluoroalkyl groups,

wherein the relative concentration of the fluoropolymers is in the range 1 weight part A to 0.01–100 weight parts B.

5,462,587

SILICONE CONTAINING AUTOMOTIVE VINYL PROTECTANT

Suzanne M. Greenleaf, and Martin E. Cifuentes, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Division of Ser. No. 950,517, Sep. 25, 1992, which is a division of Ser. No. 883,976, May 15, 1992, Pat. No. 5,217,758. This application Jun. 6, 1994, Ser. No. 254,853

Int. Cl.^{6} C09K *3/18;* C09G *1/10*

U.S. Cl. 106—2 **1 Claim**

1. A vinyl protectant composition comprising an abrasive free mixture of a film forming polysiloxane; a diluent; and a wax in the form of micronized particles having an average particle size of 3–12 microns; the film forming polysiloxane being a silanol functional phenyl based silicone resin having present in the resin $CH_3SiO_{1.5}$, $(CH_3)_2SiO$, $(CH_3)(C_6H_5)SiO$, and $(C_6H_5)_2SiO$ siloxane units.

5,462,588

FLAME RETARDED ASPHALT COMPOSITION

Robert B. Waiters, and Paul J. Schmidtline, both of Morrison, Colo., assignors to Schuller International, Inc., Denver, Colo.

Filed Apr. 25, 1994, Ser. No. 233,153

Int. Cl.^{6} C08L *95/00;* C09K *21/10*

U.S. Cl. 106—18.21 **6 Claims**

1. A flame retarded asphalt composition comprising:

a. a bituminous composition;

b. a thermoplastic elastomer;

c. an inert filler;

d. from 1 to 20 wt. % of a halogenated flame retardant; and

e. from 0.5 to 10 wt. % of a nitrogen heterocyclic composition having at least six ring members and containing at least three nitrogen atoms.

5,462,589

SYNERGISTIC WOOD PRESERVATIVE COMPOSITIONS

Darrel D. Nicholas, and Tor P. Schultz, both of Starkville, Miss., assignors to Mississippi Forest Products Laboratory, Starkville, Mich.

Filed Feb. 22, 1994, Ser. No. 200,173

Int. Cl.^{6} C08K *3/18;5/02;5/16;* C09D *5/00*

U.S. Cl. 106—18.33 **7 Claims**

1. A biocidal composition for preserving wood having improved efficacy comprising a combination of:

(a) a copper salt; and

(b) an organic biocide selected from the group consisting of tribromophenol, the salts and chelates of tribromophenol, and sodium pyrithione, and the chelates thereof, wherein the combination forms a complex that is substantially non-leachable from wood and wherein the weight ratio of copper to tribromophenol is in the range of about 20:1 to 1:20, and the weight ratio of copper to sodium pyrithione is about 20:1 to 1:2.

5,462,590

INK-JET INK AND METHOD OF PRINTING USING THE SAME

Toshitake Yui; Yoshiro Yamashita; Fuminori Koide; Akihiko Chujo, and Ken Hashimoto, all of Minami-ashigara, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Jan. 18, 1994, Ser. No. 184,195

Claims priority, application Japan, Jan. 25, 1993, 5-027124

The portion of the term of this patent subsequent to Jul. 11, 2012, has been disclaimed.

Int. Cl.^{6} C09D *11/02*

U.S. Cl. 106—20 R **19 Claims**

1. An ink used for an ink-jet printer which forms droplets by the effect of thermal energy to make printing, wherein said ink comprises at least water, a coloring material and an amine compound represented by the following formula(I):

$$R_1R_2R_3N \qquad (I)$$

wherein one or two of R_1, R_2 and R_3 represent(s) (an) alkyl group(s) having 1 to 5 carbon atoms substituted by at least one group selected from the group consisting of a carboxy group, a sulfonic acid group, and a Li, Na, K or ammonium salt thereof, and the remainder represent(s) (an) hydrogen atom(s), or (an) alkyl group(s) having 1 to 5 carbon atoms substituted by a hydroxide group or a carbamoyl group, provided that two of R_1, R_2 and R_3 may be the same substituent groups, wherein pH of said ink is between 6 and 8.

5,462,591

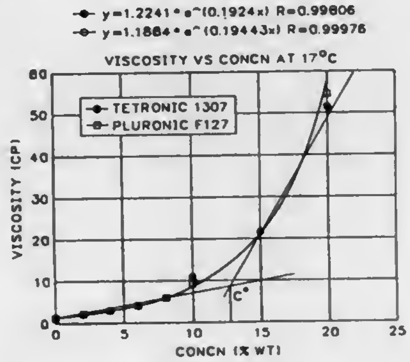
HYPERTHERMOGELLING AQUEOUS PHASE CHANGE INKS AND METHODS FOR USING THEM IN AN INK JET PRINTER

B. M. Karandikar, Lake Oswego; Loc V. Bui, Portland, and Hue P. Le, Beaverton, all of Oreg., assignors to Tektronix, Inc., Wilsonville, Oreg.

Filed May 6, 1994, Ser. No. 239,105

Int. Cl.^{6} C09D *11/02*

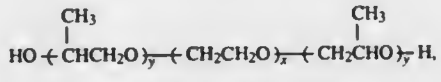
U.S. Cl. 106—20 R **36 Claims**



1. An aqueous phase change ink composition, comprising:

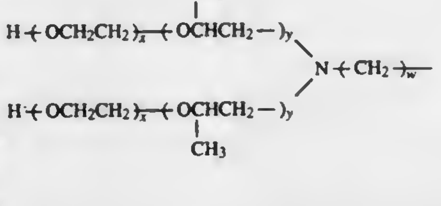
a coloring agent; and

an amount of hyperthermogelling component in a concentration such that the ink composition is in a liquid state at a first temperature and is in a solid state at a second temperature where the second temperature is greater than the first temperature, the hyperthermogelling component comprising a formula selected from the group consisting of:



$$HO\!\leftarrow\!\underset{\displaystyle CH_3}{\overset{\displaystyle CH_3}{\overset{|}{C}}}\!HCH_2O)_y\!-\!(CH_2CH_2O)_x\!-\!(CH_2\overset{\displaystyle CH_3}{\overset{|}{C}}HO)_y\!-\!H,$$

and contains about 10% to about 80% poly(oxyethylene) and about 20% to about 60% poly(oxypropylene) where x and y are any integers that satisfy the weight percent and molecular weight ranges and the hyperthermogelling component has a molecular weight range of about 1,000 to about 50,000;



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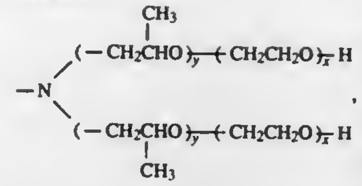
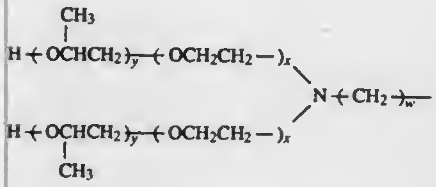
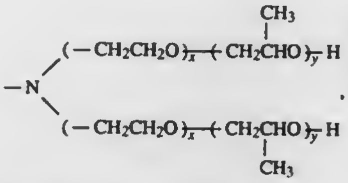


and contains about 10% to about 80% poly(oxyethylene) and about 20% to about 60% poly(oxypropylene) where w is an integer from 2 to 6 and x and y are any integers that satisfy the weight percent and molecular weight ranges and the hyperthermogelling component has a molecular weight range of about 1,000 to about 50,000; and





and contains about 10% to about 80% poly(oxyethylene) and about 20% to about 60% poly(oxypropylene) where w is an integer from 2 to 6 and x and y are any integers that satisfy the weight percent and molecular weight ranges and the hyperthermogelling component has a molecular weight range of about 1,000 to about 50,000.

5,462,592

AQUEOUS INK COMPOSITION

Kakuji Murakami, Kawasaki, and Kiyofumi Nagai, Tokyo, both of, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Jun. 7, 1993, Ser. No. 72,734

Claims priority, application Japan, Jun. 9, 1992, 4-149375; Jul. 14, 1992, 4-186927

Int. Cl.^{6} C09D *11/02*

U.S. Cl. 106—22 R **10 Claims**

1. An aqueous ink composition comprising:

a water-soluble dye comprising an anionic dye component and a cationic dye counter ion;

water; and

an anionic surface active agent comprising an anionic component and a cationic counter ion which is selected from the group consisting of a lithium cation, a quaternary ammonium cation and a quaternary phosphonium cation, with the amount of said anionic surface active agent being in the range of 0.2 to 10 wt. % of the total weight of said aqueous ink composition.

5,462,593

METHOD OF PRODUCING PROTEIN PRODUCTS FOR BRIGHT PAPER COATING APPLICATIONS

George Poppe; Denise Ciesielski, both of Decatur, and Mark Matlock, Mt. Zion, all of Ill., assignors to Archer Daniels Midland Company, Decatur, Ill.

Continuation-in-part of Ser. No. 986,590, Dec. 7, 1992, Pat. No. 5,364,465. This application Jun. 7, 1994, Ser. No. 254,950

The portion of the term of this patent subsequent to Nov. 15, 2011, has been disclaimed.

Int. Cl.^{6} C08L *89/00*

U.S. Cl. 106—124 **31 Claims**

1. A method of producing a modified vegetable protein binder for paper coatings comprising providing a non-hydrolyzed and non-carboxylated vegetable protein material extract; bleaching the vegetable protein extract with an oxidizing agent and a magnesium compound to provide a bleached vegetable protein material and chemically modifying the bleached vegetable protein material by hydrolyzation and drying.

5,462,594

COATING DEVICE FOR COATING OF A SIZE-PRESS ROLL, PAPER OR BOARD

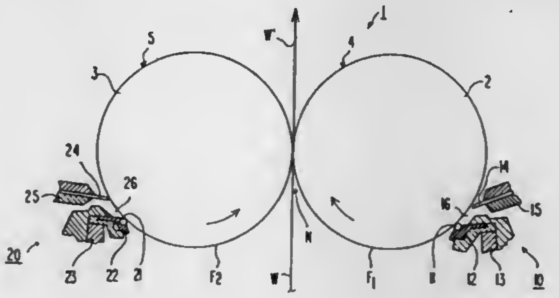
Rauno Rantanen, Muurame, Finland, assignor to Valmet Paper Machinery Inc., Helsinki, Finland

Continuation-in-part of Ser. No. 686,026, Apr. 16, 1991, Pat. No. 5,246,497. This application May 20, 1993, Ser. No. 65,569

Claims priority, application Finland, Apr. 19, 1990, 901967

Int. Cl.^{6} B05C *1/08*

U.S. Cl. 118—249 **20 Claims**



1. A device in a size press for coating a paper web or board comprising

a pair of rolls defining a nip through which a paper or board web is passed,

a pair of coating machines each having a width and being provided with a moving base comprising one of said pair of rolls, each of said machines comprising

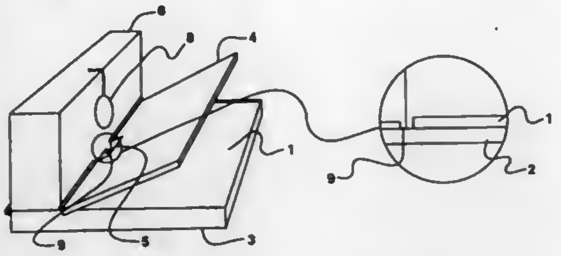
means defining a substantially closed and pressurized coating agent chamber through which a coating agent is fed under pressure and applied onto said moving base, said means comprising a revolving coating bar resting against said moving base, said coating bar extending across said machine width and comprising a large diameter smooth-faced coating bar having a diameter from about 25 mm to about 80 mm, said coating chamber being arranged before said coating bar in a running direction of said moving base such that said coating bar spreads and smoothes the coating agent applied onto said moving base, and

a cradle supporting said coating bar substantially over its entire length, and

said device further comprising regulating means for regulating the profile of coating quantity on the web, said regulating means comprising at least a first one of said pair of rolls being a variable-crown roll wherein a linear contact face defined between said coating bar and said variable-crown roll is adjusted to be straight via loading means.

5,462,595
INK PAD WITH REFILLABLE INK RESERVOIR

Jong P. Im, 4 E. Laburnum Ave., Richmond, Va. 23222
Filed Dec. 14, 1994, Ser. No. 355,960
Int. Cl.^{6} B05C *21/00*
U.S. Cl. 118—264 **1 Claim**

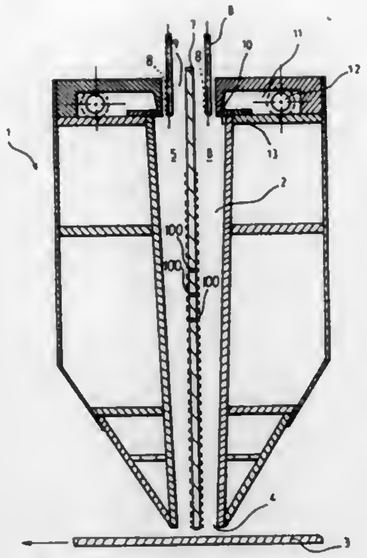


1. An ink pad device comprising:
- a) an ink reservoir, said reservoir including a rectangular box, wherein a refilling hole is located centrally at a front surface of said box;
- b) an ink dispenser, said dispenser including a round tube, wherein said dispenser is oriented vertically, wherein a top end of said dispenser is attached centrally to a lower front edge of said reservoir;
- c) a cap, wherein said cap is attached to said reservoir by a chord;
- d) a housing including a bottom surface and four side walls, wherein said reservoir is pivotally connected along its lower front edge to a top edge of a rear side wall of said housing;
- e) a first ink pad including a rectangular, porous material, said first ink pad being on the bottom surface of said housing, wherein a bottom end of said dispenser is in contact with said first ink pad;
- f) a second ink pad including a rectangular, porous material having an absorption capacity which is lower than that of said first ink pad, wherein said second ink pad is placed on top of said first ink pad, wherein a top surface of said second ink pad aligns with top edges of said side walls of said housing; and
- g) an ink pad cover including a rectangular panel having an opening for receiving said dispenser, wherein said cover is pivotally connected along a rear bottom edge to said housing and said rear bottom edge of said cover meets with said lower front edge of said reservoir.

5,462,596
APPARATUS FOR THE DISTRIBUTION OF PULVERULENT SOLIDS ONTO THE SURFACE OF A SUBSTRATE IN ORDER TO COAT IT

Alain Arnaud, Versailles, and Claude Morin, Puteaux, both of, France, assignors to Saint-Gobain Vitrage International, Courbevoie, France
Filed Feb. 22, 1994, Ser. No. 199,633
Claims priority, application France, Feb. 25, 1993, 93 02136
Int. Cl.^{6} B05B *7/14;* **C03C** *17/00;* **B05D** *1/36*
U.S. Cl. 118—310 **17 Claims**

1. Apparatus for the distribution of pulverulent solids suspended in a gas onto a moving substrate formed by a ribbon of glass to deposit layers on the ribbon of glass by solid pyrolysis, said apparatus comprising:
- two walls defining an elongate cavity extending substantially transversely to a movement direction of the substrate, said cavity terminating in a distribution slot adjacent the substrate;
- at least one partition in said cavity and positioned so as to divide said cavity into two compartments spaced in the movement direction of the substrate;
- pulverulent solid injection means for injecting a pulverulent solid into each of said compartments; and
- pressurized gas injection means for injecting a pressurized gas into each of said compartments.



5,462,597
SYSTEM FOR INKLESS FINGERPRINTING

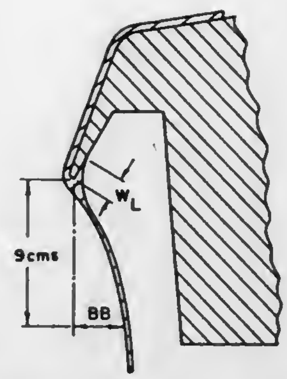
Nusrallah Jubran, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing, Saint Paul, Minn.
Filed Jun. 30, 1994, Ser. No. 268,625
Int. Cl.^{6} B41K *1/36*
U.S. Cl. 118—31.5 **16 Claims**

1. A fingerprinting system comprising means capable of releasably retaining a liquid and a liquid composition releasably retained in said means, said liquid composition consisting essentially of: (i) a leuco color-former compound and a solvent selected from the group consisting of: a dialkyl phthalate wherein the alkyl group contains 1–3 carbon atoms; said dialkyl phthalate and an alkyl benzoate wherein the alkyl group of said alkyl benzoate contains 10 to 18 carbon atoms; and said dialkyl phthalate and an alkyl ester of a fatty acid wherein the fatty acid group contains 10 to 18 carbon atoms; and (ii) a substrate for receiving fingerprints associated therewith, said substrate being coated on at least a portion of one surface thereof with a color developing substance consisting essentially of: a phenol/aldehyde condensation product produced by the reaction of an alkyl-substituted salicylic acid, an alkyl-substituted phenol, and an aldehyde, said condensation product having been reacted with a metal source.

5,462,598
CURTAIN COATING DEVICE

Jeanne D. Servant, and Jean-Marie Baumlin, both of Chalon-sur-Saone, France, assignors to Eastman Kodak Company, Rochester, N.Y.
PCT No. PCT/EP92/02801, § 371 Date Jul. 28, 1993, § 102(e) Date Jul. 28, 1993, PCT Pub. No. WO93/11879, PCT Pub. Date Jun. 24, 1993
PCT Filed Dec. 3, 1992, Ser. No. 94,102
Claims priority, application France, Dec. 10, 1991, 91 15562
Int. Cl.^{6} B05C *5/00*
U.S. Cl. 118—324 **15 Claims**

1. A curtain coating system wherein a coating composition is deposited on a moving support in the form of at least one layer having in combination:
- a) a coating device comprising a feeding device (2,3) for supplying said coating composition to be deposited on a moving support, a flow surface (4) over which the coating composition flows by gravity at an outlet from said feeding device and a lip (5) from which the composition leaves the flow surface of the coating device along a front surface (10) thereof, said front surface having a bottom end and being either substantially vertical or positively sloped, said lip further comprising:



a) a positively sloped rear surface (11) having a bottom end and defining with said front surface (10) an angle θ of less than 90°; and
b) a chamfer (12) between the bottom ends of said front and rear surfaces (10, 11) having a width, wherein a ratio between a thickness of the coating composition at the front surface (10) of the lip and the width of the chamfer (12) is at least one; and
b) a moving support below and spaced from the lip such that the coating composition, upon leaving the lip, forms a free falling vertical curtain that impinges on one face of said moving support forming thereon a layer of said coating composition.

5,462,599
METHOD AND APPARATUS FOR COATING BOARD-SHAPED ARTICLES, ESPECIALLY PRINTED CIRCUIT BOARDS

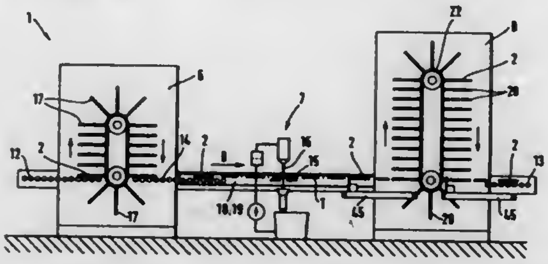
Kaspar Kuster, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Aug. 19, 1993, Ser. No. 109,282

Claims priority, application Switzerland, Aug. 24, 1992, 2636/92

Int. Cl.⁶ B05C *5/00;13/02*

U.S. Cl. 118—503 **16 Claims**



1. An apparatus which comprises: a transport and coating apparatus for printed circuit boards, which includes
a preheating station for the printed circuit boards which is arranged at an entrance to the apparatus, and following the preheating station, in the sequence of their arrangement, at least one coating station for coating at least one side of the printed circuit boards with a protective layer, and at least one vapour-removal and drying station, each of which processing stations has an associated individual transport means for the printed circuit boards,
wherein the transport means in the vapour-removal and drying station comprise carrying elements for longitudinal edges of the printed circuit boards, which carrying elements are fixed to the vapour-removal and drying station and are adjustable to a width which corresponds to a width of the printed circuit boards may be carried and which support and guide the printed circuit boards at the longitudinal edges over their entire length,
wherein each carrying element comprises two carrying arms which extend approximately parallel to the longitudinal edges of the boards, at least one of the carrying arms being displaceable transversely to the longitudinal extent of the carrying arms.
wherein each carrying element is secured to two endless circulating roller chains which are arranged opposite one another, each link of the chains being provided with drilled holes for receiving guide rods of approximately circular cross-section along which the carrying arms are displaceable transversely to their longitudinal extent.

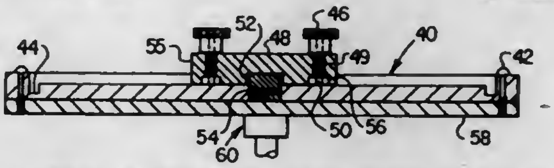
5,462,600
APPARATUS FOR FILM COATED PASSIVATION OF INK CHANNELS IN INK JET PRINTHEAD

John R. Pies, Dallas, Tex., assignor to Compaq Computer Corporation, Houston, Tex.

Division of Ser. No. 947,830, Sep. 21, 1992, Pat. No. 5,334,415. This application Apr. 7, 1994, Ser. No. 225,183

Int. Cl.⁶ B05C *11/00*

U.S. Cl. 118—503 **6 Claims**



1. Apparatus for coating closely spaced straight, parallel channels in an upper portion of a workpiece having a lower portion with a periphery, comprising:
a rotation plate having a centrum, top and bottom side surfaces, and a peripheral edge;
spinning means for spinning said rotation plate planarly about said centrum;
a recess formed in said rotation plate and extending downwardly through said top side surface radially outwardly of said centrum,
said recess having a peripheral side portion and being configured to downwardly and removably receive the lower workpiece portion with said peripheral side portion of said recess extending completely and contiguously around the lower workpiece portion periphery, with the upper workpiece portion extending upwardly beyond said top rotation plate side surface and the lengths of the workpiece channels extending generally radially relative to said rotation plate, to thereby prevent appreciable radial and circumferential movement of the received workpiece relative to said rotation plate; and
clamping means removably connectable to said top side surface of said rotation plate in an overlying relationship with the upper portion of the received workpiece and operable to exert a downwardly directed clamping force on the received workpiece to releasably prevent its upward removal from said recess,
whereby, with the workpiece received and clamped within said recess, and a coating material positioned in radially inner portions of the workpiece channels, said spinning means may be operated to cause the coating material to be forced radially outwardly along and coat the workpiece channels.

5,462,601
AUTOMATED TEST PANEL SPRAY/BAKE DEVICE

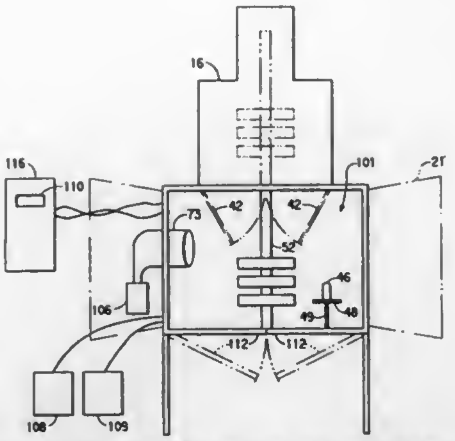
Allan F. Falcoff, Chadds Ford, Pa.; James A. Delano, Grand Blanc, Mich.; Robert E. Albers, Wilmington, and Robert C. Jankowski, Newark, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 7, 1993, Ser. No. 88,968

Int. Cl.⁶ B05B *12/02*

U.S. Cl. 118—697 **11 Claims**

1. A spray booth enclosing a spraying zone and a separate baking zone having entry means for introducing a panel into said booth and means for vertically positioning said panel in said booth,



a spray gun mounted in said spraying zone and infrared heating elements mounted in said separate baking zone, wherein said baking zone is atmospherically isolated from said spraying zone when said heating elements are activated;

means for moving said spray gun relative to said panel to apply at least one programmed spray coating to said panel,

means for advancing a coated panel directly from said spraying zone into said baking zone,

said spray gun and said heating elements being programmed to automatically perform spraying and baking cycles, wherein, prior to activating said heating elements, said baking zone has an air pressure which is greater than the air pressure of said spraying zone; and

computer means for controlling coating flow to said gun and for actuating monitoring and correcting parameters of movement and coating flow to said gun and movement of said panel within said spray booth.

5,462,602

APPARATUS FOR CONTINUOUS REACTIVE METAL DEPOSITION IN VACUUM WITH WEB LOOPING OVER UPPER AND LOWER ROLLERS

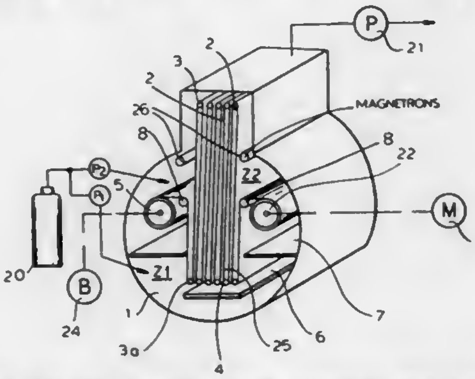
Carlo Misiano, and Enrico Simonetti, both of Rome, Italy, assignors to CE.TE.V. Centro Technologie Del Vuoto, Carsoli, Italy

Filed Jun. 10, 1994, Ser. No. 258,978

Claims priority, application Italy, Jun. 11, 1993, RM93A0385

Int. Cl.^{6} C23C *16/54*

U.S. Cl. 118—718 **8 Claims**



5. An apparatus for reactive metal deposition upon a web of a plastic film, comprising:

means for forming a vacuum chamber containing a reactive atmosphere;

a plurality of spaced apart rollers in said chamber defining a path for said web through said chamber including at least one loop;

a supply roll for feeding said web to said path;

a takeup roll for receiving said web from said path; and

at least one source of metal vapor juxtaposed with only a portion of said path for depositing a coating of said metal on said web, said coating reacting in said reactive atmosphere over another portion of said path, said rollers including an upper array of rollers and a lower array of rollers, said web being looped between upper and lower rollers of said arrays, some of the rollers of one of said arrays being lower than other rollers of said one of said arrays and being larger than rollers of the other of said arrays such that curvature of said web as said web passes around the rollers of said one of said arrays is minimized.

5,462,603

SEMICONDUCTOR PROCESSING APPARATUS

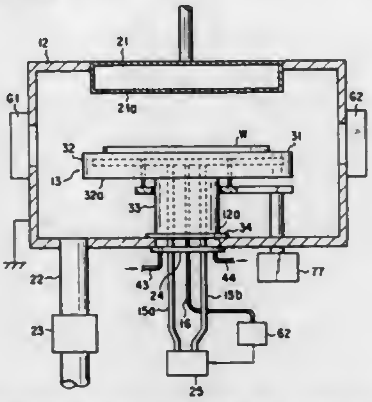
Seishi Murakami, Koufu, Japan, assignor to Tokyo Electron Limited, Tokyo, Japan

Filed Jun. 24, 1994, Ser. No. 265,139

Claims priority, application Japan, Jun. 24, 1993, 5-179845

Int. Cl.^{6} C23C *16/00*

U.S. Cl. 118—719 **13 Claims**



1. A semiconductor processing apparatus comprising:

a process chamber for defining a process space storing a substrate to be processed in an airtight state, said chamber including a gate for opening/closing a passage for passing said substrate;

means for supplying a process gas to said process space of said chamber;

means for exhausting said process space of said chamber;

a case arranged in said process space of said chamber to cover an opening formed in a wall of said chamber, said case being entirely made of substantially the same light transmissive material, said case comprising a container portion having top and bottom plates, and a duct portion substantially smaller than said container portion and connecting said container portion to said opening, said top plate having a flat outer surface with a larger contour than a contour of said substrate, on which said substrate is mounted, said bottom plate being located separate from a bottom wall of said chamber;

a resistance heating body arranged in said container portion;

a reflecting plate arranged between said resistance heating body and said bottom plate in said container portion, for reflecting radiation heat generated by said resistance heating body to said top plate;

a feeder for applying an electric power to said resistance heating body;

a temperature measuring member introduced in said container portion for measuring the temperature of said resistance heating body;

means for supplying an inactive gas to said inner space of said case;

means for exhausting said inactive gas from said inner space of said case to the outside of said chamber;

a cover closing said opening of said chamber to close said case, said feeder, temperature measuring member, and means for supplying and exhausting said inactive gas being arranged to pass through said cover and in said duct portion between the outside of said chamber and said inner space of said case without passing said process space;

a plurality of lift pins for moving up and down said substrate, said lift pins being respectively inserted in through-holes vertically passing through said inner space of said case, said through-holes being respectively defined by tubes made of said light transmissive material and connected to said top and bottom plates such that said through-holes are airtightly isolated from said inner space of said case;

a support arranged between said bottom plate of said case and said bottom wall of said chamber, and supporting said lift pins; and

driving means for vertically moving said support between said bottom plate of said case and said bottom wall of said chamber.

5,462,604
METHOD OF OSCILLATING ULTRASONIC VIBRATOR FOR ULTRASONIC CLEANING

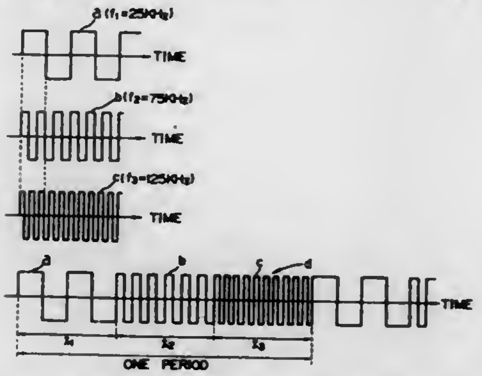
Yoshihide Shibano, 1629-1-12, Oyama-cho, Machida-shi, Tokyo, and Tsutou Saito, 8-12, Aza Yakumojinja, Ooaza Sekiwaku, Izumisaki-mura, Nishishirakawa-gun, Fukushima-ken, both of, Japan

Filed Feb. 22, 1994, Ser. No. 199,646

Claims priority, application Japan, Feb. 22, 1993, 5-032140

Int. Cl.^{6} B08B *3/12*

U.S. Cl. 134—1 **10 Claims**



1. A method of oscillating an ultrasonic vibrator for radiating ultrasonic energy into a cleaning solution, comprising the steps of:

(a) providing an ultrasonic vibrator mounted on an ultrasonic cleaning tank, said ultrasonic vibrator having a single natural frequency;

(b) generating a plurality of oscillating signals having respective different frequencies which are integral multiples of said single natural frequency of the ultrasonic vibrator;

(c) switching between and outputting said oscillating signals for respective periods of time thereby to generate a composite signal which is composed of a time series of said oscillating signals; and

(d) applying said composite signal as a drive signal to oscillate the ultrasonic vibrator for radiating ultrasonic energy into the cleaning solution in said cleaning tank.

5,462,605
APPARATUS AND METHOD FOR TREATING SENSITIVE SURFACE, IN PARTICULAR OF SCULPTURE

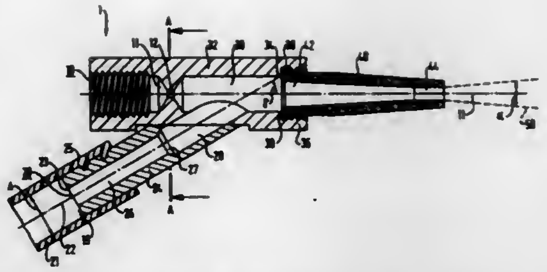
Johann Szücs, Connollystrasse 31, 80809 München, Germany

Filed Jul. 27, 1993, Ser. No. 98,453

Claims priority, application Germany, Aug. 3, 1992, 42 25 590.2

Int. Cl.^{6} B08B *3/02*

U.S. Cl. 134—7 **28 Claims**



24. Method for treating, for example cleaning, sensitive highly contoured surfaces such as those of sculptures of wood, paster, and bronze, using an apparatus comprising a mixing head for mixing media supplied to the mixing head and for spraying a treatment jet formed therefrom, a first jet containing a liquid treatment agent being introduced under pressure into a mixing chamber of the mixing head via a first supply conduit through an inlet and via a second supply conduit a second jet is introduced, the jet axis of which is inclined at an angle (γ) to the jet axis of the first jet and extends eccentrically thereto, and the inlet having an inlet opening which is slit-like and oriented so that the first jet is relatively wide so as to substantially overlap the cross-sectional area of the second jet in an intersection region of the first and the second jets, and said method being carried out by means of the treatment jet.

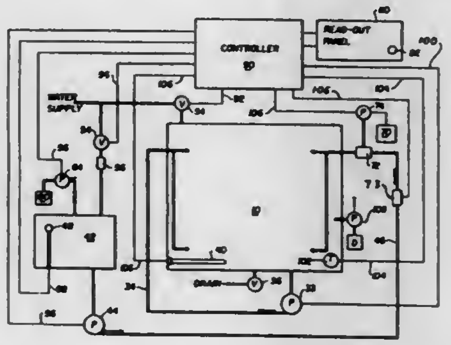
5,462,606
CHEMICAL SANITIZING OF FOODWARE

John R. Burns, 3003 Venture Ct., Export, Pa. 15632

Filed Apr. 22, 1994, Ser. No. 231,643

Int. Cl.^{6} B08B *13/00*

U.S. Cl. 134—18 **16 Claims**



11. A method for washing and sanitizing dishes or other articles comprising:

a) placing articles to be washed into the cleansing chamber of a dishwashing machine;

b) spraying cleansing liquid over the soiled articles;

c) draining the cleansing liquid;

d) rinsing the dishes with hot rinsing water;

e) sensing the temperature of the rinsing water;

f) Injecting sanitizer into the rinsing water in a predetermined amount when said temperature of said hot rinsing water is sensed to be below a predetermined threshold minimum.

5,462,607
METHOD OF CLEANING USING A FOAMED LIQUID

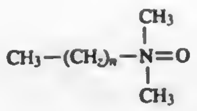
Pat A. Mestetsky, St. Charles, and Robert E. Davis, Hinsdale, both of Ill., assignors to United Laboratories, Inc., St. Charles, Ill.

Filed Apr. 15, 1994, Ser. No. 228,575

Int. Cl.^{6} B08B *3/10;9/00;9/02;9/08*

U.S. Cl. 134—22.12 **6 Claims**

1. A method of removing hydrocarbons and coke deposits for industrial processing equipment, comprising the steps of preparing an aqueous cleaning solution containing from 30 to 2500 ppm of a non-ionic surfactant having the following formula:



$$CH_3-(CH_2)_n-\overset{\overset{\displaystyle CH_3}{|}}{\underset{\underset{\displaystyle CH_3}{|}}{N}}=O$$

where n is 6 to 20, and 1 to 200 ppm of an enzyme selected from the group consisting of proteases, amylases lipases, cellulases, pectinases, and mixtures thereof, introducing said solution into a vessel having hydrocarbons and coke deposits on walls thereof to partially fill the vessel and provide a headspace in the vessel above a level of said solution, heating the solution in the vessel to an elevated temperature sufficient to ebullate the solution and generate a quantity of foam in said headspace, said foam carrying said surfactant and said enzymes; circulating the heated solution through the vessel to remove the hydrocarbons and coke deposits from the vessel walls, and flowing the foam from the headspace of the vessel into contact with a contaminated surface outside of the vessel to remove hydrocarbons and coke deposits from said surface.

5,462,608

PELTIER EFFECT DEVICE TO DETECT IN PARTICULAR A CONDENSATION RISK ON A SURFACE BEING IN CONTACT WITH A WET AIR VOLUME

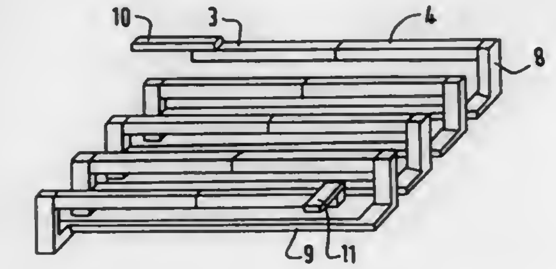
Michel Gschwind, Grasse, and Pascal Ancey, Le Rouret, both of, France, assignors to Imra Europe SA, Valbonne, France

Filed Apr. 4, 1994, Ser. No. 222,267

Claims priority, application France, Apr. 6, 1993, 93 04058

Int. Cl.^{6} H01L *35/10;35/32*

U.S. Cl. 136—203 **8 Claims**



1. A Peltier effect device for detecting in particular a condensation risk on a surface in contact with a wet air volume, comprising:

a substrate on which semiconducting bands of N-type and P-type are formed, each of said bands extending between a peripheral and a central zone of the upper face of the substrate, said bands being connected by junctions of N-P type and P-N type in order to make up a series circuit formed alternately of the N-type semiconducting bands and the P-type semiconducting bands, junctions of only one type being situated on the central zone of the upper face of the substrate and forming a detection zone of the device,

wherein the N-type semiconducting bands are placed on one side of the upper face of the substrate and the P-type semiconducting bands (4) are placed on the other side of the upper face of the substrate and

wherein the substrate has at the peripheral zone of each band except for a frontmost N-type band and a rearmost P-type band, a plated hole extending through the substrate to a lower face of the substrate and to a plating of the lower face such that a plated hole situated at an end of the P-type band is connected to a plated hole situated at an end of a next N-type band (3).

5,462,609

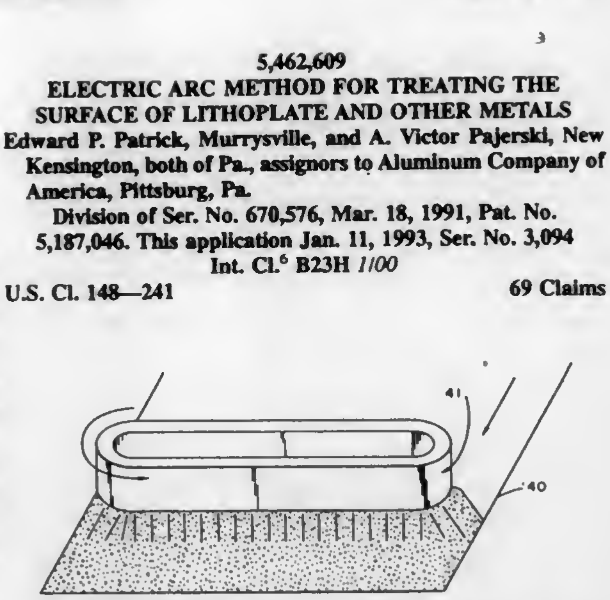
ELECTRIC ARC METHOD FOR TREATING THE SURFACE OF LITHOPLATE AND OTHER METALS

Edward P. Patrick, Murrysville, and A. Victor Pajerski, New Kensington, both of Pa., assignors to Aluminum Company of America, Pittsburg, Pa.

Division of Ser. No. 670,576, Mar. 18, 1991, Pat. No. 5,187,046. This application Jan. 11, 1993, Ser. No. 3,094

Int. Cl.^{6} B23H *1/00*

U.S. Cl. 148—241 **69 Claims**



1. A method of increasing the surface area of a metal surface, said method comprising;

conducting an electric arc between the leading edge of an electrode and said metal surface, said leading edge being the surface of said electrode adjacent said metal surface;

moving said arc around a substantially closed loop path generally defined by leading edge of said electrode; and

effecting relative movement between said arc and said metal surface in such a manner to contact an extensive area of said surface.

5,462,610

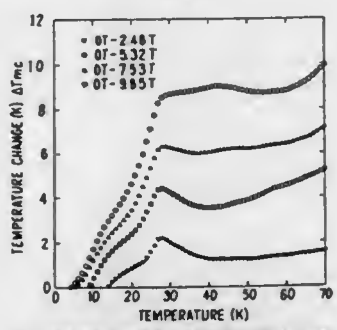
LANTHANIDE AL-NI BASE ERICSSON CYCLE MAGNETIC REFRIGERANTS

Karl A. Gschneidner, Jr., Ames, Iowa, and Hiroyuki Takeya, Ibaraki, Japan, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Jul. 8, 1993, Ser. No. 88,881

Int. Cl.^{6} C22C *28/00*

U.S. Cl. 148—301 **13 Claims**



THE CALCULATED MAGNETOCALORIC EFFECT FOR FOUR DIFFERENT MAGNETIC FIELD CHANGES AS A FUNCTION OF TEMPERATURE FOR DyAlNi - SAMPLE B.

1. An Ericsson cycle magnetic refrigerant for a magnetic refrigerator using the Ericsson thermodynamic cycle comprising RAlNi wherein R is selected from the group consisting of Gd, Tb, Dy, Ho, and Er and wherein said RAlNi is a substantially single phase having less than about 10 volume % second phase therein and a generally constant magnetocaloric effect above a magnetic ordering temperature.

3. An Ericsson cycle magnetic refrigerate for a magnetic refrigerator using the Ericsson thermodynamic cycle comprising $(R_{1-x}R'_x)AlNi$ wherein R and R' are different lanthanide elements selected from the group consisting of Gd, Tb, Dy, Ho, and Er and where x is greater than 0 and less than 1 and wherein said $(R_{1-x}R'_x)AlNi$ is a substantially single phase having less than about

10 volume % second phase therein and a generally constant magnetocaloric effect above a magnetic ordering temperature.

5,462,611
FERRITIC STAINLESS STEEL EXCELLENT IN HIGH TEMPERATURE OXIDATION RESISTANCE AND SCALE ADHESION

Yoshihiro Uematsu, Kudamatsu; Naoto Hiramatsu, and Manabu Oku, both of Tokuyama, all of, Japan, assignors to Nisshin Steel Co., Ltd., Tokyo, Japan

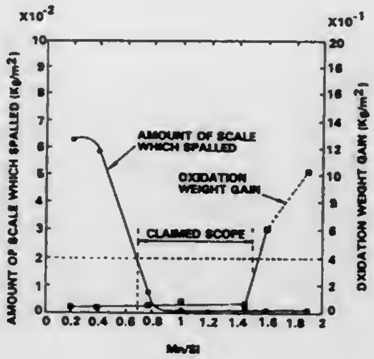
PCT No. PCT/JP94/00693, § 371 Date Dec. 22, 1994, § 102(e) Date Dec. 22, 1994, PCT Pub. No. WO94/25636, PCT Pub. Date Nov. 10, 1994

PCT Filed Apr. 26, 1994, Ser. No. 356,248

Claims priority, application Japan, Apr. 27, 1993, 5-122112; Apr. 27, 1993, 5-122162

Int. Cl.^{6} C22C *38/20*

U.S. Cl. 148—325 6 Claims



1. A ferritic stainless steel excellent in high temperature oxidation resistance and scale adhesion which consists essentially of in mass %,

C: up to 0.03%,
Si: from 0.80% to 1.20%,
Mn: from 0.60% to 1.50%,
Cr: from 11.0% to 15.5%,
Nb: from 0.20% to 0.80%,
Ti: up to 0.1% (inclusive of non-addition),
Cu: not less than 0.02% and less than 0.30%,
N: up to 0.03%,
Al: up to 0.05% (inclusive of non-addition),
O: up to 0.012%,

the balance being Fe and unavoidable impurities, and wherein the alloying elements are adjusted so that the following relations (1), (2), and (3):

$$0.7 \leqq \text{Mn/Si} \leqq 1.5, \tag{1}$$

$$1.4 \leqq \text{Nb} + 1.2\text{Si} \leqq 2.0 \text{ and} \tag{2}$$

$$1221.6(\text{C}+\text{N}) - 55.1\text{Si} + 65{,}7\text{Mn} - 8.7\text{Cr} - 99.5\text{Ti} - 40.4\text{Nb} + 1.1\text{Cu} + 54 \leqq 0 \tag{3}$$

are concurrently satisfied, and wherein said steel exhibits an oxidation weight gain of not more than 0.02 kg/m^2 and an amount of scale which has spalled of not more than 0.01 kg/m^2 after subjected to a continuous heating in atmospheric air at a temperature of 900° C. for a period of 100 hours and said steel exhibits an oxidation weight gain of not more than 0.4 kg/m^2 and an amount of scale which has spalled of not more than 0.02 kg/m^2 after subjected to a continuous heating in atmospheric air at a temperature of 1000° C. for a period of 100 hours.

5,462,612
AIRTIGHT ALUMINUM ALLOY CASTING AND ITS MANUFACTURING METHOD

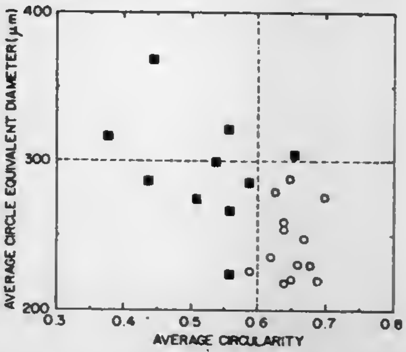
Shigetaka Morita; Yoshio Igarashi, both of Minamikawachi, and Masanao Suzuki, Kanda, all of, Japan, assignors to Hitachi Metals, Ltd., Tokyo, Japan

Filed Mar. 25, 1994, Ser. No. 217,700

Claims priority, application Japan, Mar. 26, 1993, 5-067806

Int. Cl.^{6} C22C *21/02*; C22B *21/00*

U.S. Cl. 148—439 7 Claims



1. An airtight aluminum alloy casting comprising 4.0 to 13.0% of Si, 4.5% or less of cu, 1.5% or less of Mg, and the rest of Al in weight ratio, wherein the aluminum alloy casting further comprises 0.3 to 0.9 ppm of hydrogen and at least one of 0.03 to 0.20 wt. % of Ti and 10 to 100 ppm of B, a wall thickness of 1 to 6 mm at thin portions of the aluminum alloy casting, and pores in the aluminum alloy casting having an average circularity of 0.6 or more and average circle equivalent diameter of 300 μm or less.

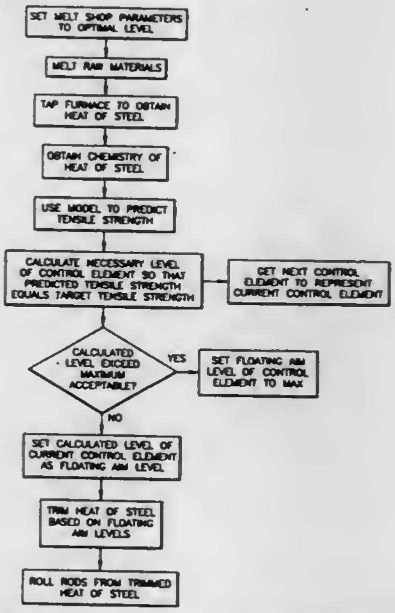
5,462,613
METHOD AND APPARATUS FOR PRODUCING STEEL RODS WITH A DESIRED TENSILE STRENGTH AND MODEL FOR SIMULATING SAME

Robert J. Glodowski, and Allyen E. Wilson, III, both of Kansas City, Mo., assignors to GS Technologies Corporation, Kansas City, Mo.

Filed Jun. 7, 1994, Ser. No. 254,969

Int. Cl.^{6} C21D *9/573*

U.S. Cl. 148—500 21 Claims


SET MELT SHOP PARAMETERS TO OPTIMAL LEVEL
MELT RAW MATERIALS
TAP FURNACE TO OBTAIN HEAT OF STEEL
OBTAIN CHEMISTRY OF HEAT OF STEEL
USE MODEL TO PREDICT TENSILE STRENGTH
CALCULATE NECESSARY LEVEL OF CONTROL ELEMENT SO THAT PREDICTED TENSILE STRENGTH EQUALS TARGET TENSILE STRENGTH
GET NEXT CONTROL ELEMENT TO REPRESENT CURRENT CONTROL ELEMENT
CALCULATED LEVEL EXCEED MAXIMUM ACCEPTABLE?
YES
SET FLOATING AIM LEVEL OF CONTROL ELEMENT TO MAX
NO
SET CALCULATED LEVEL OF CURRENT CONTROL ELEMENT AS FLOATING AIM LEVEL
TRIM HEAT OF STEEL BASED ON FLOATING AIM LEVELS
ROLL RODS FROM TRIMMED HEAT OF STEEL

1. A method for producing a rod, within a rod manufacturing process, having a predetermined target value for at least one critical mechanical property based on an empirical model of said

rod manufacturing process which predicts a value for said critical property based upon a chemistry of said rod, said method comprising the steps of:

- producing, within said rod manufacturing process, a lot of molten raw material to form said rod, said lot being formed of a plurality of chemical elements which affect said critical mechanical property of said rod, said plurality of elements including at least one chemical control element having a substantial affect upon said critical mechanical property;
- analyzing at least one sample of said lot to obtain a first chemistry therefor, said first chemistry including a current sampled level for each of said chemical elements that affect said critical property;
- applying said chemistry to said empirical model to calculate a floating aim level of said at least one chemical control element, said floating aim level equaling a level of said chemical control element needed to render the predicted value of said critical property equal to said target value for said critical property; and
- adjusting said first chemistry of the lot such that said predicted critical property equals said target value by adding to said lot an amount of said chemical control element equal to a difference between said floating aim level and said current sampled level.

5,462,614

METHOD OF PRODUCING SUPPORT FOR PLANOGRAPHIC PRINTING PLATE

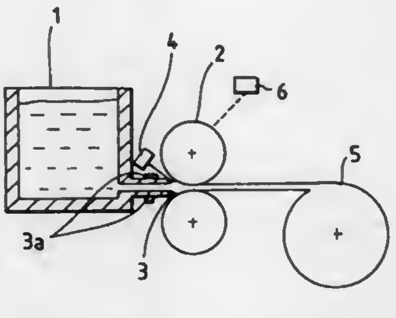
Hirokazu Sawada; Akio Uesugi, and Masaya Matsuki, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 8, 1994, Ser. No. 207,163

Claims priority, application Japan, Mar. 9, 1993, 5-072842; Nov. 1, 1993, 5-293834

Int. Cl.⁶ C22F *1/04*

U.S. Cl. 148—551 **13 Claims**



1. A method of producing a support for planographic printing plate comprising the steps of:

(a) supplying molten aluminum to a mold from a molten metal supply nozzle wherein a temperature gradient of the molten aluminum in the width direction of said molten metal supply nozzle is maintained within about 30° C. at a tip end of said nozzle;

(b) casting, in the mold, the molten aluminum into tabular aluminum;

(c) rolling, heat treating and correction of the tabular aluminum to obtain an aluminum support; and

(d) graining a surface of the aluminum support.

5,462,615

WELDABLE HIGH-STRENGTH STRUCTURAL STEEL WITH 13 CHROMIUM

Ingo Von Hagen, Krefeld; Rolf Popperling, Mülheim; Hubertus Schlerkmann, Roetgen, and Ulrike Zeislmair, Meerbusch, all of, Germany, assignors to Mannesmann Aktiengesellschaft, Dusseldorf, Germany

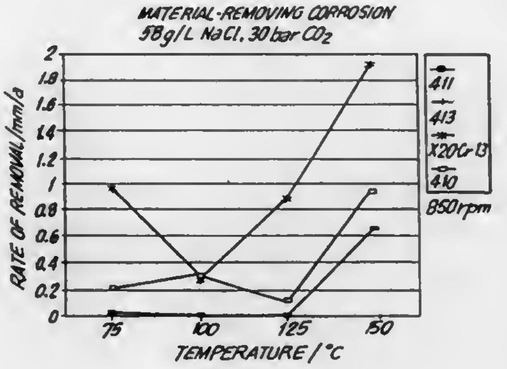
PCT No. PCT/DE92/00987, § 371 Date Jul. 25, 1994, § 102(e) Date Jul. 25, 1994, PCT Pub. No. WO93/11270, PCT Pub. Date Jun. 10, 1993

PCT Filed Nov. 23, 1992, Ser. No. 244,334

Claims priority, application Germany, Dec. 5, 1991, 41 40 459.9

Int. Cl.⁶ C21D *8/02;8/10*

U.S. Cl. 148—592 **12 Claims**



1. A process for producing items selected from the group of seamless steel pipes, flat strip products for pipes and flat sheet products for vessels, said pipes and vessels being intended for the conveyance, transport or processing of hydrocarbons containing CO_2 and water and optionally small proportions of H_2S and are resistant to stress crack corrosion and have good welding properties at the same time and a 0.2-percent elongation limit of at least 450 N/mm², the process comprising the steps of: heating a nickel-containing steel of the following weight percent composition:

min. 0.015%	C
0.15–0.50%	Si
max. 2.00%	Mn
max. 0.020%	P
max. 0.003%	S
12.0–13.8%	Cr
0.002–0.02%	N
0.01–0.05%	Nb

remainder iron and usual impurities,

wherein the nickel content is more than 0.0% and is limited to a maximum of 0.25%, the manganese content is at least 1.0%, the carbon content is limited to 0.035%, and 0.01 to 1.2% molybdenum is contained as an additional alloying component, to 1100°–1250° C.; roughing the steel in a first rolling phase at temperatures up to a maximum of 1000° C.; and then final rolling the steel in a second rolling phase at temperatures ranging from 850° C. to 750° C. with a minimum deformation of 30% to make rolled products.

5,462,616

PROCESS FOR PRODUCING A COMPOSITE MATERIAL COMPRISING OF AT LEAST TWO LAYERS

Edmund Goerenz, Alsdorf-Hoengen, Germany, assignor to Dyko Industriekeramik GmbH, Dusseldorf, Germany

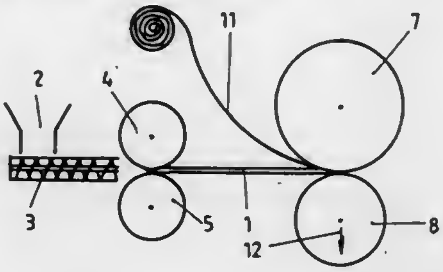
Filed Oct. 5, 1992, Ser. No. 956,676

Claims priority, application Germany, Jan. 11, 1991, 41 33 712.3

Int. Cl.^{6} B32B *31/00*

U.S. Cl. 156—85 **10 Claims**

1. A process for producing a layered composite material, comprising:



(a) making a [first] green layer of ceramic material by

(i) moistening raw materials and aggregates, wherein said raw materials and aggregates are selected from one of the group consisting of Al_2O_3, SiC, and ZrO_2;

(ii) mixing the moistened raw materials and aggregates together and forming the mixed and moistened raw materials and aggregates into a green layer of ceramic material; and

(iii) passing the green layer of ceramic material between a pair of nip rollers to form a plurality of weak contact surfaces thereon:

(b) passing the green layer of ceramic material and a layer of non-ceramic material between a pair of nip rollers to press the green layer of ceramic material and the layer of non-ceramic material together to form a first layer of the composite material:

(c) forming additional layers of the composite material while quantitatively decreasing the proportion of the green layer of ceramic material and quantitatively increasing the proportion of the layer of non-ceramic material with respect to each other in each additional layer of composite material so formed;

(d) combining said layers of composite material by rolling said layers of composite material together; and

(e) drying the combined layers of the composite material;

whereby, the green layer of ceramic material is decreased in its quantitative proportion with respect to the layer of non-ceramic material, while the quantitative proportion of the layer of non-ceramic material is simultaneously increased with respect to the green layer of ceramic material, from layer to layer of the composite material.

5,462,617

TIRE BONDING SYSTEMS

David L. Bender; William C. Bryan; William Brugman; Laurence Carlson, all of Muscatine, and Charles E. Fox, Durant, all of Iowa, assignors to Bandag Licensing Corporation, Muscatine, Iowa

Continuation of Ser. No. 845,930, Mar. 5, 1992, abandoned, which is a continuation of Ser. No. 755,000, Sep. 5, 1991, abandoned, which is a continuation-in-part of Ser. No. 530,305, May 30, 1991, abandoned. This application May 24, 1994, Ser. No. 248,526

Int. Cl.^{6} B29D *30/54;30/56*

U.S. Cl. 156—96 **16 Claims**

1. A method for bonding at least two elastomeric substrates together, wherein one of said substrates is a tire casing and another substrate is a tire tread, said method comprising the steps of:

subjecting said substrate to a priming treatment with a priming agent selected from the group consisting of a N-halohydantoin, N-halosulfonamide, a N-haloamide and a N-haloimide to form a primed substrate;

applying a heat-curable polyurethane adhesive composition to said primed substrate, said adhesive composition comprising a polyhydroxide compound curing agent and an aromatic isocyanate-terminated prepolymer, said aromatic isocyanate-terminated prepolymer being prepared by reacting an aromatic polyisocyanate with a compound selected from the group consisting of a polyether polyol and a polyester polyol;

contacting said substrates; and

heat-curing said contacted substrates under superatmospheric pressure to bond said substrates together.

5,462,618

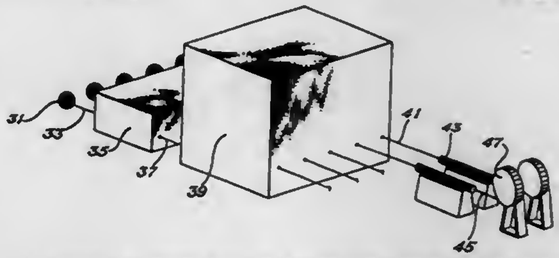
CONTINUOUS PROCESS OF MAKING UNIDIRECTIONAL GRAPHITE FIBER REINFORCED PULTRUDED RODS HAVING MINIMAL FIBER WAVINESS

Charles W. Rogers, Arlington; David A. Crane, Fort Worth, and Habib G. Rai, Bedford, all of Tex., assignors to Bell Helicopter Textron Inc., Fort Worth, Tex.

Division of Ser. No. 35,910, Mar. 23, 1993, Pat. No. 5,324,563. This application Jun. 2, 1994, Ser. No. 252,927

Int. Cl.^{6} B65H *81/00;* **B32B** *31/00;* **B29C** *67/00;71/00*

U.S. Cl. 156—161 **4 Claims**



1. A method of manufacturing a composite material of graphite fibers and resin matrix to increase compressive strength by minimizing wariness of the graphite fibers, comprising the continuous process steps of:

heating carbon fibers while being pulled to maintain fiber straightness to a temperature to at least partially convert the carbon fibers to graphite fibers;

continuously pulling multiple said graphite fibers through a die with a tension to straighten the graphite fiber and minimize waviness;

impregnating the graphite fibers while under said tension to produce a graphite fiber and resin composite material, the resin constituting at least 10 percent by volume of the composite material;

curing the resin of the composite rod while maintaining fiber tension to form a stiff composite rod of resin matrix containing graphite fibers sufficiently free of waviness such that the compressive strength of the rod approaches the tensile strength.

5,462,619

MASS TRANSFER DEVICE HAVING A HOLLOW FIBER BUNDLE

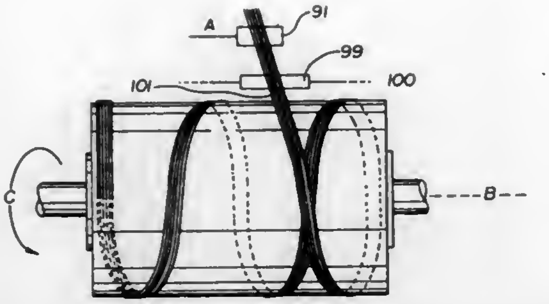
William S. Haworth, White Bear Lake; Robert W. Olsen, Plymouth, and Mark S. Goodin, Medina, all of Minn., assignors to Avecor Cardiovascular, Inc., Plymouth, Minn.

Division of Ser. No. 63,997, May 19, 1993, Pat. No. 5,376,334. This application Jul. 19, 1994, Ser. No. 276,950

Int. Cl.^{6} B65H *81/00;81/06*

U.S. Cl. 156—172 **18 Claims**

1. A method for helically winding continuous semi-permeable hollow fiber on a support core to produce a hollow fiber bundle for use in a radial flow mass transfer device comprising



a) providing a winding apparatus comprising a rotatable mounting member having a longitudinal axis and a fiber guide adjacent said mounting member, said fiber guide being adapted for reciprocal movement along a line parallel to the longitudinal axis of said mounting member as said mounting member rotates;

b) providing a support core having a first end, second end and an axis extending from said first end to said second end;

c) mounting said support core for rotation on said rotatable mounting member;

d) providing at least one continuous length of semipermeable hollow fiber, said hollow fiber being positioned by said fiber guide and secured to said support core; and

e) rotating said mounting member, moving said fiber guide reciprocally with respect to the longitudinal axis of the mounting member and winding said fiber onto said support core to form a hollow fiber bundle extending radially outward relative to the axis of the core and having packing fractions which increase radially outwardly in a major portion of said hollow fiber bundle thereby providing a packing fraction gradient.

5,462,620

CONTINUOUS PULTRUSION METHOD OF MAKING FRICTION UNITS

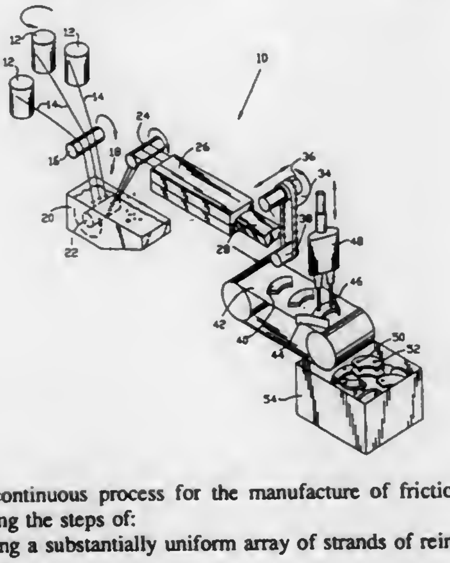
Benjamin V. Booher, Scottsdale, Ariz., assignor to Universal Design, Scottsdale, Ariz.

Division of Ser. No. 32,269, May 24, 1993, abandoned, which is a continuation-in-part of Ser. No. 647,137, Jan. 29, 1991, Pat. No. 5,156,787. This application Jun. 7, 1994, Ser. No. 255,081

The portion of the term of this patent subsequent to Oct. 20, 2009, has been disclaimed.

Int. Cl.^{6} B29C *70/52*

U.S. Cl. 156—180 **19 Claims**



1. A continuous process for the manufacture of friction units comprising the steps of:

selecting a substantially uniform array of strands of reinforcing fibers;

wetting said array of strands of reinforcing fibers with a resin material;

pulling said wetted strands of reinforcing fibers in a predetermined density and orientation through a composite forming die for forming a body having a peripheral configuration of said friction units;

solidifying said body by curing said resin; and

selectively cutting said body transverse to said strands into a plurality of said friction units, thereby forming a plurality of friction units having a predetermined distribution and orientation of fibers.

5,462,621

METHOD OF FORMING AN OPTICAL COMPENSATING PLATE OF A LIQUID CRYSTAL DISPLAY APPARATUS

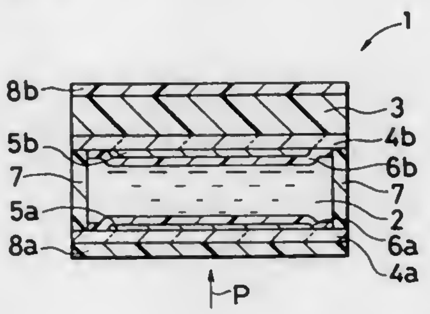
Yutaka Ishii, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 846,474, Mar. 6, 1992, abandoned, which is a division of Ser. No. 377,961, Jul. 11, 1989, Pat. No. 5,134,507. This application Oct. 19, 1993, Ser. No. 137,806

Claims priority, application Japan, Jul. 12, 1988, 63-174219

Int. Cl.^{6} B29C *65/02*

U.S. Cl. 156—229 **13 Claims**



1. A method of forming an optical compensating plate for use in combination with a liquid crystal layer in a liquid crystal display apparatus, comprising the steps of:

(a) stretching, monoaxially, each of a plurality of thermoplastic layers;

(b) overlaying, sequentially, each of the stretched layers so that the stretching direction is sequentially shifted from one layer to the next in a direction opposite to a twist direction of liquid crystal molecules of the liquid crystal layer and so that the total twist angle of all the layers is approximately equal in magnitude but opposite to the twist angle of liquid crystal molecules in the liquid crystal display apparatus, the angle between the stretching directions of the layers being at most 50 degrees;

(c) inserting the overlaid layers between a pair of transparent films;

(d) heating the overlaid layers to a temperature approximately 40° C. higher than the softening temperature of each of the overlaid layers, to partially melt each of the overlaid layers; and

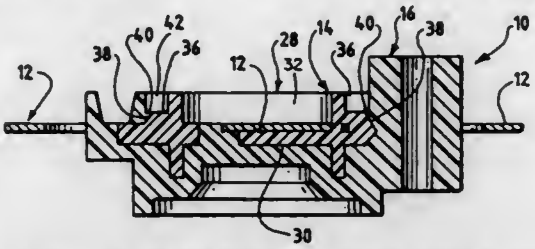
(e) applying pressure of approximately 3 kg/cm^2 to the heated overlaid layers, to form the optical compensating plate with the total twist angle of the overlaid layers.

5,462,622

MOLDING AN ELECTRICAL ELEMENT WITHIN A PREMOLD ELEMENT AND AN OVERMOLD ELEMENT TO PROVIDE A ONE-PIECE COMPONENT

Edith M. Small, New Lenox; Michael V. Prisby, Lockport, and Terry D. Thomason, Kankakee, all of Ill., assignors to Illinois Tool Works Inc., Glenview, Ill.

Filed Jun. 9, 1994, Ser. No. 257,589
Int. Cl.^{6} B29B *11/08;* B29C *45/16*
U.S. Cl. 156—245 **9 Claims**



1. A method of molding an electrical element within an associated plastic housing so as to provide a one-piece finished component wherein said electrical element, joints between said electrical element and said housing, and a seam between different portions of said housing are shielded so as to protect said electrical element from ambient atmosphere, comprising the steps of:

providing an electrical element;

insert molding selected portions of said electrical element within a premold member having predetermined means for supporting said premold member and said electrical element within an overmold mold, at least one lead of said electrical element extending to the exterior of said premold member for connection to a desired electrical circuit;

inserting said premold member and said electrical element within said overmold mold such that said means of said premold member for supporting said premold member and said electrical element support said premold member and said electrical element within said overmold mold, and molding selected portions of said electrical element and said premold member within an overmold member such that said means of said premold member for supporting said premold member and said electrical element within said overmold mold are not encapsulated within said overmold member, said at least one lead of said electrical element extends to the exterior of said overmold member for connection to said electrical circuit, and at least one surface of said premold member is unmolded by said overmold member so as to create a seam therebetween along said at least one surface; and

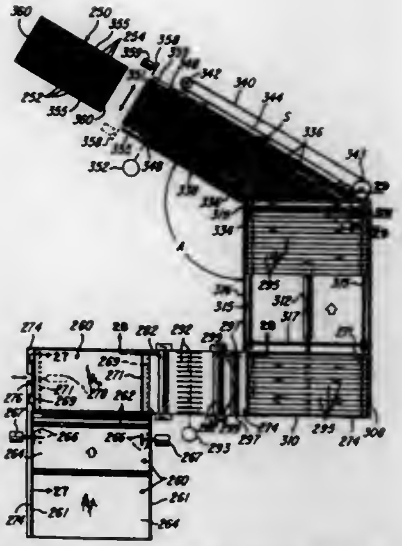
providing means for shielding said seam as well as any unmolded portions of said electrical element, except for said at least one lead of said electrical element, from ambient atmosphere so as to provide a one-piece finished component wherein said electrical element thereof, except for said at least one lead of said electrical element, is hermetically sealed from said ambient atmosphere so as to prevent contamination or degradation of said electrical element.

5,462,623

METHOD OF PRODUCTION OF REINFORCED FOAM CORES

Stephen W. Day, Dayton, Ohio, assignor to WebCore Technologies, Inc., Centerville, Ohio

Continuation-in-part of Ser. No. 877,985, May 4, 1992, abandoned. This application Aug. 6, 1993, Ser. No. 102,892
Int. Cl.^{6} B32B *31/04;31/18*
U.S. Cl. 156—250 **12 Claims**



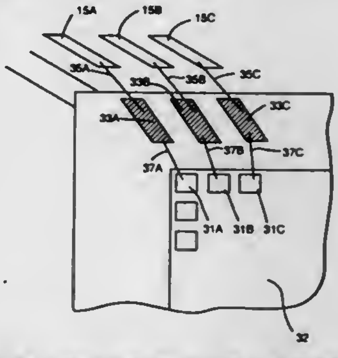
1. A method of producing generally rectangular reinforced foam core panels each having opposite side surfaces and two pairs of generally parallel opposite edge surfaces and adapted for use as a core between parallel skins attached to the side surfaces, the method comprising the steps of forming a plurality of flat boards of rigid plastics foam material with each board having at least one face with an overlying sheet of flexible web material, successively arranging the boards of foam material with the sheets of web material disposed between the boards to form a stack extending in a linear direction and with the boards and sheets of web material extending at a biascol angle relative to the linear direction, successively compressing the stack of boards and corresponding sheets of web material for continuously advancing the stack in the linear direction, adhesively connecting the boards and sheets of web material together within the stack, and successively cutting the stack at parallel spaced locations extending generally perpendicular to the linear direction of the stack to form core panels each having the boards and sheets of web material extending at an acute angle relative to all of the edge surfaces of the core panel and for extending the sheets of web material to all of the edge surfaces of the core panel.

5,462,624

EMBEDDED INTER-CONNECT FRAME

Young I. Kwon, San Jose, Calif., assignor to VLSI Technology, Inc., San Jose, Calif.

Continuation of Ser. No. 995,246, Dec. 22, 1992, abandoned. This application Apr. 26, 1994, Ser. No. 233,736
Int. Cl.^{6} B32B *31/00*
U.S. Cl. 156—257 **20 Claims**



1. A method for connecting an I/O pad of an integrated circuit die to an electrical lead on a lead frame, the method comprising the steps of:

forming a groove into a die attach pad surface, where the depth of said groove is a fraction of a thickness of said die attach pad;

forming an electrically insulating layer over said groove;

at least partly filling said groove with an electrically conducting material to form an electrically conducting groove region; and

connecting an electrically conducting wire between an I/O pad of an integrated circuit die affixed to said die attach pad and said conducting groove region of said die attach pad and between said conducting groove region of said die attach pad and an electrical lead on a lead frame.

5,462,625

MAKING REINFORCED TABBED OR INDEXED SHEETS

Dale M. Purcocks, 9 Claremont Villas, Glenageary County Dublin, Eire, Ireland

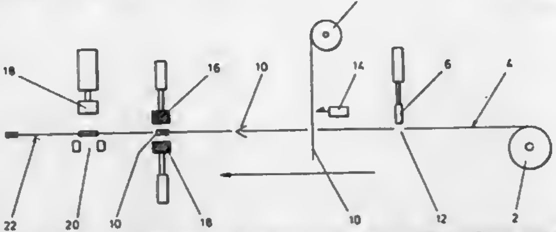
PCT No. PCT/GB92/01495, § 371 Date Jan. 19, 1994, § 102(e) Date Jan. 19, 1994, PCT Pub. No. WO93/03934, PCT Pub. Date Mar. 4, 1993

PCT Filed Aug. 12, 1992, Ser. No. 185,801

Claims priority, application Ireland, Aug. 12, 1991, 2840/91

Int. Cl.^{6} B32B *31/18*

U.S. Cl. 156—264 **19 Claims**



1. A method of producing a tabbed or indexed sheet from a web of paper, card, or cardboard sheet material, the method comprising the steps of cutting at least one aperture in the sheet material, inserting a length of reinforcing material through the aperture and securing the reinforcing material to the opposed faces of the sheet material, and cutting the sheet material to define a leading edge and a trailing edge for the sheet such that the sheet is separated from the remainder of the web of sheet material, whereby in cutting the sheet material to define the leading edge, a tab or indexed portion of the reinforcing material is obtained at the leading edge.

5,462,626

METHOD OF BONDING AN EXTERNAL LEAD AND A TOOL THEREFOR

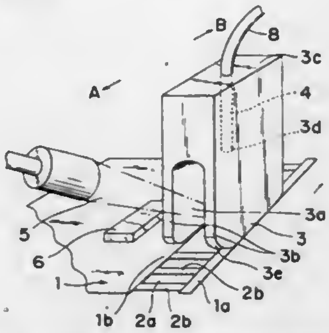
Shinji Kanayama, Kashihara; Akira Kabeshita, Hirakata; Kenichi Nishino, Osaka; Satoshi Ohnakada, Toyonaka; Takahiko Murata, Kadoma; Kazuhiro Kimura, Maebashi, and Kazuto Nishida, Katano, all of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jul. 29, 1993, Ser. No. 98,813

Claims priority, application Japan, Jul. 30, 1992, 4-203337; Jul. 31, 1992, 4-204854

Int. Cl.^{6} B32B *31/00*

U.S. Cl. 156—272.8 **14 Claims**



1. A method of bonding external leads, comprising the steps of:

registering the external leads of an IC component with electrodes of a circuit substrate, the external leads of the IC component having a flat outer tab of synthetic resin coating a plurality of outer end parts of the external leads;

setting an external lead holding surface of a bonding tool on the flat outer tab and bringing the external leads into contact with the corresponding electrodes;

irradiating a bonding part of one of the external leads registered with one of the corresponding electrodes with a laser beam while pressing the external lead against the electrode so as to bond the bonding part of the external lead with a bonding part of the electrode; and

jetting a cooling gas to the bonding part of the external lead to cool the bonding parts of the external lead and the electrode.

9. A bonding tool for bonding external leads of an IC component to electrodes of a circuit substrate, said bonding tool comprising:

a bonding tool body that comprises a wall member having an external lead holding surface on a lower side thereof adapted to be set on a flat outer tab on outer ends of external leads of an IC component for pressing one of the external leads against a corresponding electrode of a circuit substrate,

a laser beam passage defined by said bonding tool body adjacent to said wall member and adapted to receive a laser beam therethrough for irradiating a bonding part of an external lead,

a gas passage extending through said bonding tool body and intersecting said laser beam passage, said gas passage being adapted to receive a cooling gas therethrough and to jet the cooling gas therefrom to a bonding part of an external lead and electrode, and

a pressing member movable relative to said bonding tool body adjacent to said wall member for pressing an external lead against an electrode when the laser beam is irradiated.

5,462,627

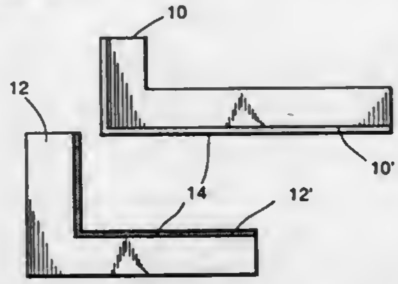
MICROWAVE BONDING OF STYROFOAM WITH PHENOL-FORMALDEHYDE COMPOUNDS

Susan L. Oldham, Torrance, and Jordan L. Rosengard, Woodland Hills, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Continuation of Ser. No. 139,683, Oct. 22, 1993, abandoned. This application Nov. 14, 1994, Ser. No. 339,316

Int. Cl.^{6} B32B *31/00*

U.S. Cl. 156—275.7 **9 Claims**



1. A method for bonding polystyrene foam details together, which consists of:

(a) providing polystyrene foam details including at least one shaped non-planar surface;

(b) applying a microwave curing adhesive coating consisting of water and a phenol-formaldehyde resin having a ratio of formaldehyde to phenol of about 1.8 to 2.3 on a molar basis and a solids content of 47 to 67% by weight to said surface of said polystyrene foam detail, wherein said coating has a thickness ranging from about 0.0001 to 0.01 inches (2.54×10^{-4} to 2.54×10^{-2} centimeters);

(c) placing said adhesive coated polystyrene foam detail in contact with an uncoated mating polystyrene foam detail to produce a mated assembly; and

(d) exposing said mated assembly to microwave energy for 20 to 45 seconds to cure said adhesive and produce a bonded assembly.

6. A method for bonding polystyrene foam details together, which consists of:

(a) providing polystyrene foam details including at least one shaped non-planar surface;

(b) applying a microwave curing adhesive coating consisting of water and a phenol-formaldehyde resin having a ratio of formaldehyde to phenol of about 1.8 to 2.3 on a molar basis and a solids content of 29 to 39% by weight to said surface of said polystyrene foam detail, wherein said coating has a thickness ranging from about 0.0001 to 0.001 inches (2.54×10^{-4} to 2.54×10^{-3} centimeters);

(c) placing said adhesive coated polystyrene foam detail in contact with an uncoated mating polystyrene foam detail to produce a mated assembly; and

(d) exposing said mated assembly to microwave energy for 30 to 45 seconds to cure said adhesive and produce a bonded assembly.

5,462,628

METHOD FOR BONDING TWO SURFACES TOGETHER

Alfred Viehbeck, Stormville; Martin Goldberg, Mahopac; Stephen L. Tisdale, Vestal; Stephen L. Buchwalter, Wappingers Falls; Kurt R. Grebe, Beacon, all of N.Y.; Caroline A. Kovac, Ridgefield, Conn., and Linda C. Matthew, Peekskill, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 11,831, Feb. 1, 1993, which is a continuation of Ser. No. 705,647, May 24, 1991, abandoned, which is a division of Ser. No. 290,486, Dec. 23, 1988, Pat. No. 5,242,713. This application Apr. 25, 1994, Ser. No. 232,417

Int. Cl.^{6} B32B *31/00*

U.S. Cl. 156—281 **18 Claims**

1. A method for bonding two surfaces together of organic polymeric material that is capable of transporting electrons in a reversible manner which comprises supplying electrons to redox sites of the polymeric material of both surfaces to cause a reversible electron transfer resulting in the redox state of said sites being in a reduced state; bringing together said surfaces whereby the reduced regions interpenetrate and form an interphase; and then reoxidizing the reduced interphase region to thereby bond the two surfaces together, wherein said organic polymeric material is a polyimide or a polyester.

5,462,629

SURFACE PROCESSING APPARATUS USING NEUTRAL BEAM

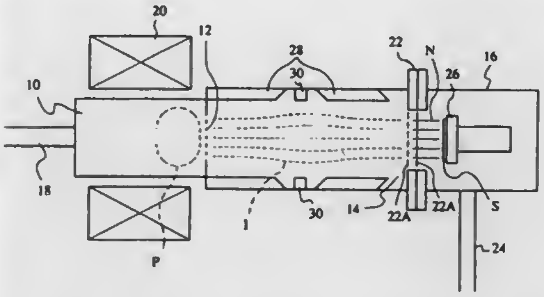
Naoki Kubota; Osamu Kinoshita, and Yoshio Kaneko, all of Chiba, Japan, assignors to Kawasaki Steel Corp., Hyogo, Japan

Filed Aug. 25, 1993, Ser. No. 111,598

Claims priority, application Japan, Aug. 28, 1992, 4-230033

Int. Cl.^{6} C23F *1/02*

U.S. Cl. 156—345 **6 Claims**



1. An apparatus for irradiating a surface of an object to be processed with a neutral beam, said object attached to a holder, said apparatus comprising:

converting means for converting an ion beam extracted from a plasma into the neutral beam; and

one of mesh-shaped ion retarding electrodes or a collimator allowing said neutral beam to pass and irradiate the object to be processed, said one of the mesh-shaped ion retarding electrodes or said collimator movable in a direction almost perpendicular to a beam axis direction.

6. An apparatus according to claim 1, wherein said holder is movable in a direction parallel to the surface of said object.

5,462,630

APPARATUS FOR PRODUCING PRECURED RETREADED TIRE

Tomoyuki Murakami, Innoshima, Japan, assignor to Innoshimaseiki Co., Ltd., Innoshima, Japan

PCT No. PCT/JP92/01084, § 371 Date Feb. 23, 1994, § 102(e) Date Feb. 23, 1994

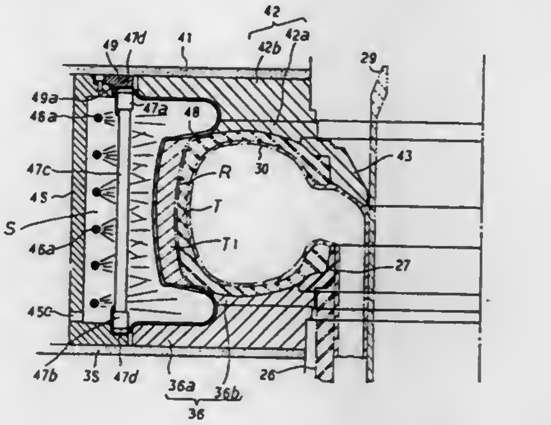
PCT Filed Aug. 24, 1992, Ser. No. 196,107

Claims priority, application Japan, Aug. 27, 1991, 3-298557

Int. Cl.^{6} B29D *30/56*

U.S. Cl. 156—421.2 **2 Claims**

1. An apparatus for producing a precured retreaded tire from a buffered tire, a plate of vulcanized rubber juxtaposed with a circumferential face of the buffered tire, and a member of unvulcanized linking rubber placed between the belt and the buffed tire comprising:



- a tire loader device for continuously providing a buffed tire;
- a lower ring device for receiving thereon the buffed tire from said tire loader device;
- a lower rack having form members which contact a lower side face of the buffed tire;
- an upper rack having an upper ring device for pushing the buffed tire placed on said lower ring device and form members for contacting an upper side of the buffed tire; and
- a heating furnace device movable in upward and downward directions for covering the outside of the buffed tire, said heating furnace device including a jacket for covering a circumference of the buffed tire, a heating device on an inner circumferential side of the jacket, and an envelope made of a deformable rubber sleeve inside the heating device,

wherein the lower ring device has a bladder insertable into the buffed tire by a related operation of the lower and upper ring devices, the envelope is engageable with the plate of vulcanized rubber by the use of fluid pressure, and the unvulanized linking rubber for the tire is vulcanizable by the heating device.

5,462,631

TAPE WINDING APPARATUS

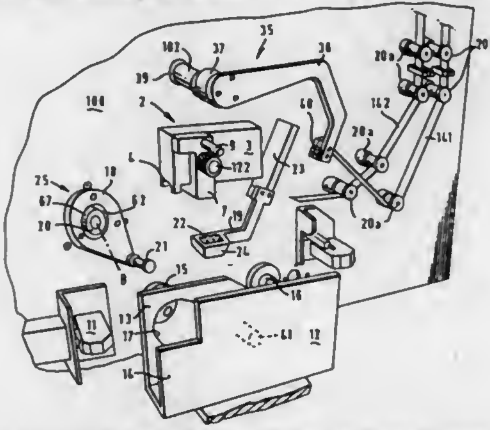
John P. Gardner, Grasson, Grotherington Fields, Grotherington Cross, Evesham Road, Cheltenham, Gloucestershire, United Kingdom

Continuation-in-part of Ser. No. 975,991, Nov. 13, 1992, abandoned, which is a continuation of Ser. No. 719,649, Jun. 6, 1991, abandoned, which is a continuation of Ser. No. 409,748, Sep. 20, 1989, abandoned, which is a continuation of Ser. No. 890,078, Jul. 24, 1986, Pat. No. 4,911,774. This application Feb. 1, 1993, Ser. No. 12,288

Claims priority, application United Kingdom, Jun. 17, 1991, 9112982; Jun. 17, 1991, 9112985; Jun. 17, 1991, 9112986

Int. Cl.^{6} B31F *5/00;* **G03D** *15/04*

U.S. Cl. 156—505 **22 Claims**



1. A tape winding apparatus comprising a use tape supply station, a tape splicing station disposed so as in use to receive on a tape splicing surface thereof use tape wound from the use tape supply station in use, a cassette holding station disposed so as in use to receive on a hub of a cassette disposed at said cassette holding station tape, which said cassette was wound from said tape splicing station, tape winding power means for driving said cassette hub to effect said winding of said tape, a plurality of tape guides defining with said splicing station a tape winding path from said tape supply station to said cassette hub, said plurality of tape guides including a final guide assembly for issuing tape to said cassette hub in winding of use tape from the use tape supply by the apparatus, said final guide assembly comprising leader extraction means comprising a leader extraction member and a final guide member, the leader extraction member having a rest position in which said member is disposed to penetrate beneath the non-extracted leader tape of the leader tape loop of a zero cassette charged to said cassette holding station and being mounted and arranged for two phases of reciprocatory displacement in the plane of said loop so that said leader extraction member can be removed from the locus of said cassette in a first phase of reciprocation to carry the leader tape loop externally from the cassette to said splicing surface of said splicing station and to the locus of said final guide member for release of said extracted tape loop and transfer thereof to said final guide member by said leader extraction member in a second phase of said reciprocatory displacement of said leader extraction member, said final guide member being displaceable laterally relative to the tape reciprocally between a position in and a position outside the plane of said loop at a final tape guiding location of the tape winding path at which said final guide member is otherwise fixed for rotation immediately upstream of and adjacent to the cassette input mouth, and said final guide member comprising a circularly cylindrical tape guide contact element which is mounted for rotation responsive to contact of its cylindrical surface in use by mobile tape winding to said driven cassette hub and guided by said tape guide contact element and which has a diameter sized too large to be accommodated beneath the aforesaid non-extracted leader tape of said cassette, tape cutting means disposed at said splicing station and addressing a cutting location at which tape is disposed on the splicing surface in use and tape splicing means for splicing tape ends together upon said splicing surface.

5,462,632

DEVICE FOR CHANGING THE ANGULAR RELATION BETWEEN A CAROUSEL CONVEYOR AND A KINEMATICALLY-LINKED LABELING GROUP OF A LABELING MACHINE

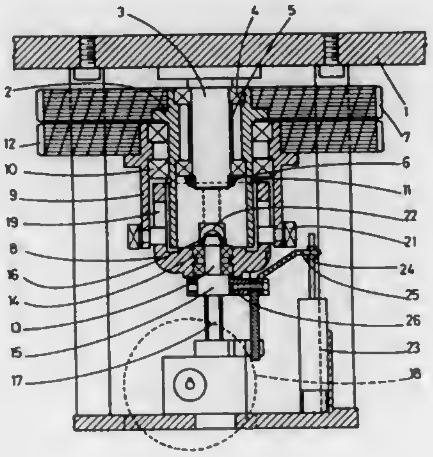
Vanni Zacche', Mantova; Ireneo Orlandi, S. Giorgio di Mantova, and Maurizio Pedercini, Marmirolo, all of, Italy, assignors to ALFA Costruzioni Meccaniche S.P.A., Mantova, Italy

Filed Dec. 28, 1993, Ser. No. 175,193

Claims priority, application Italy, Apr. 9, 1993, PR93A0013

Int. Cl.^{6} B65C *9/00*

U.S. Cl. 156—566 **7 Claims**



1. A device for changing an angular relation between the drive shaft of each of a carousel conveyor and a connected labeling machine, comprising:

a support frame;

an inner first hollow shaft and an outer second hollow shaft coaxially mounted to the support frame to rotate about an axis, the first hollow shaft to be coupled to the drive shaft of one of the conveyor and the labeling machine and the second hollow shaft to be coupled to the drive shaft of the other of the conveyor and labeling machine;

a joint coaxial with said first hollow shaft and said second hollow shaft and mounted with freedom to rotate about and move vertically along said axis; said joint having at least one longitudinal guide groove extending in the same direction as said axis and at least one guide groove at an angle to said axis; and

at least one pawl connected to said first hollow shaft and at least one pawl connected to said second hollow shaft, said at least one pawl connected to one of said first and second shafts engaging in a respective one of said at least one longitudinal and angled guide grooves;

the said at least one pawl of the other of said first and second shafts engaging in a respective groove of the other of said at least one longitudinal and angled guide grooves; and

means for moving said joint along said axis for rotating the angular position of said first and second hollow shafts relative to each other.

5,462,633

APPLICATOR-ROLLER ASSEMBLY FOR TAPE DISPENSER

Cristoph Manusch, Hemmingen; Udo Obersteller, Langenhagen, both of, Germany, and Willem Klaassen, Drunen, Netherlands, assignors to Pritt Produktionsgesellschaft mbH, Hanover, Germany

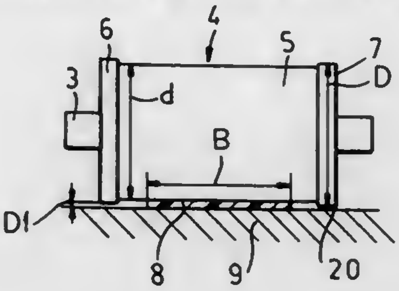
Continuation of Ser. No. 984,943, Dec. 3, 1992, abandoned. This application Jun. 29, 1994, Ser. No. 268,287

Claims priority, application Germany, Dec. 3, 1991, 41 39 808.4

Int. Cl.^{6} B32B ***31/00***

U.S. Cl. 156—577 **13 Claims**

1. In combination with a tape having a sticky side, a dispenser comprising:



- a housing adapted to hold a supply of the tape;
- a roller rotatable on the housing about an axis and having a mainly cylindrical outer surface projecting radially past the housing and having a relatively soft central portion;
- guide means for passing the tape partially around the roller with its sticky side turned radially away from the roller and with the tape engaging radially inwardly against the soft central portion of the roller surface, whereby the tape can be pressed by the roller against a substrate to adhere the tape to the substrate and to inwardly deflect at least the soft central portion of the roller surface; and
- means including a pair of relatively hard end flanges formed on the roller and axially aligned with and flanking the soft central portion of the roller surface out of contact with the tape for permitting deflection of the soft central portion of the roller surface in contact with the tape radially inward until the end flanges operatively engage the substrate and for preventing further radial inward deflection of the soft central portion of the roller surface even if the end flanges are pressed with greater force against the substrate.

5,462,634

SURFACE-TREATED ALUMINUM MATERIAL AND METHOD FOR ITS SURFACE TREATMENT

Shiro Kamiyama; Masanori Kosugi, both of Saitama; Masahiro Kurata; Sadao Shiraishi, both of Tokyo, and Nobuyoshi Sasaki, Tokyo, all of, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, and Sky Aluminium Co., Ltd., both of Tokyo, Japan

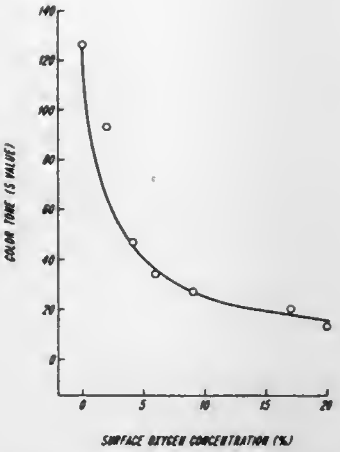
Division of Ser. No. 183,757, Jan. 21, 1994, abandoned. This application Jan. 31, 1995, Ser. No. 381,408

Int. Cl.^{6} C23C ***8/06***

U.S. Cl. 216—85 **23 Claims**

1. A method of treating the surface of an aluminum or aluminum alloy material to remove the oxide from said surface, comprising subjecting said material to a surface treatment with an aqueous solution containing at least 0.005 mol/lit. of a polyvalent metal ion blocking agent and at least 5 g/lit. of an organic amine and having no more than 100 ppm of phosphoric acid radical ion and no more than 500 ppm of sulfuric acid radical ion; and measuring the tristimulus values of color from an aluminum or aluminum alloy material that is being treated with said aqueous solution, said treatment being ended when the surface has a color tone (S) of:

$$S=(X^2+(.388Z-3Y)^2)^{1/2} \geqq 70$$



wherein X, Y and Z represent the tristimulus values of color.

5,462,635

SURFACE PROCESSING METHOD AND AN APPARATUS FOR CARRYING OUT THE SAME

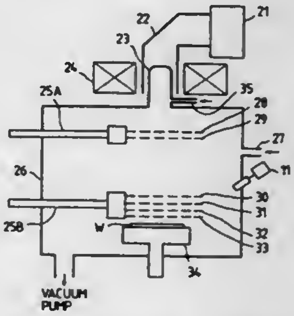
Tetsuo Ono, Kokubunji; Tatsumi Mizutani, Koganei, and Keizo Suzuki, Kodaira, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 827,394, Jan. 29, 1992, abandoned. This application May 31, 1994, Ser. No. 251,660

Claims priority, application Japan, Jan. 29, 1991, 3-008916

Int. Cl.^{6} H01L ***21/00***

U.S. Cl. 216—67 **3 Claims**



1. A surface processing method for carrying out surface treatment on a substrate, comprising the steps of: carrying out a surface treatment process using charged particles to remove a first portion of a layer overlying a substrate without exposing the substrate to the charged particles, said first portion constituting a majority of the layer, and carrying out a surface treatment process using only collimated uncharged particles to remove a second portion of the layer overlying the substrate to expose the substrate.

5,462,636

METHOD FOR CHEMICALLY SCRIBING WAFERS

George Y. Chen, Los Gatos, and Edward H. P. Lee, San Jose, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

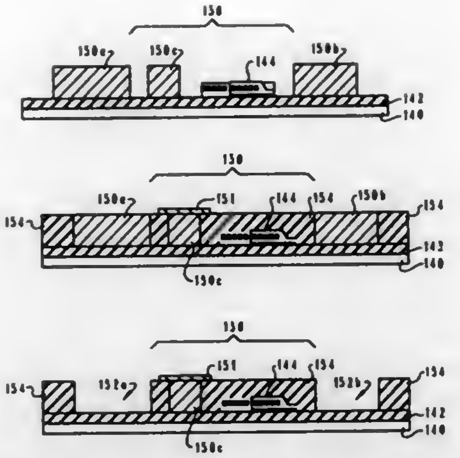
Filed Dec. 28, 1993, Ser. No. 174,108

Int. Cl.^{6} B44C ***1/22;*** **H01L** ***21/306;*** **C03C** ***15/00***

U.S. Cl. 216—17 **26 Claims**

1. A method for creating scribe lines on a wafer having an electronic device constructed therein, said method comprising:

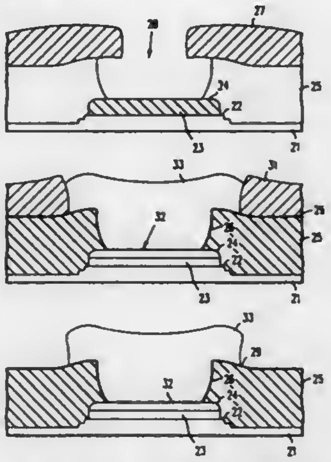
- forming a plurality of boundary segments to define a region on said wafer, wherein said region encompasses said electronic device;



- forming an insulating layer over said plurality of boundary segments, wherein said insulating layer covers said electronic device;
- removing a portion of said insulating layer such that each of said plurality of boundary segments is exposed; and
- etching away said plurality of boundary segments to expose said wafer and form a plurality of scribe lines, wherein cutting said wafer at said scribe lines to separate said electronic device from said wafer minimizes damage to said electronic device.

5,462,637
PROCESS FOR FABRICATION OF THIN FILM MAGNETIC HEADS

Martin Thiele, Spiesheim, Germany, assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Apr. 22, 1994, Ser. No. 231,074
Claims priority, application European Pat. Off., Jul. 22, 1993, 93111723
Int. Cl.^{6} B44C *1/22;* **C23F** *1/02*
U.S. Cl. 216—22 **54 Claims**

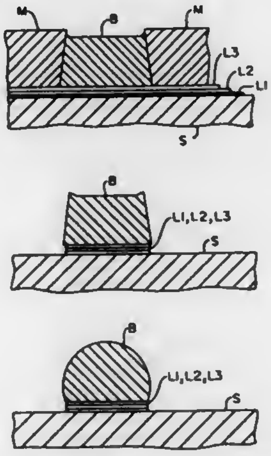


1. A process for fabricating a thin film magnetic head structure on a wafer, said structure including a plurality of studs, comprising the steps of:

- forming a first and a second magnetic pole tip comprising a first conductive material;
- forming a first stud layer comprising said first conductive material at each of a plurality of stud locations on said wafer;
- forming a second stud layer comprising a second conductive material over said first stud layer at each of said stud locations;
- covering said wafer with a layer of nonconductive material;
- applying a first mask to said wafer, said first mask having a plurality of openings, each opening disposed over one of said stud locations;
- removing said nonconductive material at each opening to expose a portion of said second stud layer at each of said stud locations;
- applying a seed layer of a third conductive material on said nonconductive layer and said exposed portions;
- applying a second mask to said wafer, said second mask having a plurality of openings, each opening disposed over one of said stud locations;
- applying a layer of a fourth conductive material in each of said openings of said second mask; and
- removing said seed layer from said nonconductive layer.

5,462,638
SELECTIVE ETCHING OF TIW FOR C4 FABRICATION

Madhav Datta, Yorktown Heights, and Ravindra V. Shenoy, Peekskill, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Jun. 15, 1994, Ser. No. 260,049
Int. Cl.^{6} H01L *21/00;* **B44C** *1/22;* **C23F** *1/02*
U.S. Cl. 156—656.1 **19 Claims**



13. A method for selectively dissolving Ti—W for a device including Ti and W to be removed and a protected metal, the protected metal selected from the group consisting of Al, Al—Cu, Cr—Cu, Cu, Pb, Sn, and Pb—Sn,

the method of selectively dissolving Ti—W comprising the steps of:

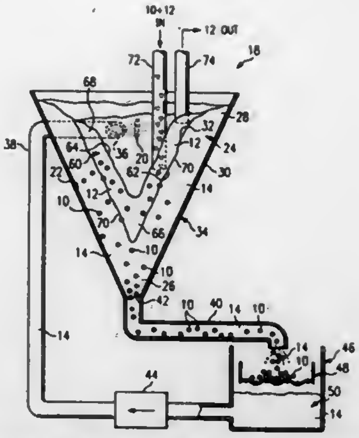
- adding to water between 15 and 40 grams of EDTA per liter of the water to make a solution; mixing between one and two parts by volume of the solution with between one and two parts by volume 30% by weight aqueous hydrogen peroxide to make a mixture;
- heating the mixture to between 40° C. and 60° C.; dissolving in the mixture a salt to an essentially saturated concentration, the salt dissociating in the water to passivate the one metal with a protective coating; and wetting the device with the mixture; so as to remove the Ti—W.

5,462,639
METHOD OF TREATING PARTICLES

Mark D. Matthews, Richardson, and Louanne K. Brown, Garland, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.
Filed Jan. 12, 1994, Ser. No. 181,070
Int. Cl.^{6} B01D *43/00*
U.S. Cl. 156—662.1 **20 Claims**

1. A method of separating at least one particle from a first liquid, the particle being denser than and being wetted by the first liquid, the method comprising:

- forming a forced vortex of a second liquid which is denser than the first liquid, the liquids being insoluble in each other; and



forming a forced vortex of the first particle-containing liquid by contacting the interior of the second liquid vortex with the first liquid, agitation at the interface of the vortices and the centrifugal force exerted on the particle by the vortices breaking the surface tension between the wetted particle and the first liquid and moving the particle into the second liquid.

5,462,640
ETCHING SOLUTION

Walter Stark, Forchheim, and Robert Ruprecht, Walzbachtal, both of, Germany, assignors to Kernforschungszentrum Karlsruhe GmbH, Karlsruhe, Germany

PCT No. PCT/DE92/00321, § 371 Date Dec. 22, 1992, § 102(e) Date Dec. 22, 1992, PCT Pub. No. WO92/19792, PCT Pub. Date Nov. 12, 1992

PCT Filed Apr. 21, 1992, Ser. No. 962,801

Claims priority, application Germany, Apr. 24, 1991, 41 13 283.1

Int. Cl.^{6} C09K *13/00;* C23F *1/00*

U.S. Cl. 216—103 **4 Claims**

1. A method of etching away a metal layer from a substrate, comprising:

providing an etching solution according to claim 1; and

immersing the substrate coated with the metal layer into the etching solution for a time effective to etch away the metal layer.

5,462,641
PROCESS FOR BLEACHING PULP WITH ADSORPTION OF METALS

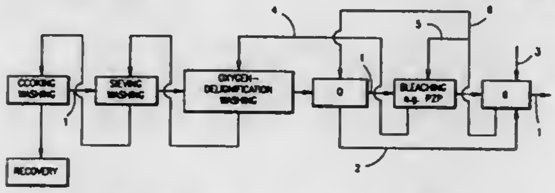
Anders Bergvist, Karlstad, and Hakan Dahllof, Edsvalla, both of, Sweden, assignors to Kamyr Aktiebolag, Karlstad, Sweden

Filed Jul. 7, 1993, Ser. No. 86,803

Claims priority, application Sweden, Sep. 7, 1992, 9202125

Int. Cl.^{6} D21C *9/147;9/153;9/16;11/00*

U.S. Cl. 162—40 **18 Claims**



1. A process for bleaching pulp comprising the steps of:

separating from a delignified pulp metals and metal ions to a flow of liquid;

bleaching the pulp;

contacting the flow of liquid containing metals and metal ions to the bleached pulp under conditions whereby the metals and metal ions are adsorbed into the bleached pulp and producing a liquid substantially free of metals and metal ions;

removing the liquid substantially free of metals and metal ions; and

supplying the liquid substantially free of metals and metal ions to an earlier stage of the bleaching process.

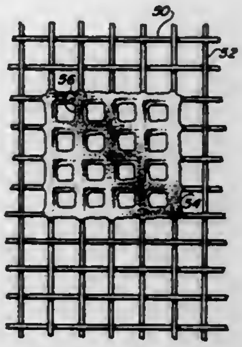
5,462,642
METHOD OF FORMING A FIBROUS MAT

Richard E. Kajander, 331 N. Dulton, Toledo, Ohio 43615

Filed Sep. 16, 1993, Ser. No. 123,019

Int. Cl.^{6} D21F *11/00*

U.S. Cl. 162—116 **7 Claims**



1. In a method for forming a nonwoven fibrous mat of generally random fiber orientation, including the steps of forming an aqueous fibrous slurry, depositing the slurry onto a permeable support while the support is moving through a fiber deposition zone, and drawing water from the slurry through the permeable support to cause a layer of fibers from the slurry to remain on the support, the improvement comprising:

coating discrete areas of the permeable support with a substance which reduces the permeability of the permeable support to water so as to restrict, but not block, the flow of water therethrough compared to adjacent areas of the support while still maintaining enough flow through said discrete areas to permit the deposition of fibers from the slurry in said discrete areas.

7. The improvement of claim 1, wherein the permeable support is comprised of a wire mesh screen, the substance coated thereon adhering to the wires of the screen to thereby reduce the spaces between the wires in the coated discrete areas of the screen.

5,462,643
METHOD FOR REPROCESSING SOLVENT MIXTURES CONTAINING CONSTITUENTS OF LOW VOLATILITY AND APPARATUS SUITABLE THEREFOR

Georg-Emerich Miess, Regensburg; Peter M. Roth, Eppstein; Karl Heinrich, Grossaitingen, and Siegfried Rewitzer, Ihrlerstein, all of, Germany, assignors to Hoechst Aktiengesellschaft, Germany

Filed Jun. 9, 1994, Ser. No. 257,638

Claims priority, application Germany, Jun. 12, 1993, 43 19 534.2

Int. Cl.^{6} B01D *1/00;3/00*

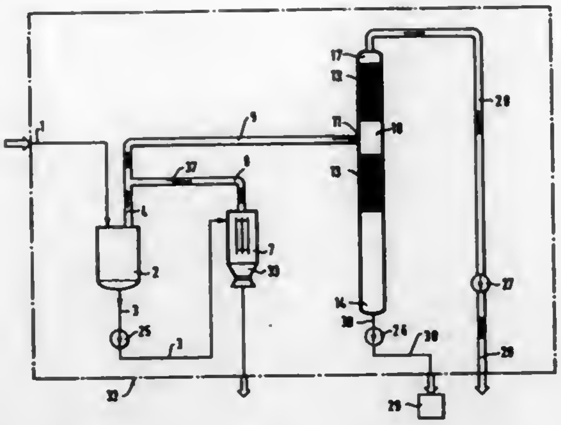
U.S. Cl. 203—72 **14 Claims**

1. A method for reprocessing mixtures which contain organic solvents and constituents of low volatility, comprising the steps of:

a) introducing the mixture into a concentration apparatus of a solvent recovery system,

b) concentrating the mixture in the concentration apparatus by evaporating a portion of a volatile fraction and feeding this portion of a volatile fraction to a separation column,

c) conducting at least a portion of the concentrated mixture from the concentration apparatus and introducing this portion into a separation apparatus, wherein the constituents of low volatil-



ity are separated from the concentrated mixture and are ejected from the solvent recovery system,

d) conducting the concentrated mixture, freed from the constituents of low volatility, from the separation apparatus and feeding the mixture together with the portion of the volatile fraction from step b) to the separation column,

e) separating the mixture from step d) in the separation column into a lower-boiling fraction which is removed via the column head and a higher-boiling fraction which is removed via the column bottom, and

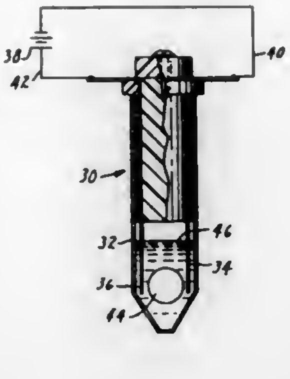
f) removing at least a portion of the lower-boiling fraction obtained according to step e) and of the higher-boiling fraction from the solvent recovery system.

10. A solvent recovery system for reprocessing mixtures which contain organic solvents and constituents of low volatility, comprising: a concentration apparatus, a separation apparatus, and a separation column connected together, means for introducing mixtures into the concentration apparatus of the solvent recovery system, means for conducting a vaporized volatile fraction from the concentration apparatus and for supplying this fraction to the separation column, means for conducting a concentrate comprising a higher-boiling constituents of the mixtures from the concentration apparatus, which means opens into the separation apparatus, a lock connected to the separation apparatus for discharging from the solvent recovery system the constituents of low volatility separated in the separation apparatus, an overflow line for the concentrate purified by removal of the constituents of low volatility in the separation apparatus, which overflow line connects directly into the separation column or into the means for conducting a vaporized volatile fraction from the concentration apparatus, whenever the overflow line and the means are connected together into the separation column, a means for leading a condensate from the separation column, and means for removing the higher-boiling fraction obtained in the separation column from the bottom and for ejecting the higher-boiling fraction from the solvent recovery system.

5,462,644
BIOFILM REDUCTION METHOD

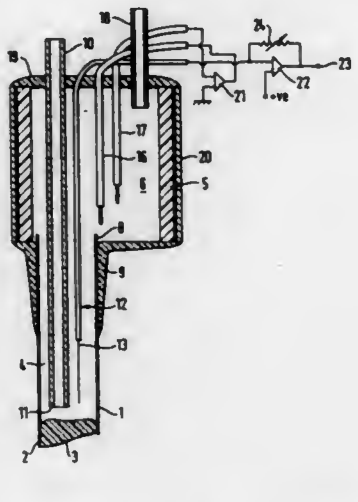
Lewis P. Woodson, Apple Valley, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.
Division of Ser. No. 816,157, Dec. 31, 1991. This application Jun. 10, 1994, Ser. No. 257,877
Int. Cl.⁶ C02F *1/48;1/68*
U.S. Cl. 204—131 **23 Claims**

1. A method of killing microorganisms in a biofilm comprising applying an electric field to an electrically conductive medium in which the biofilm is contained, no portion of the source of electric field being in contact with the biofilm and the strength of the electric field and the duration of application being sufficient to produce killing of microorganisms in the biofilm.



5,462,645
DIALYSIS ELECTRODE DEVICE

John W. Albery, Oxford, and Peter T. Galley, Crowthorne, both of, England, assignors to Imperial College of Science, Technology & Medicine, London, United Kingdom
PCT No. PCT/GB92/01736, § 371 Date May 18, 1994, § 102(e) Date May 18, 1994, PCT Pub. No. WO93/05701, PCT Pub. Date Apr. 1, 1993
PCT Filed Sep. 21, 1992, Ser. No. 211,080
Claims priority, application United Kingdom, Sep. 20, 1991, 9120144
Int. Cl.⁶ G01N *27/26*
U.S. Cl. 204—153.12 **11 Claims**



8. A method of monitoring the presence of an analyte in test matter, in which said analyte is separated from the test matter by diffusion through a dialysis membrane comprising the steps of:

(a) providing a dialysis electrode device having probe means including a hollow shank formed from a hollow fiber of dialysis membrane material and having an internal chamber delimited by said hollow fiber and a closed distal end, said probe means including conduit means for supplying electrolyte to said chamber and removing electrolyte therefrom, a working electrode extending into said chamber and a reference electrode,

(b) implanting said hollow shank in said test matter,

(c) supplying electrolyte to said chamber via said conduit means,

(d) separating said analyte from said test matter by diffusion through said dialysis fiber membrane and into said electrolyte,

(e) applying a potential difference between said electrodes, and

(f) detecting a resulting electrical signal in said working electrode to produce a signal representative of the concentration of said analyte diffused through said dialysis fiber membrane.

5,462,646

COATED CAPILLARY COLUMNS AND ELECTROPHORETIC SEPARATION METHODS FOR THEIR USE

Chia-Hui Shieh, Irvine, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Sep. 29, 1993, Ser. No. 128,914

Int. Cl.^{6} G01N *27/26;27/447*

U.S. Cl. 204—180.1 **18 Claims**

16. A process for analyzing a sample composition for sample constituents by capillary electrophoresis, said process comprising the steps:

providing a capillary electrophoresis column comprising:

a length of capillary tubing having an interior surface, a first end, and a second end said interior surface having charged chemical functionalities; and

a coating on said interior surface, said coating comprising crosslinked organic quaternary ammonium compounds capable of ionic interaction with said charged chemical functionalities of said interior surface;

immersing said first end in an anodic reservoir and immersing said second end in a cathodic reservoir;

introducing said sample composition into said length of capillary tubing at said first end or said second end; and

applying an electric field across said reservoirs, said electric field capable of causing said sample constituents to migrate at different rates with respect to each sample constituent within said capillary column.

5,462,647

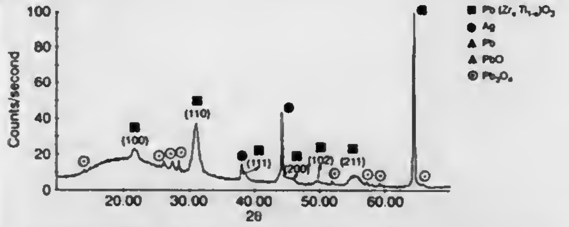
PREPARATION OF LEAD-ZIRCONIUM-TITANIUM FILM AND POWDER BY ELECTRODEPOSITION

Raghu N. Bhattacharya, Littleton, and David S. Ginley, Evergreen, both of Colo., assignors to Midwest Research Institute, Kansas City, Mo.

Filed Sep. 9, 1994, Ser. No. 303,439

Int. Cl.^{6} C25C *5/02*

U.S. Cl. 205—74 **26 Claims**



1. A process for the preparation of a lead-zirconium-titanium film, the process comprising the sequential steps of:

a) providing an electrodeposition bath comprising an electrolyte medium and a cathode substrate electrode;

b) providing to the bath soluble salts of lead, zirconium and titanium metals;

c) electrically energizing the bath to thereby direct ions of each respective metal in the bath to the substrate electrode to thereby cause formation of metallic particles as a film of lead-zirconium-titanium on the electrode; and

d) recovering the film.

5,462,648

METHOD FOR FABRICATING A METAL MEMBER HAVING A PLURALITY OF FINE HOLES

Kimihiro Wakabayashi, and Noriyuki Nebashi, both of Ebina, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

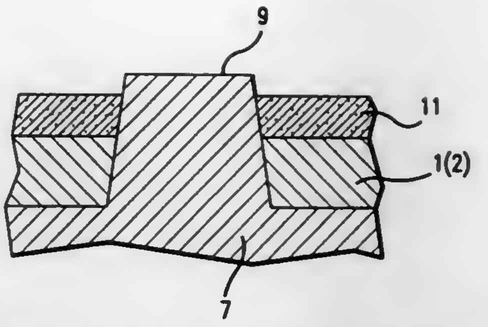
Filed Jul. 11, 1994, Ser. No. 272,429

Claims priority, application Japan, Sep. 27, 1993, 5-239382

Int. Cl.^{6} C25D *1/08*

U.S. Cl. 205—75 **10 Claims**

10. A method for fabricating a metal member having a plurality of fine holes, the method comprising the steps of:



forming a repeatedly usable master which includes a conductive substrate having a plurality of holes;

providing a non-conductive layer on one surface of the conductive substrate with non-conductive portions projecting from the non-conductive layer through the plurality of holes in the conductive substrate and projecting above an opposite surface of the conductive substrate, heights of the non-conductive portions projecting from the opposite surface of the conductive substrate being longer than a thickness of the metal member to be fabricated;

forming an electrodeposition film by subjecting the opposite surface of the conductive substrate to electrodeposition to form an electrodeposition film on the opposite surface of the conductive substrate having defined therein a plurality of non-electrodeposited holes corresponding in position to the non-conductive portions projecting from the opposite surface of the conductive substrate; and

separating the electrodeposition film from the master to obtain the metal member having the plurality of fine holes.

5,462,649

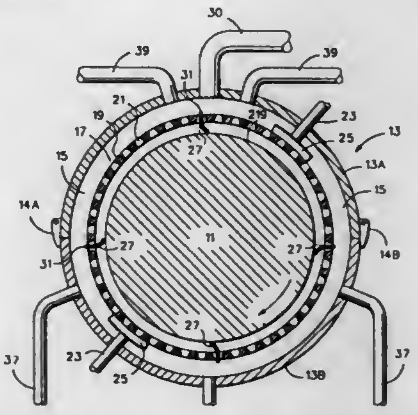
METHOD AND APPARATUS FOR ELECTROLYTIC PLATING

Harold M. Keeney, Whitehall; Erik S. Van Anglen, Quakertown, and James L. Forand, Whitehall, all of Pa., assignors to Electroplating Technologies, Inc., Northampton, Pa.

Filed Jan. 10, 1994, Ser. No. 179,520

Int. Cl.^{6} C25D *5/22*

U.S. Cl. 205—93 **35 Claims**



13. A method of electrolytic coating comprising:

(a) spacing an anode and a cathodic workpiece in close proximity to each other with a dielectric spacer material in the form of a series of thin substantially planar laterally extended contact blades mounted between said anode and cathodic workpiece within a liquid containing space with one edge of the contact blades contacting the cathodic workpiece surface along an extended narrow contact interface,

(b) establishing a charge between the anode and cathodic workpiece,

(c) establishing relative motion between the anode and the cathodic workpiece, and

(d) at the same time wiping the surface of the workpiece with the think, substantially planar laterally extended contact blades mounted adjacent the anode as the strip passes the anode, and

(e) wherein the contact blades are not greater than one-eighth inch in thickness in the contacting portions of the blades and wherein the anode is perforated to form orifices through which electrolytic coating solution may readily pass and the laterally extended contact blades force electrolyte from in front of the blades through the orifices in the anode in front of the blades and draws fresh solution through orifices in the anode behind the blades to the coating surface as the blade and the cathodic workpiece move relative to each other.

5,462,650

PROCESS FOR PRODUCING LOW VISCOSITY LUBRICATING BASE OIL HAVING HIGH VISCOSITY INDEX

Tetsuo Takito; Kazuki Inaba, both of Kanagawa; Yasuo Kinoshita, Okayama, and Teruhiko Sasaki, Tokyo, all of, Japan, assignors to Mitsubishi Oil Co., Ltd, Tokyo, Japan

Filed Sep. 30, 1993, Ser. No. 129,376

Claims priority, application Japan, Jan. 2, 1992, 4-287063

The portion of the term of this patent subsequent to Oct. 24, 2012, has been disclaimed.

Int. Cl.^{6} C10G *67/02*

U.S. Cl. 208—58 **12 Claims**

1. A process for producing a lubricating base oil which has a kinematic viscosity of 3.0 to 5.0 mm^2/s at 100° C., a viscosity index of 120 or more and a pour point of −10° C. or less, said process comprising:

(A) effecting hydrocracking of a stock oil of at least one of a heavy gas oil fraction and a light vacuum gas oil fraction, the stock oil containing about 60% by volume or more of distillate components within a distillation temperature range of from about 370° to about 480° C. and about 50% by mass or more of saturated hydrocarbons, in the presence of a hydrocracking catalyst comprising an amorphous silica alumina carrier which contains at least one of the group VIb metals in the periodic table and at least one of the group VIII metals in the periodic table to obtain a cracked product;

(B) separating the cracked product into a fuel oil fraction and a lubricating oil fraction by atmospheric distillation, thereby producing a high quality fuel oil; and

(C) subsequently subjecting the lubricating oil fraction to a dewaxing treatment, to which at least one of a solvent refining treatment and a hydrofinishing treatment is optionally applied, thereby producing a lubricating base oil which has a kinematic viscosity of about 3.0 to about 5.0 mm^2/s at 100° C., a viscosity index of 120 or more and a pour point of −10° C. or less.

5,462,651

HYDRODEAROMATIZATION OF HYDROCARBON OILS USING NOVEL "PHOSPHORUS TREATED CARBON" SUPPORTED METAL SULFIDE CATALYSTS

Chakka Sudhakar, Wappingers Falls; Frank Dolfinger, Jr., Poughkeepsie; Max R. Cesar, Newburgh; Mahendra S. Patel, Hopewell Junction, and Paul O. Fritz, Newburgh, all of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Aug. 9, 1994, Ser. No. 287,979

Int. Cl.^{6} C10G *45/46*

U.S. Cl. 208—143 **20 Claims**

1. A process for treating a charge hydrocarbon oil containing undesired aromatic components, sulfur and nitrogen compounds, which comprises:

maintaining a bed of a sulfided metal catalyst comprising 0.1 to 15% by weight of one or more metals of non-noble Group VIII selected from iron, cobalt and nickel; and at least one metal selected from 1 to 50% by weight tungsten and 1 to 20% by weight molybdenum and chromium based on the final catalyst weight, on a "phosphorus treated carbon" support, the "phosphorus treated carbon" support being characterized by

(1) having been prepared by heat treating mixtures of activated carbon and phosphorus compounds at temperatures greater than 450° C.,

(2) the phosphorus existing in the "phosphorus treated carbon" being bound to the carbon surface predominantly as polyphosphate species characterized by peaks between −5 and −30 ppm in the solid-state magic angle spinning ^{31}P nuclear magnetic resonance spectrum, and

(3) having a B.E.T. surface area of between 100 m^2/g and 2000 m^2/g, a total pore volume for nitrogen of at least 0.3 ml/g, and an average pore diameter of between 12 Angstroms and 100 Angstroms;

passing a charge hydrocarbon feed in the presence of a gas selected from pure hydrogen and a gas mixture comprising greater than 60 vol. % pure hydrogen into contact with said catalyst at hydrotreating conditions of 200° C.–450° C., a pressure of 200–3000 psig, a liquid hourly space velocity of 0.1–10 LHSV and hydrogen feed rate of 200–10,000 SCFB, thereby effecting hydrodearomatization, hydrodesulfurization and hydrodenitrogenation of said charge hydrocarbon feed containing undesired aromatic components, sulfur and nitrogen compounds, and forming a product stream of hydrocarbon containing a lesser quantity of undesired aromatic components, sulfur and nitrogen compounds; and

recovering said product stream of hydrocarbon containing a lesser quantity of undesired aromatic components, sulfur and nitrogen compounds.

5,462,652

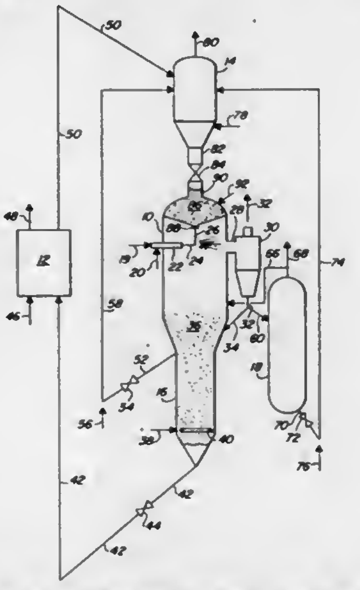
SHORT CONTACT FCC PROCESS WITH CATALYST BLENDING

David A. Wegerer, Lisle, Ill., assignor to UOP, Des Plaines, Ill.

Continuation-in-part of Ser. No. 216,378, Mar. 23, 1994, which is a continuation-in-part of Ser. No. 125,723, Sep. 24, 1993, Pat. No. 5,346,613. This application Aug. 16, 1994, Ser. No. 291,238

Int. Cl.^{6} C10G *11/18*

U.S. Cl. 208—167 **17 Claims**



1. A process for the fluidized catalytic cracking (FCC) of an FCC feed, said process comprising:

a) forming a falling curtain of FCC catalyst in a reaction zone by discharging a mixture of FCC catalyst downwardly from a discharge point;

b) contacting said falling curtain of catalyst with said FCC feed in said reaction zone by discharging said feed transversely into said falling curtain of FCC catalyst to crack hydrocarbons in said feed and produce lighter hydrocarbon products while coking said FCC catalyst;

c) separating hydrocarbon products from the coked FCC catalyst after a hydrocarbon to catalyst contact time of less than 1 second;

d) recovering a hydrocarbon product stream; passing a portion of said coked FCC catalyst to a regeneration zone and combusting coke from said coked FCC catalyst to produce a regenerated FCC catalyst having a carbon content of less than 0.1 wt %; and,

f) combining regenerated catalyst with coked catalyst to produce said mixture of FCC catalyst.

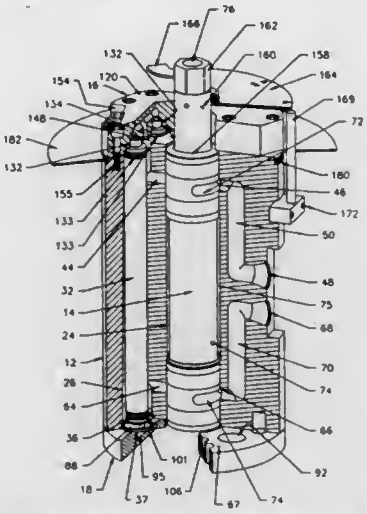
5,462,653
IMPROVED APPARATUS FOR CONTINUOUS POLYMER FILTRATION

William H. Hills, Melbourne Village, Fla., assignor to Hills, Inc., West Melbourne, Fla.

Filed Feb. 15, 1994, Ser. No. 196,867

Int. Cl.^{6} B01D *33/00*

U.S. Cl. 210—85 **29 Claims**



24. A filter apparatus for uninterruptably filtering molten polymer comprising:

supply means for flowing molten polymer under pressure;

a plurality of separate filter paths containing respective removable filters therein;

valve means for simultaneously apportioning said flowing polymer among said plurality of filter paths in parallel, said valve means having a normally neutral state wherein substantially equal flow is simultaneously provided into and out from each of said filter paths, a first plurality of states in each of which flow is completely blocked into and out from a respective selected filter path, and a second plurality of states in each of which trickle flow is allowed into a respective selected filter path while flow out therefrom is completely blocked;

means for selectively bleeding air and air-entrained polymer from said respective selected path in said second state; and

passage means for combining polymer flow from said plurality of separate filter paths into a common outflow path.

5,462,654
DYNAMIC MOVING FILTER APPARATUS

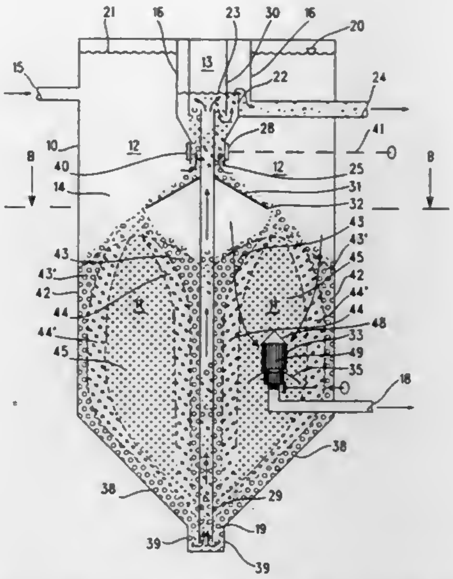
C. J. Hering, Jr., 2920 NW. 67 Ct., Fort Lauderdale, Fla. 33309

Filed Sep. 29, 1993, Ser. No. 128,125

Int. Cl.^{6} B01D *24/48;24/28*

U.S. Cl. 210—97 **25 Claims**

24. A filter apparatus for filtering unwanted contaminants from a liquid introduced into said filter apparatus, said filter apparatus comprising:



a vessel having an inlet means for introducing a liquid into a first chamber in said vessel, said first chamber supporting a filter bed of a filter material, said filter material being granular and multi-textured, ranging from a most coarse texture to a medium texture, to a most fine texture, said filter bed for filtering said liquid, said vessel including an outlet means for dispensing filtered liquid as a filtrate from said vessel, and a first liquid level control means for maintaining a level of said liquid in said first chamber at a first predetermined level, and a second chamber, positioned in said first chamber, spaced from a bottom region of said first chamber;

a conduit means connecting said first chamber with said second chamber for conducting a first portion of said liquid and a part of said filter material from said filter bed to said second chamber from said first chamber and for depositing a said first portion of said liquid and said part of said filter material in said second chamber, said second chamber including a second liquid level means for maintaining said first portion of said liquid in said second chamber at a second level for creating a flow of said first portion of said liquid through said conduit means from said first chamber to said second chamber and for carrying with said flow said part of said filter material from said filter bed, and a first opening in said second chamber having an opening approximating a mid-point on a diameter of a cross section of said filter bed for providing egress for said part of said filter material for leaving said second chamber and returning to said filter bed;

a conical deflector plate located in said first chamber and having an apparent apex approximating said mid-point on said diameter of said cross section of said filter bed, said conical deflector plate having an uninterrupted incline surface extending from said apparent apex to an edge, said edge approximating a mid-point on a radius of said cross section of said filter bed, said uninterrupted inclined surface for deflecting said part of said filter material returning to said filter bed to a predetermined drop zone on said filter bed for permitting said part of said filter material to be classified according to texture during a drop from said edge for forming a filter bed of a plurality of torus shaped, vertically extended, discrete layers of granular filter material defined by a first torus shaped, vertically extended, discrete layer of said most fine texture granular filter material approximating said mid-point of said radius of said filter bed, said first torus shaped layer interposed between a second torus shaped, vertically extended, discrete layer of said medium texture granular filter material and a third torus shaped, vertically extended, discrete layer of said medium texture granular filter material, said second torus shaped layer interposed between said first torus shaped layer and a fourth torus shaped, vertically extended, discrete layer of most coarse texture granular filter material and said third torus shaped layer interposed between said first torus shaped layer and a fifth torus shaped, vertically extended, discrete layer of most coarse texture granular material;

said outlet means defined by a filtrate recovery chamber positioned in said first torus shaped, vertically extended, discrete layer of most fine granular filter material, said filtrate recovery chamber including a closed top, a closed bottom and side walls between said closed bottom and said closed top, said side walls including a perforated portion thereof for permitting passage of filtrate therethrough, a deflector plate located adjacent said closed bottom of said filtrate chamber and downstream, in a direction of movement of said filter bed, along said side walls, said deflector plate coupled, at one end thereof to said filtrate recovery chamber and extending to a free end thereof into said first torus shaped layer of said most fine granular filter material for checking movement of a portion of said first torus shaped layer of said most fine granular filter material moving along said perforated side walls of said filtrate recovery chamber; and

a conductor means connected to said closed bottom for conducting said filtrate from said filtrate recovery chamber and said vessel.

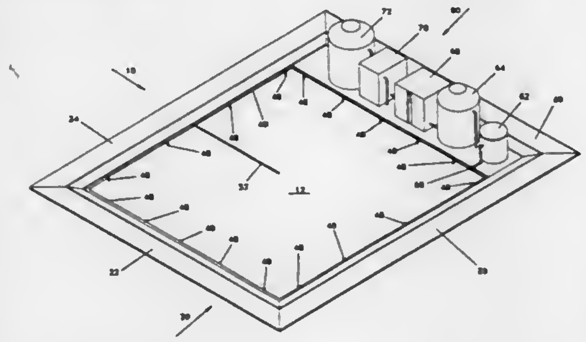
5,462,655

VEHICLE CONTAINMENT MAT WITH VACUUM RECOVERY AND RECYCLE MEANS

Michael Ladd; June E. Ladd, both of 2602 E. Bluefield Ave., Phoenix, Ariz. 85032; Larry Hinebaugh, P.O. Box 6252, Cedar City, Utah 84721; Jack E. Hennessy, and Susan C. Hennessy, both of 15887 Trevino Dr., Fountain Hills, Ariz. 85032

Filed Sep. 20, 1993, Ser. No. 124,167
Int. Cl.^{6} B01D *36/00*

U.S. Cl. 210—167 **27 Claims**



1. A fluid recapture system for use with vehicle washing procedures comprising:

a) a containment mat;
b) a berm surrounding the containment mat, the berm including a foam core;
c) a vacuum system located on the containment mat, the vacuum system comprising a vacuum hose and at least one pickup head attached to the vacuum hose, the pickup head being in fluid communication with the surface of the containment mat; and
d) recycling apparatus connected to the vacuum system, the recycling apparatus including a vacuum pump for withdrawing fluid from the containment mat through the vacuum system and into the recycling apparatus.

10. A fluid recapture system for use with vehicle de-icing procedures comprising:

a) a containment mat including a mat heater positioned around the periphery of and under the containment mat to prevent fluids contained thereon from freezing;
b) a berm surrounding the containment mat;
c) a vacuum system located on the containment mat; and
d) fluid waste storage apparatus connected to the vacuum system, the fluid waste storage apparatus including a vacuum pump for withdrawing fluid from the containment mat through the vacuum system and into the fluid waste storage apparatus.

22. In combination, a containment mat and a berm for use in a fluid recapture system comprising:

a) a containment mat comprising a first layer of fluid impermeable material mounted on a second layer of base material, the fluid impermeable material being substantially chemically inert;
b) a berm surrounding the containment mat, the berm comprising a generally triangular foam core having an outer core portion and an inner core portion, the inner core portion being approximately twice as wide as the outer core portion;
c) an inside batten bar located adjacent the inner core portion to secure the containment mat and the foam core in place; and
d) a vacuum system located on the containment mat.

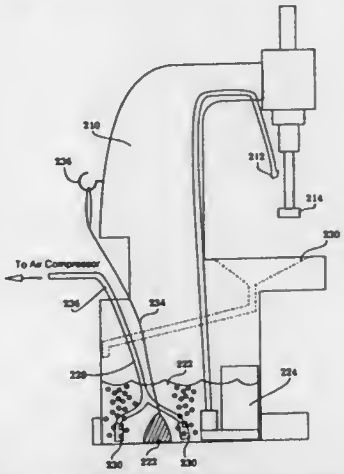
5,462,656

CUTTING OIL TREATMENT APPARATUS

Robert Stanlec, Playa del Rey, Calif., assignor to Harvey Universal, Inc., Torrance, Calif.

Division of Ser. No. 42,120, Apr. 2, 1993, Pat. No. 5,314,620. This application Mar. 1, 1994, Ser. No. 205,944
Int. Cl.^{6} C02F *3/10*

U.S. Cl. 210—150 **8 Claims**



1. An improved apparatus for machining metal, said apparatus comprising:

(a) cutting oil delivery nozzle, said nozzle being adapted to provide cutting oil to a cutting area;
(b) a cutting area including a bit for machining metal;
(c) a cutting oil retrieval means to remove used cutting oil from the cutting area and return it to a cutting oil reservoir;
(d) a cutting oil reservoir;
(e) an aeration means located within the cutting oil reservoir, said aeration means acting to increase the oxygenation of cutting oil in the cutting oil reservoir; and
(e) a cultured nitrifying bacteria source located in said cutting oil reservoir.

5,462,657

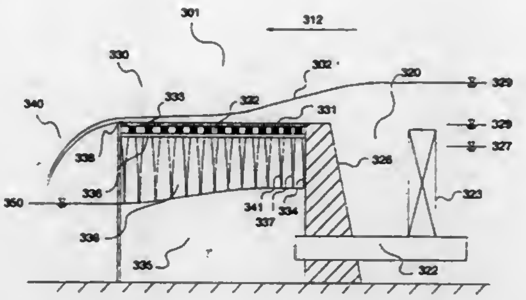
AERATION SYSTEM

Tony A. Rizk, Oliver Springs, and Gary E. Hauser, Knoxville, both of Tenn., assignors to Tennessee Valley Authority, Muscle Shoals, Ala.

Filed Sep. 17, 1993, Ser. No. 121,858
Int. Cl.^{6} C02F *3/24*

U.S. Cl. 210—170 **19 Claims**

1. An improved passive aeration system for effecting enhanced gas phase to liquid phase transfer, including increasing the dissolved oxygen content of water, said system comprising:



(a) regulation means for effecting a resulting substantially first horizontally disposed flow in said liquid phase and for directing flow thereof over at least a portion of later mentioned infuser means; and

(b) infuser means for effecting at least a portion of said gas phase to liquid phase transfer, said infuser means having:

(i) first reregulation means for directing at least a portion of said substantially first horizontally disposed flow resulting from said regulation means into a first stage of downwardly directed liquid fall and into at least one additional stage of downwardly directed liquid fall, said first stage of directed liquid fall and said at least one additional stage thereof separated longitudinally from one another or adjacent to one another and disposed for operative association with at least a portion of said gas phase, and said first reregulation means disposed for entry of liquid from said regulation means into said at least one additional stage of liquid fall subsequent to entry of liquid from said regulation means into said first stage of directed liquid fall; and

(ii) second reregulation means for effecting recombination and subsequent further reregulation of said first stage of directed liquid fall and said at least one additional stage thereof into a second generally horizontally disposed flow stream;

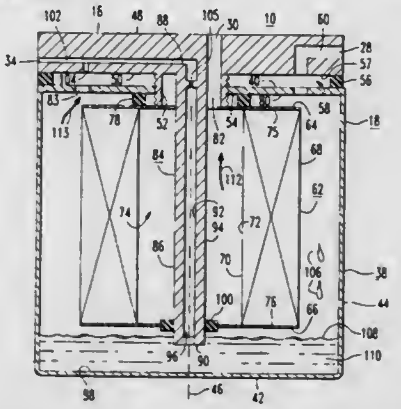
whereby the residence time of discontinuities in the resulting recombined second flow stream, said discontinuities including entrained gas bubbles effected at least in part by impingement on said second flow stream by said first stage of directed liquid fall, is substantially increased by reentrainment of such discontinuities as they are subjected to subsequent impingement action by said at least one additional stage of directed liquid fall.

5,462,658
FUEL FILTER SYSTEM

Thomas R. Sem, Plymouth, Minn., assignor to Thermo King Corporation, Minneapolis, Minn.

Filed Jan. 14, 1994, Ser. No. 182,915
Int. Cl.^{6} B01D *35/01*

U.S. Cl. 210—172 **13 Claims**



1. A fuel filter system for conditioning fuel flowing from fuel supply means to an internal combustion engine via a fuel flow path which includes pumping means, comprising:

fuel conditioning means including a fuel filter head and a fuel filter cartridge having a filter element, said cartridge having opposed upper and lower ends;

said fuel filter head having fuel inlet and fuel outlet ports respectively adapted for connection in the fuel flow path between the fuel supply means and the internal combustion engine,

means for releaseably securing the upper end of said fuel filter cartridge to the fuel filter head, and to cooperatively define fuel inlet and fuel outlet chambers between said filter head and said cartridge, inlet passage means for fluidly connecting said fuel inlet port to said fuel inlet chamber, and outlet passage means for fluidly connecting said fuel outlet port to said fuel outlet chamber, whereby fuel is directed from the fuel inlet port and fuel inlet chamber through the filter element to the fuel outlet chamber and fuel outlet port of the fuel filter head, while separating water and other fuel contaminants from the fuel;

said fuel filter head defining a contaminant outlet port,

a collection means disposed external to said fuel conditioning means;

means connecting said contaminant outlet port in continuous fluid flow communication with said collection means, with said collection means being at a lower pressure than said fuel conditioning means during operation of the internal combustion engine;

bleed tube means having first and second ends;

said filter head defining first fluid flow path means for connecting said first end of the bleed tube means in fluid flow communication with said contaminant outlet port;

said second end of the bleed tube means being located within the fuel inlet chamber of the fuel filter cartridge adjacent said lower end where water and other fuel contaminants separated from the fuel tend to collect, to continuously force water and other fuel contaminants to be delivered to said collection means via the contaminant outlet port during operation of the internal combustion engine;

and a second fluid flow path means defined by said fuel filter head which interconnects a portion of said fuel inlet chamber adjacent said filter head with said contaminant outlet port, forcing air in the fuel inlet chamber to flow to said collection means via the contaminant outlet port during operation of the internal combustion engine.

5,462,659
CHROMATOGRAPHY COLUMN

Vinit Saxena, Pleasanton, and Paul Young, Walnut Creek, both of Calif., assignors to Sepragen Corporation, San Leandro, Calif.

Filed Jun. 15, 1993, Ser. No. 77,427
Int. Cl.^{6} B01D *15/08*

U.S. Cl. 210—198.2 **24 Claims**

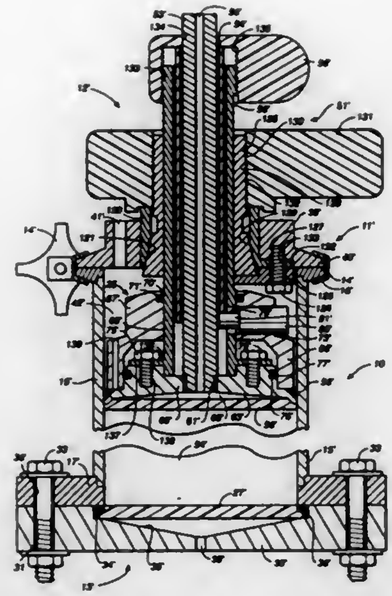
1. An axial flow chromatography column, comprising:

a housing having flanges at both ends and operatively connected to an outlet head assembly at one end which includes a central opening and a tapering upper surface and an adjuster assembly at the other;

a pair of bed support frits located within said housing and adapted to retain a bed of chromatographic medium therebetween and wherein said pair of frits each has one side having a convex configuration, said convex configured sides being located oppositely with respect to an associated bed of chromatography medium;

a pair of seal means located within said outlet head assembly and constructed so as to retain a peripheral edge of one of said frits and wherein said pair of seal means consists of a horizontal section and a reversed L-shaped section, with said peripheral edge of said one frit being located within said reversed L-shaped section;

a top assembly adapted to be removably connected to said housing;



means for removably connecting said top assembly to said housing flange;

a bed adjuster assembly located in said housing and said top assembly;

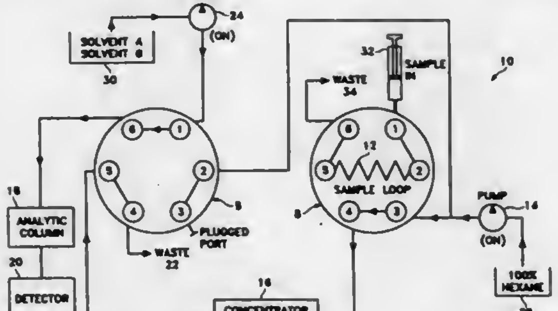
a locking mechanism mounted in said top assembly for releaseably retaining said bed adjuster assembly, such that release of said locking mechanism enables rapid height adjustments of said bed adjuster assembly; and

means for making fine height adjustments of said bed adjuster assembly.

5,462,660
HIGH PERFORMANCE LIQUID CHROMATOGRAPHY INJECTION SYSTEM FOR THE SIMULTANEOUS CONCENTRATION AND ANALYSIS OF TRACE COMPONENTS

John A. Singleton, Apex, and Larry F. Stikeleather, Raleigh, both of N.C., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Apr. 22, 1994, Ser. No. 243,951
Int. Cl.^{6} B01D *15/08*
U.S. Cl. 210—198.2 6 Claims



1. A high pressure liquid chromatography apparatus comprising an injection system for simultaneously concentrating and analyzing trace components which includes

a first multi-port valve that includes a sample loop and an injection port and provides an equilibration flow path means and an injection flow path means for equilibrating a concentration column and injecting sample into the apparatus,

a second multi-port valve for providing an equilibration flow path means for equilibrating an analysis column and providing an analysis flow path means for transferring sample on a concentration column to an analysis column and a detector means,

an first pumping means for pumping a first solvent for equilibrating said concentration column, and

a concentration column, wherein said analysis flow path means for analyzing trace components includes

a second pumping means in fluid communication with a second solvent container and at least two ports of said second multi-port such that a solvent from said second solvent container flows through said at least two ports of the second multi-port valve out to at least two ports of the first multi-port valve,

a second multi-port valve in fluid communication with said second pumping means and said first multi-port valve and is in fluid communication with said concentration column and said analysis column through at least two ports different from said ports in fluid communication with said second pumping means and the first multi-port valve,

a first multi-port valve in fluid communication with said second multi-port valve and said concentration column such that solvent flows from said second multi-port valve through at least two ports of said first multi-port valve to said concentration column,

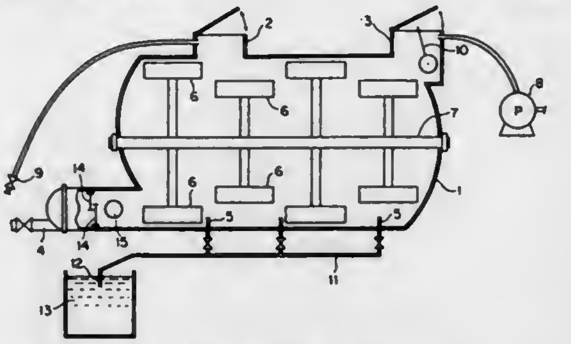
a concentration column in fluid communication with said first multi-port valve and said second multi-port valve such that solvent flows through said concentration column from first multi-port valve to at least two ports in said second multi-port valve and into an analysis column, and

an analysis column in fluid communication with at least two ports in the second multi-port valve and a detector such that solvent flows from said second multi-port valve through the analysis column and into said detector.

5,462,661
SOLID-LIQUID SEPARATOR FOR SLUDGE

Motohito Nasu, 21-21, Harayama 4-chome, Urawa-shi, Saitama-ken, Japan

Filed Nov. 29, 1993, Ser. No. 158,617
Claims priority, application Japan, Apr. 12, 1993, 5-107231
Int. Cl.^{6} C02F *1/52;11/14*
U.S. Cl. 210—206 2 Claims



1. A solid-liquid separator for sludge comprising:

a sludge recovery tank including a sludge suction port and an intake/exhaust port movable between open and closed positions and provided at an upper portion of said tank, and a sludge discharge port movable between open and closed positions and provided at one end of a bottom portion of said tank;

a plurality of agitating blades capable of being driven in normal and reverse rotations installed in said tank;

a plurality of injection nozzles for a sludge coagulant and air are internally mounted on said bottom portion of said tank enabling injection of coagulant and air evenly and into the entire volume of sludge contained in the tank;

means connecting said intake/exhaust port to an intake/exhaust pump;

said intake/exhaust pump operating in the exhaust mode creating a vacuum in said sludge recovery tank prior to and during entry of sludge into said sludge recovery tank;

said intake/exhaust pump operating in the exhaust mode creating a vacuum in said sludge recovery tank during injection of coagulant and air into said sludge recovery tank; and

said intake/exhaust pump operating in the intake mode pressurizing said sludge recovery tank during discharge of sludge from said sludge recovery tank.

5,462,662

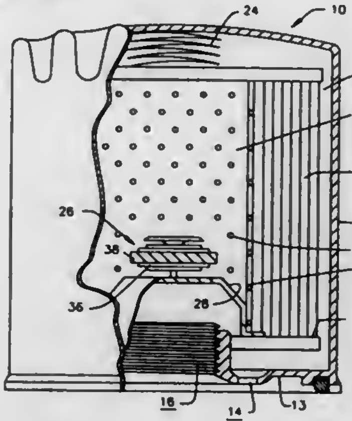
OIL FILTER STRUCTURE

Chin-Chuan Chen, No. 46-1, Sec. 5, Nang King E. Rd., Taipei City, Taiwan, Prov. of China

Filed Sep. 12, 1994, Ser. No. 304,125

Int. Cl.^{6} B01D *35/06*

U.S. Cl. 210—223 **20 Claims**



1. An oil filter comprising:

a housing having a bottom, the bottom having an inlet and an outlet formed thereon;

a foraminated sleeve in the form of a cylinder having a first diameter with a plurality of apertures formed thereon, disposed inside the housing to define therein a first space enclosed by the sleeve with the outlet located therein and a second space between the sleeve and the housing communicating with said inlet;

porous filtering means disposed in the second space;

magnetic filtering means disposed within the first space, the magnetic filtering means comprising a base comprising a hollow shell body having an open bottom end, said open bottom end having a diameter substantially equal to the first diameter of the sleeve and a closed top end having a reduced diameter relative to said open bottom end, said base being located and secured within the first space by base securing means so that the open bottom end thereof completely encloses the outlet formed on the bottom of the housing, the base comprising first oil passage means formed on the closed top end thereof forming fluid communication to an interior space defined by the hollow shell body,

particle collection means fixed to the top end of the base member, the particle collection means comprising an upper member which is formed by a plate material having a central recess with a circumferential flange connected to and surrounding an outer circumference thereof and a lower member which is formed by a plate material having a central recess with a circumferential flange connected to and surrounding an outer circumference thereof, the recess of each of the upper and lower member comprising a substantially flat bottom and a surrounding side wall to which the circumferential flange is connected, each said flat bottom having a plurality of slots formed thereon, the upper member and lower member being so arranged that the recesses face away from one another, with the bottoms of the recesses in contact engagement with each other to define a ring space adjacent the radially outer surfaces of the sidewalls and between the circumferential flanges, the upper member being located away from the base and the lower member being located to be facing but spaced from the top end of the base to define a lower oil path therebetween, the upper member having a plurality of particle collection slots formed on a side of its circumferential flange opposite the ring space and the lower member having a plurality of particle collection slots formed on a side of its circumferential flange opposite the ring space, the slots formed on the bottom of the recess of each of the upper and lower members being aligned so as to define second oil passage means,

magnet means arranged to have a ring shape to be received and held in the ring space of the particle collection means, the magnet means having magnetic poles located in the close proximity of the particle collection slots formed on circumferential flanges of the upper and lower particle collection members,

a top member which is fixed on the upper member in a spaced manner to define an upper oil path therebetween which conducts oil carrying ferrous metal particles to flow through the particle collection slots of the upper particle collection member, which oil flow is further conducted to pass through the second oil passage means so as to enter an interior space of the base via the first oil passage means,

the lower oil path conducting a portion of the oil carrying the ferrous metal particles to flow through the particle collection slots formed on the lower particle collection member and then joining the oil flow through the upper oil path and the second oil passage to enter the interior space of the base via the first oil passage means.

5,462,663

SUSPENSION AND GUIDANCE MECHANISM FOR THE FILTER PLATES OF A FILTER PRESS

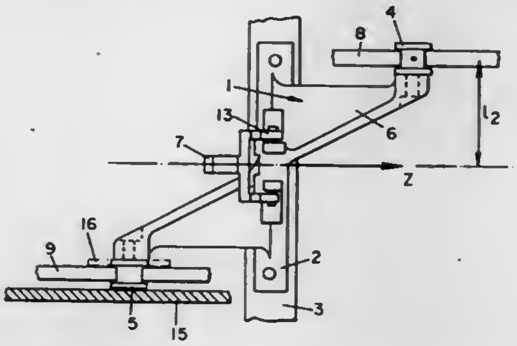
Jürgen Fresenius, Bad Schwalbach, and Fritz Gebhardt, Runkel, both of, Germany, assignors to Passavant-Werke AG, Germany

Filed Nov. 18, 1993, Ser. No. 154,003

Claims priority, application Germany, Nov. 19, 1992, 42 39 005.2

Int. Cl.^{6} B01D *25/172*

U.S. Cl. 210—230 **3 Claims**



1. A filter press comprising:

first and second parallel rails;

a carrying section piece for supporting said first and second parallel rails such that there is a longitudinal space therebetween;

a transport device positioned above and intermediate said first and second parallel rails, said transport device having at least one transport catch and means for moving the transport catch in a first direction longitudinally of said rails;

a plurality of dollies extending between said first and second parallel rails in said longitudinal space, each of said dollies having first and second rollers running on an upper surface of said first and second rails, respectively;

said first and second rollers being staggered longitudinally of said rails such that the first roller is a leading roller and the second roller is a trailing roller with respect to said first direction, wherein said rollers each have a free axially outer surface facing laterally and outwardly away from said rails;

a plurality of filter plates, each of said filter plates being rigidly suspended below said rails from a respective dolly;

an engagement element positioned on each of said dollies between said first and second roller for engagement by said transport catch, whereby a transport movement of the dollies in said first direction is effected, said trailing roller having freedom for upward vertical motion away from the second rail in response to forces acting on the filter plate carried by said dolly during said transport movement; and

a guide bar having a guide surface extending parallel to said second rail and positioned proximate the free axially outer surface of said trailing roller, said guide surface and having a sufficient height for contacting the free axially outer surface of said trailing roller to prevent said trailing roller from lateral movement outwardly away from the second rail during said upward vertical motion.

5,462,664

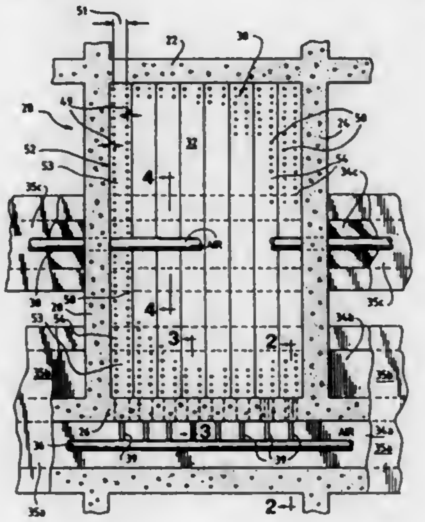
FILTER UNDERDRAIN MODULE AND UNDERDRAIN SYSTEM

Peter J. Neuspiel, 833 Surrey La., Media, Pa. 19063

Continuation-in-part of Ser. No. 926,527, Aug. 5, 1992, abandoned. This application Jul. 11, 1994, Ser. No. 274,206

Int. Cl.^{6} B01D *24/46*

U.S. Cl. 210—274 **38 Claims**



1. A filter underdrain module for use in an underdrain system that is positioned below a filter bed which has at least one layer of granular filter media that removes particulate matter and other contaminants from a liquid that passes through the filter, and requires periodic cleaning by backwashing with water and scouring with air, which filter underdrain module comprises:

(a) an elongated, integrally constructed, self-contained unit having an enclosed interior and having a substantially flat, substantially rectangular exterior top wall,

said flat top wall of the module defining two separate sets of discharge openings, one set for water and the other set for air, through which streams of washing water and streams of scouring air, respectively, can pass separately from said enclosed interior at the same time without any mixing of the two fluids,

all said discharge openings being located in said flat top wall between the exterior side walls of the module and spaced therefrom,

the exterior walls of the module further defining a first inlet opening for introducing water under pressure at a first rate of flow into the enclosed interior of the module, and a second inlet opening, which is completely separate from said first inlet opening, for introducing air under pressure at a second rate of flow into the enclosed interior of the module; and

(b) two separate, enclosed conduits located within, and integrally constructed with, the underdrain module, one conduit solely for water and one solely for air, said separate, enclosed conduits being operatively connected from the inlet openings for water and for air to the respective sets of discharge openings for water and for air, to convey water and air Separately from said inlet openings for water and air to the respective separate sets of discharge openings for water and for air,

whereby no intermixing of water and air can occur within the underdrain module itself during cleaning of the filter media by backwashing with water and scouring with air, whether the washing and scouring are done sequentially or simultaneously, and

since the streams of water and streams of air exit separately out of their respective separate sets of discharge openings in the top wall of the module, even in simultaneous washing and scouring the intermixing of streams of water and streams of air outside the module before both streams have come into contact with the filter media is minimized or entirely avoided.

5,462,665

HYDROPHOBIC YARN FILTER FABRIC FOR A CONCRETE PRESS MOULD

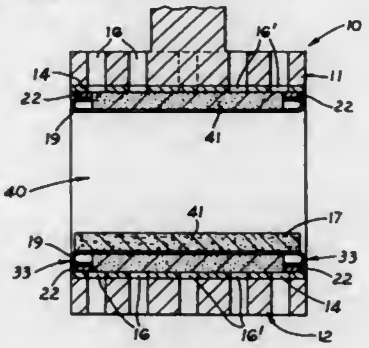
Barrie E. Green, 21 Green Leas, Aston-on-Trent Derby, DE7 2UQ, United Kingdom

Filed Nov. 30, 1993, Ser. No. 159,814

Claims priority, application United Kingdom, May 1, 1993, 9309066; Nov. 1, 1993, 9322488

Int. Cl.^{6} B01D *25/176;39/10*

U.S. Cl. 210—496 **16 Claims**



1. A filter fabric for use in a concrete press mould containing a cementitious mixture, the fabric being knit, at least in part, from a hydrophobic yarn and having a fabric porosity which permits the passage of water therethrough but prohibits the passage of particulate material, the fabric being warp knitted so as to provide a two-bar knitted ground construction which provides integrity for the fabric and a plurality of surface yarns secured in the ground construction so as to define at least one face of the fabric adapted to contact the cementitious mixture, the yarn counts for both bars collectively ranging between 350–650 dtex, said surface yarns being arranged to define closely spaced side by side floats lying flat against the ground construction to collectively define a substantially continuous flat surface for said face.

5,462,666

TREATMENT OF NUTRIENT-RICH WATER

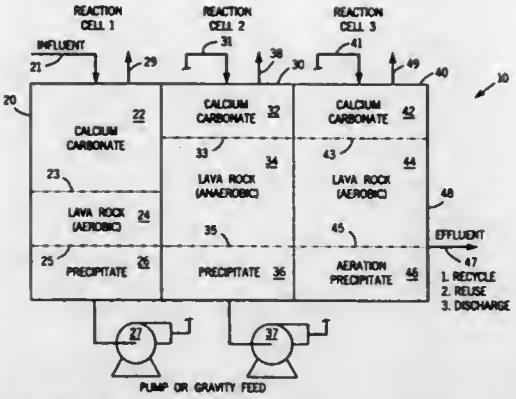
Ronald C. Kimmel, Belle Glade, Fla., assignor to RJJB & G, Inc., West Palm Beach, Fla.

Filed Sep. 28, 1994, Ser. No. 314,605

Int. Cl.^{6} C02F *3/06;3/30*

U.S. Cl. 210—602 **24 Claims**

1. A method of treating nutrient-rich water containing nitrogen compounds, phosphorous compounds, and other minerals comprising the following steps:



(a) feeding the nutrient-rich water to at least one first reaction vessel having a first zone containing a substantially insoluble basic salt and a second zone containing aerobic microorganisms retained on an inert substrate;

(b) controlling the rate of flow of the water to carry out in the first reaction vessel the reactions of:

(1) maintaining the pH of the water in the first zone for precipitating at least a portion of the phosphorous compounds and other minerals, and

(2) biologically oxidizing in the second zone under aerobic conditions at least a portion of the nitrogen compounds to nitrites and nitrates;

(c) separating the precipitated phosphorous and minerals from the water;

(d) feeding the separated water from the first vessel to at least one second reaction vessel having a first zone containing a substantially insoluble basic salt and a second zone containing anaerobic microorganisms retained on an inert substrate;

(e) controlling the rate of flow of the water to carry out in the second reaction vessel the reactions of:

(1) maintaining the pH of the water in the first zone for precipitating at least a portion of the phosphorous compounds and other minerals, and

(2) biologically reducing in the second zone under anaerobic conditions at least a portion of the nitrites and nitrates to nitrogenous gas;

(f) separating the precipitated phosphorous and minerals from the water;

(g) feeding the separated water from the second vessel to at least one third reaction vessel having a first zone containing a substantially insoluble basic salt and a second zone containing aerobic microorganisms retained on an inert substrate;

(h) aerating the third reaction vessel;

(i) controlling the rate of flow of the water to carry out in the third reaction vessel the reactions of:

(1) maintaining the pH of the water in the first zone for precipitating at least a portion of the phosphorous compounds and other minerals, and

(2) biologically oxidizing in the second zone at least a portion of unoxidized nitrogen compounds to nitrates;

(j) separating the precipitated phosphorous and minerals from the water; and

(k) removing the separated water from the third reaction vessel.

5,462,667

FILTER FOR LIQUOR FILTRATION

Kurt H. Wollinsky, Illerkirchberg, and Michael W. K. Saefkow, Langen, both of, Germany, assignors to Pall Corporation, East Hills, N.Y.

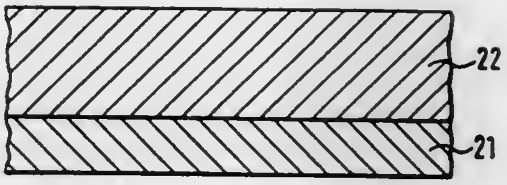
Continuation of Ser. No. 30,375, Apr. 29, 1993, abandoned. This application Sep. 27, 1994, Ser. No. 313,535

Claims priority, application European Pat. Off., Jan. 5, 1990, 90119187

Int. Cl.^{6} B01D *61/00;29/00*

U.S. Cl. 210—645 **39 Claims**

24. A method for the filtration of liquor cerebrospinalis comprising passing liquor cerebrospinalis through a filter comprising a



membrane layer having a pore size of 0.04 to 0.45 μm and a layer thickness of from 0.1 to 1 mm, wherein said filter has a geometric surface area of from 50 to 300 cm^2, a pyrogen separation capacity of at least 500 μg, and a pore volume from 50 to 90%.

5,462,668

USE OF STEAM TO CONDENSATE TO DILUTE BRINE STREAM ADDITIVES

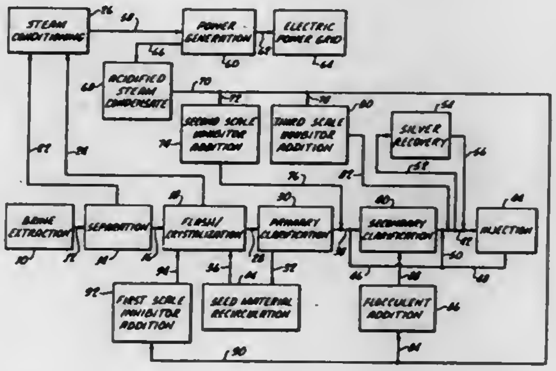
Darrell L. Gallup, Chino; John L. Featherstone, El Centro, and Carl E. Flint, Yorba Linda, all of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Continuation-in-part of Ser. No. 717,527, Jun. 19, 1991, Pat. No. 5,268,108, and Ser. No. 861,323, Mar. 31, 1992, Pat. No. 5,288,411, which is a continuation-in-part of Ser. No. 717,527, Jun. 19, 1991. This application Sep. 30, 1993, Ser. No. 130,112

Int. Cl.^{6} C02F *1/56;5/10*

U.S. Cl. 210—696 **7 Claims**

1. A method for combining a pH adjusted steam condensate with



an additive for adding to a geothermal brine stream containing dissolved components including naturally occurring radioactive materials and silicon-containing components, said method comprising:

a) recovering a portion of a liquid steam condensate stream from a geothermal brine extracted from the earth after power generation;

b) pH adjusting the condensate stream portion to within a range of about 4 to 6 pH units;

c) combining at least one additive to be added to the geothermal stream with the pH adjusted steam condensate to form a diluted additive, wherein said additive comprises a crystal structure modifier or a flocculent; and

d) adding the additive to the brine stream to produce a concentration of less than about 50 ppm by weight of additive in the brine stream wherein said combining and adding steps: i) prevent substantial thermal decomposition of said additive when said diluted additive is added to the brine stream and ii) reduce precipitation of one or more of said dissolved component from the brine stream or accelerate precipitation of said silicon-containing components from the brine stream.

5,462,669

METHOD FOR DISSOLVED AIR FLOATATION AND SIMILAR GAS-LIQUID CONTACTING OPERATIONS

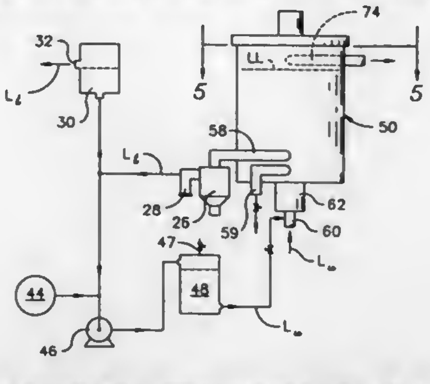
George C. Yeh, 2x Smedley Dr., Newtown Square, Pa. 19073

Division of Ser. No. 36,665, Mar. 24, 1993, Pat. No. 5,382,358. This application Jul. 27, 1994, Ser. No. 281,507

Int. Cl.^{6} C02F *1/24*

U.S. Cl. 210—703 **22 Claims**

1. In an upright tank having at least one partition therein defining an involute flow channel extending from near the bottom of the tank to an elevation below the top of the tank with a free-standing inner end terminating near the center of the tank, and inlet and outlet ports communicating at either end of the flow channel near the bottom thereof, a method of clarification by separating suspended matter from unclarified liquid with dissolved gas floatation, comprising the steps of:



mixing the unclarified liquid with a clarified liquid containing a dissolved gas to form a mixture;

introducing said mixture through the inlet port into the involute flow channel;

separating said suspended matter from said mixture by microbubbles of the gas released from the mixture producing thereby said clarified liquid;

simultaneously discharging said clarified liquid at the outlet port and removing said separated matter from the surface of said mixture;

dissolving the gas in a discharged portion of said clarified liquid for mixing with the unclarified liquid; and

maintaining a flow rate of said mixture through the tank at a level near the top of the partition with a residence time T_f of the mixture in the flow channel at least equal to a residence time T_b of the microbubbles in the mixture.

5,462,670

PROCESS FOR REMOVING OILS AND GREASES FROM AQUEOUS SOLUTION

Robert G. Guess, Beverly, Mass., assignor to Romar Technologies, Inc., Beverly, Mass.

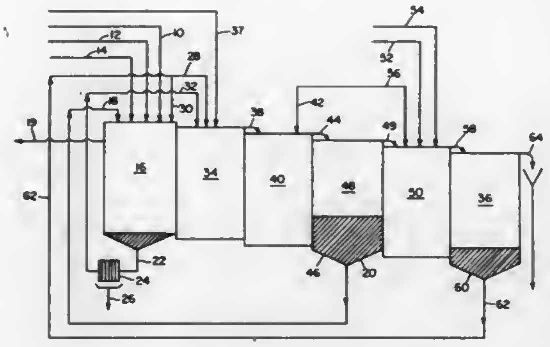
Continuation-in-part of Ser. No. 160,240, Dec. 2, 1993, abandoned, which is a division of Ser. No. 893,978, Jun. 3, 1992, Pat. No. 5,298,168, which is a continuation-in-part of Ser. No. 682,129, Apr. 8, 1991, Pat. No. 5,122,279. This application Mar. 28, 1994, Ser. No. 218,891

Int. Cl.^{6} C02F *1/62;1/70*

U.S. Cl. 210—713 **39 Claims**

1. The process for removing a first composition selected from the group consisting of an oil, a grease, and mixtures thereof from an aqueous composition which contains said first composition which comprises;

(a) in a first reaction step, admixing said aqueous composition with an acidic aqueous solution containing ferrous ion, sulfite and/or bisulfite ion and dithionite ion at a pH between about 1 and 7 to form a first liquid effluent (b) in a second reaction step, admixing and reacting said first liquid effluent with a water soluble alkali composition to effect a pH of between about 6 and 12 and to produce a metal hydroxide precipitate containing oil and/or grease, (c) separating said metal hydroxide precipitate from a second liquid effluent, (d) mixing said metal hydroxide precipitate containing said oil and/or grease with an acid at a pH between about 1 and 4 to effect dissolving of said metal hydroxide precipitate and separation of oil and/or grease and to form an acidic solution containing ferrous ion, (e) recovering said oil and/or grease, (f) in a third reaction step adding a source of ferrous ion, sulfite or bisulfite ion and dithionite ion to said acidic aqueous solution to form a third liquid effluent, and (g) cycling said third liquid effluent to said first reaction step.



5,462,671

METHOD OF REMOVING HEAVY METALS FROM SOLUTIONS OF AMINO-CARBOXYLIC ACIDS FOR DISPOSAL PURPOSES

Stephen T. Arrington, and Gary W. Bradley, both of Duncan, Okla., assignors to HydroChem Industrial Services, Inc., Houston, Tex.

Filed Sep. 8, 1994, Ser. No. 303,250

Int. Cl.^{6} C02F *1/62*

U.S. Cl. 210—717 **20 Claims**

1. A method for removing dissolved metals from an aqueous solution containing said metals complexed with amino-carboxylic acid chelates, said method comprising:

(a) contacting the aqueous solution with sufficient nitrous acid for a time sufficient to uncomplex said metals; and

(b) adding a strong base to the aqueous solution to precipitate the uncomplexed metals from solution.

5,462,672

PROCESS FOR TREATING SLUDGE AND SYSTEM FOR THE SAME

Masahiro Iji, Chiba; Masami Yoda, Kanagawa; Shin Suzuki, Tokyo; Kaoru Ishizuka; Sotoo Kubo, Tokyo; Isao Yamaki, Tokyo, and Toshikuni Hashimoto, Saitama, all of, Japan, assignors to Chemical Grouting Co., Ltd.; Front Engineering Co. Ltd.; Kurita Water Industries Ltd., and Shoesangyo Corporation, all of Tokyo, Japan

Filed Aug. 12, 1993, Ser. No. 104,850

Claims priority, application Japan, Aug. 13, 1992, 4-215907

Int. Cl.^{6} C02F *1/56;11/14*

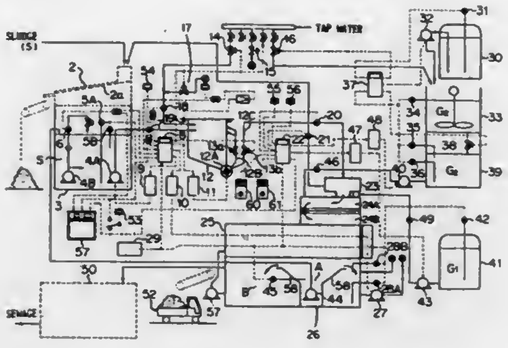
U.S. Cl. 210—727 **11 Claims**

1. A process for treating sludge, comprising the steps of:

diluting sludge which is generated from a ground improvement working site with an amount of water based upon the measured specific gravity of said sludge so that a specific gravity of the diluted sludge falls in the range of 1.15 to 1.35;

flocculating the diluted sludge by adding a flocculating agent thereto; and

dehydrating the flocculated sludge by mechanical dehydrating means in which a filter fabric is used.



5,462,673

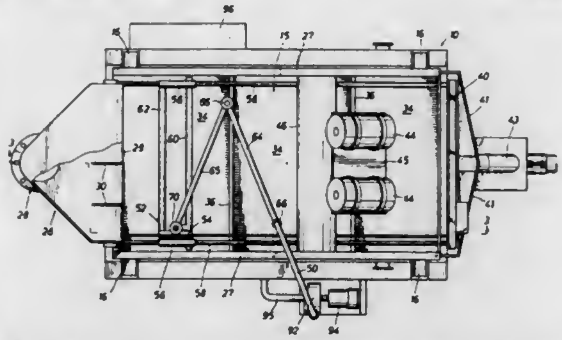
CLEANING SYSTEM FOR VIBRATORY SCREENING DEVICES

George E. Piers, Houston, Tex., assignor to Triton Engineering Services Company, Houston, Tex.

Filed Dec. 15, 1993, Ser. No. 167,246

Int. Cl.^{6} B01D *35/143;33/48*

U.S. Cl. 210—739 **29 Claims**



18. A method for cleaning at predetermined intervals a planar vibratory mesh screen of a separation device in which fluid entrained solids are moving along the vibrating mesh screen, said method comprising the following steps:

providing a supply of water for cleaning said vibratory mesh screen;

providing water discharge means above said screen;

discharging water from said water discharge means downwardly in a stream against said vibratory mesh screen at said predetermined intervals;

moving said water discharge means in a plane parallel to said mesh screen to maintain said stream at a uniform distance from said mesh stream during travel thereof over said screen;

supplying water to said water discharge means at predetermined intervals during operation of said separation device;

providing means for sensing the flow rate of water through said vibratory mesh screen and providing an output signal upon the flow rate decreasing a predetermined amount; and

providing means responsive to said output signal for actuating said water discharge means for discharging water against said vibratory mesh screen to clean said mesh screen during operation of said separation device.

5,462,674

METHOD AND SYSTEM FOR PHOTOCATALYTIC DECONTAMINATION

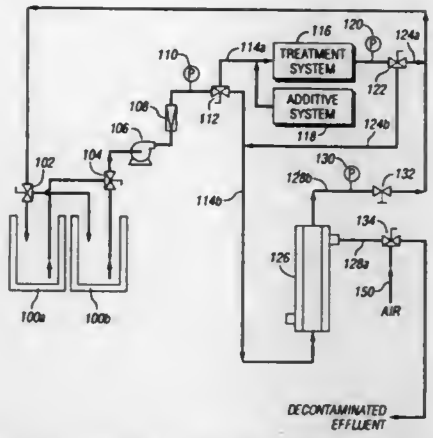
Brian E. Butters, St. Thomas, and Anthony L. Powell, London, both of, Canada, assignors to Purific Environmental Technologies, Inc., Canada

Filed Mar. 3, 1994, Ser. No. 205,699

Int. Cl.^{6} C02F *1/48;1/32;* **B01D** *63/06;65/02*

U.S. Cl. 210—748 **21 Claims**

1. A method for purifying a contaminated fluid, comprising:



mixing a contaminated fluid with a photocatalyst to form a slurry;

passing the slurry through a space irradiated by ultraviolet light to bring about a photocatalytic reaction of the slurry whereby decontaminated effluents are rendered in the slurry;

segregating the decontaminated effluents from the slurry by filtration through a plurality of ceramic filter elements;

intermittently removing any collections of photocatalyst in the plural ceramic filter elements by passing a shock wave therethrough; and

repeating the above steps with a substantially constant charge of photocatalyst.

5,462,675

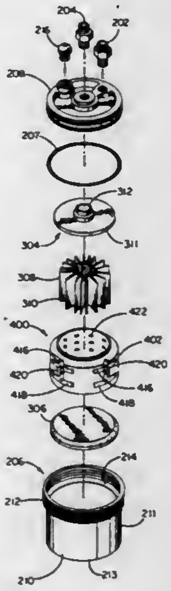
FILTER ASSEMBLY AND METHOD OF REDUCING HOLD-UP IN A FILTER ASSEMBLY

Scott D. Hopkins, Dryden, and Timothy P. Pierce, Syracuse, both of N.Y., assignors to Pall Corporation, East Hills, N.Y.

Filed Jul. 15, 1994, Ser. No. 275,871

Int. Cl.^{6} B01D *27/08*

U.S. Cl. 210—767 **98 Claims**



1. A filter assembly comprising:

(a) a housing having an inside diameter and an inlet and an outlet defining a fluid flow path therethrough;

(b) a filter element comprising a filter having a diameter less than the inside diameter of the housing, the filter being disposed within the housing in the fluid flow path; and

(c) a sleeve positioned between the housing and the filter, the sleeve including:

at least one groove for distributing fluid flow around the filter and

at least one flow aperture disposed in the groove to direct fluid flow to or from the filter.

5,462,676

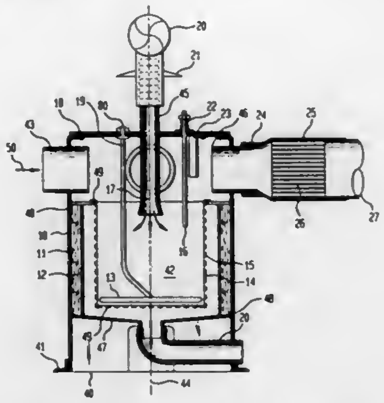
PROCESS AND SYSTEM FOR TREATING SOLID AND LIQUID WASTE

John Pitts, Brockton, Mass., assignor to Envirowaste Systems, Inc., Far Hills, N.J.

Filed Jun. 28, 1993, Ser. No. 83,629

Int. Cl.^{6} B01D *35/18*

U.S. Cl. 210—774 **43 Claims**



1. A process for treating solid waste and liquid waste in an apparatus comprising

separating said solid waste from said liquid waste within said apparatus,

passing said liquid waste out of said apparatus while retaining said solid waste within said apparatus,

converting said solid waste to ash within said apparatus,

introducing an additional liquid waste into said apparatus, and

combining said liquid waste with said ash and passing said additional liquid waste and said ash out of said apparatus.

5,462,677

FILTER APPARATUS BELT FILTER MEDIUM CONTROL AND TREATMENT

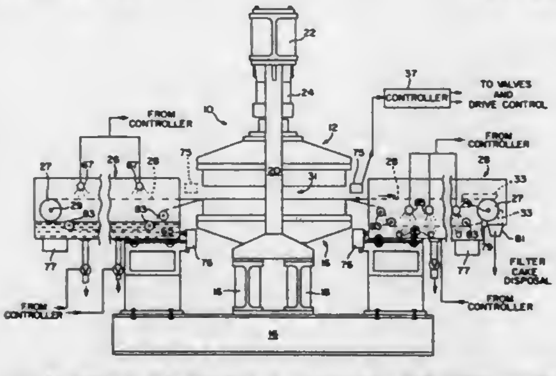
Steve C. Benesi, 611 McClay Rd., Novato, Calif. 94947

Continuation-in-part of Ser. No. 864,524, Apr. 7, 1992, Pat. No. 5,292,434. This application Dec. 13, 1993, Ser. No. 167,559

The portion of the term of this patent subsequent to Mar. 8, 2011, has been disclaimed.

Int. Cl.^{6} B01D *25/12;37/00;24/46*

U.S. Cl. 210—791 **20 Claims**



17. A method for treating a continuous belt filter medium mounted on a filter apparatus having a filter chamber, belt treating means outside of said filter chamber and means for moving said belt filter medium sequentially through said filter chamber and said belt treating means, comprising the steps of:

a) positioning a first portion of said belt filter medium within said filter chamber for a filtering operation adapted to separate a slurry having solids and liquids and for retaining said slurry solids on said belt filter medium,

b) positioning said first portion of said belt filter medium within said belt treating means,

c) cleaning said first portion of said belt filter medium in said treating means to remove said slurry solids from said belt,

d) applying materials to said first portion of said belt filter medium in preparation for reentry of first portion of said belt filter medium into said filter chamber,

e) and sequentially repeating the above steps a), b), c) and d) on sequential portions of said continuous belt filter medium.

5,462,678

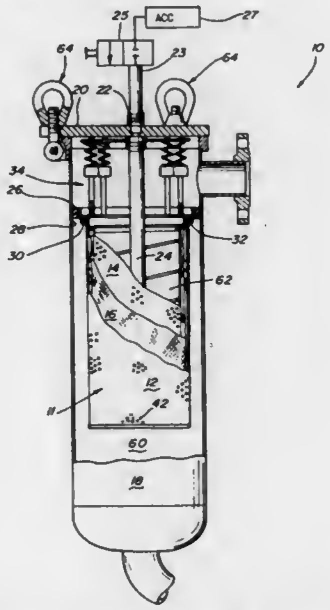
AIR BLAST BACKWASH ASSEMBLY FOR FLEXIBLE FILTER DEVICE

Borje O. Rosaen, Ann Arbor, Mich., assignor to Rosedale Products, Inc., Ann Arbor, Mich.

Filed Jan. 6, 1993, Ser. No. 1,080

Int. Cl.^{6} B01D *29/66*

U.S. Cl. 210—798 **10 Claims**



3. A method of backwashing a filter device, said filter device having an inner and an outer basket with a flexible filtering element retained between said baskets, said filter element being located in a housing to define an outlet chamber for a clean liquid inside of said inner basket, and an inlet chamber between said housing and said outer basket, said method comprising the following steps:

a) introducing liquid to be filtered into said inlet chamber;

b) passing said liquid through said outer basket, said filtering element, and said inner basket into said outlet chamber;

c) delivering filtered liquid from said outlet chamber out of said housing; and

d) interrupting the filtering sequence of steps a, b and c then causing a blast of pressurized air to enter said outlet chamber and passing said pressurized air and the filtered clean liquid to flow in a reverse direction through said inner basket, said filtering element, said outer basket into and through said inlet chamber to flush accumulated filter cake from said filtering element and said outer basket and out of said housing to be disposed of, said pressurized air continuing to pass through said inner basket, said filtering element and said outer basket for a predetermined time period after the reverse flow of fluid is expelled from the housing.

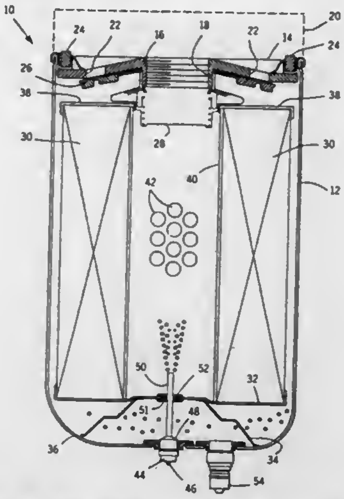
5,462,679

APPARATUS AND METHOD FOR IN SITU CLEANING OF OIL FILTER

Barry M. Verdegan, Stoughton; Christopher E. Holm; Stephen L. Fallon, both of Madison, and Brian W. Schwandt, Fort Atkinson, all of Wis., assignors to Nelson Industries, Inc., Stoughton, Wis.

Filed Sep. 16, 1993, Ser. No. 122,382
Int. Cl.^{6} B01D *29/66*

U.S. Cl. 210—798 **10 Claims**



1. A reusable oil filter adapted to filter oil used in an apparatus, said filter comprising:

a housing for connection to the apparatus, said housing having a top end portion and a bottom end portion, said housing further having an oil inlet at said top end portion for receiving oil to be filtered and an oil outlet at said top end portion for discharging filtered oil to the apparatus;

tubular filter media disposed within said housing, said tubular filter media having a radially outer inlet side fluidly connected to said inlet and an interior outlet side defining a void space, said void space being fluidly connected to said outlet, said filter media retaining portions of contaminated oil;

a singular normally closed backwashing inlet connected on said bottom end portion of housing for introducing pressurized gas below a surface of the filtered oil through said filter media, said backwashing inlet having a restrictive channel means protecting upwardly therefrom, displaced centrally with respect to the bottom of said housing and extending medially of said filter media into said void space for solely controlling said pressurized gas flow into said filter media to prevent damage thereto; and

an oil drain located adjacent said inlet side and connected with said bottom end portion of said housing for draining contaminated oil from said housing;

whereby said pressurized gas introduced below the surface of the filtered oil forces filtered oil to backflow through said filter media displacing the contaminated oil from said filter media, and creates a gas-oil foam for further cleaning said filter media while said housing remains connected to the apparatus.

5,462,680

FREE RADICAL ADDUCTS OF FULLERENES WITH HYDROCARBONS AND POLYMERS

Stanley J. Brois; Abhimanyu O. Patil, both of Westfield; Wolfgang W. Schulz, Lebanon; Chang S. Hsu, Bridgewater, and Richard T. Garner, Berkeley Heights, all of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Apr. 19, 1994, Ser. No. 229,510
Int. Cl.^{6} C10M *127/00*

U.S. Cl. 252—9 **10 Claims**

1. A composition comprising a free radical adduct of a fullerene and one to about 14 mole of a hydrocarbon selected from the group consisting of substituted and unsubstituted hydrocarbons having alkane saturations, said hydrocarbon having a number average molecular weight of about to about 10 million.

5,462,681

PARTICULATE SUSPENDING ANTIMICROBIAL ADDITIVES

Timothy A. Gutzmann, Eagan, and Mark R. Altier, St. Paul, both of Minn., assignors to Ecolab, Inc., St. Paul, Minn.

Filed Nov. 12, 1993, Ser. No. 150,951
Int. Cl.^{6} C10M *129/08;173/02*

U.S. Cl. 252—11 **16 Claims**

1. A method for suspending particulate matter and sanitizing the area of contact comprising the steps of:

(a) diluting a particulate suspending antimicrobial concentrate composition with a diluent, said concentrate composition comprising a carrier comprising a conveyor lubricant, an antimicrobial effective amount of a quaternary ammonium cationic compound, and an effective soil suspending amount of an amphoteric surfactant; and

(b) applying the diluted concentrate composition to the intended area of application.

5,462,682

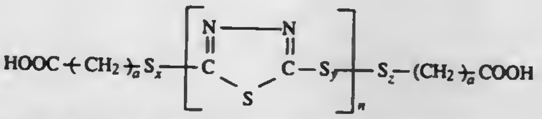
COLLOIDAL PRODUCTS CONTAINING CALCIUM AND/OR MAGNESIUM, AS WELL AS SULFUR AND NITROGEN, THEIR PREPARATION AND THEIR USE PARTICULARLY AS ADDITIVES IN LUBRICATING OILS

Bruno Delfort, Paris; Bertrand Daqudal, Pontigny; Jacques Lallement, Aubervilliers; Maurice Born, Nanterre; Pierre Marchand, Orgeval, and Jean-Claude Hipeaux, Colombes, all of, France, assignors to Institut Francais Du Petrole, Rueil Malmaison, France

Filed Aug. 18, 1994, Ser. No. 292,004
Claims priority, application France, Aug. 18, 1993, 93 10128
Int. Cl.^{6} C10M *135/36;137/00*

U.S. Cl. 252—18 **17 Claims**

1. A colloidal product containing sulfur, nitrogen and at least one of calcium or magnesium, obtained by at least partial neutralization of the basicity reserve of at least one of an overbasic sulfonate, phenate or salicylate having at least one of calcium or magnesium carbonate dispersed within micelles therein, said neutralization being by at least one dicarboxylic acid of formula I:



(I)

wherein a is each independently, a whole number from 1 to 8, x and z are each independently a number from 1 to 4, y is a whole number from 0 to 4 and n is 1 or 2.

5,462,683

GREASE COMPOSITION FOR CONSTANT VELOCITY JOINT

Hirotugu Kinoshita, Kanagawa; Souichi Nomura, Tokyo, and Masaru Mishima, Kanagawa, all of, Japan, assignors to Nippon Oil Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 115,457, Sep. 1, 1993, which is a continuation of Ser. No. 846,357, Mar. 5, 1992, abandoned. This application Oct. 12, 1993, Ser. No. 135,254

Claims priority, application Japan, Mar. 7, 1991, 3-042081; European Pat. Off., Mar. 6, 1992, 92103878

Int. Cl.^{6} C10M *125/26;123/02*

U.S. Cl. 252—25 **23 Claims**

1. A grease composition for a constant velocity joint comprising a base oil containing (A) 2 to 25 wt. % of a thickener based on total weight of the composition, (B) 0.5 to 20 wt.% of boron nitride powders based on total weight of the composition, said boron nitride powders having mean particle size of 0.4 μm to 5 μm and (C) 0.1 to 10 wt.% of an extreme pressure agent based on total weight of the composition selected from the group consisting of molybdenum dithiocarbamate, a sulfur and phosphorus-containing extreme pressure agent, and mixtures thereof, said sulfur and phosphorus-containing extreme pressure agent consisting of a sulfur-containing compound and a phosphorus-containing compound, said sulfur-containing compound being selected from the group consisting of a sulfide of fats and oils, a polysulfide, and mixtures thereof, and said phosphorus-containing compound being selected from the group consisting of a phosphate, a phosphite, and mixtures thereof.

5,462,684

GREASE COMPOSITION CONTAINING ALKYL DIPHENYL ETHER OIL AND DIUREA THICKENER

Michiharu Naka, Odawara; Hideki Koizumi, Chigasaki; Yuzo Takahashi, Fujisawa; Hirotugu Kinoshita, Yokohama, and Masaru Mishima, Kawasaki, all of, Japan, assignors to Nippon Oil Co., Ltd., and NSK Ltd., both of Tokyo, Japan

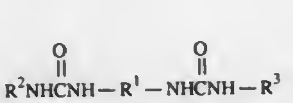
Filed Jun. 23, 1993, Ser. No. 81,810

Claims priority, application Japan, Jun. 29, 1992, 4-171025

Int. Cl.^{6} C10M *115/08*

U.S. Cl. 252—51.5 R **11 Claims**

1. A grease composition for a high-speed rolling bearing comprising an alkyl diphenyl ether oil as a base oil, and a diurea compound or mixture of diurea compounds, represented by the formula (1)



$$R^2NH\overset{\overset{\displaystyle O}{\|}}{C}NH-R^1-NH\overset{\overset{\displaystyle O}{\|}}{C}NH-R^3 \qquad (1)$$

wherein R^1 denotes a divalent aromatic hydrocarbon residue having 6 to 15 carbon atoms and R^2 and R^3 may be the same or different and each represent a cyclohexyl group, a cyclohexyl derivative group having 7 to 12 carbon atoms or an alkyl group having 8 to 20 carbon atoms, said diurea compound being contained as a thickener in said base oil, a content in percent of said cyclohexyl group and said cyclohexyl derivative group in said diurea compound or mixture of diurea compounds being such that a value of [{(numbers of cyclohexyl groups and derivative groups thereof)/(numbers of cyclohexyl groups and derivative groups thereof plus numbers of alkyl groups)}×100] is equal to 50 to 100%, said diurea compound being contained in an amount of 16 to 30 wt. % based on a total weight of the composition.

5,462,685

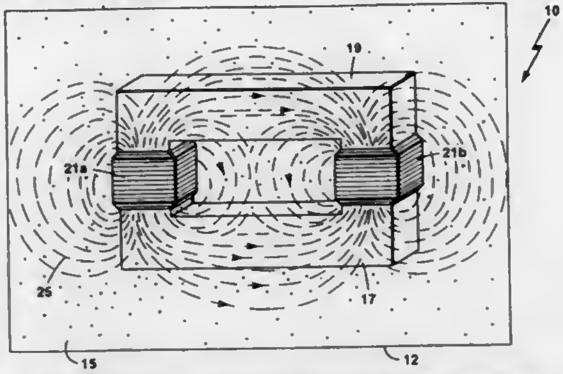
FERROFLUID-COOLED ELECTROMAGNETIC DEVICE AND IMPROVED COOLING METHOD

Kuldip Raj, Merrimac, and Ronald Moskowitz, Hollis, both of N.H., assignors to Ferrofluidics Corporation, Nashua, N.H.

Filed Dec. 14, 1993, Ser. No. 166,688

Int. Cl.^{6} H01F *1/44;* **H05K** *5/00*

U.S. Cl. 252—62.56 **24 Claims**



1. A convection-cooled electromagnetic device comprising:

a. a container having a wall;

b. within the container, an electromagnetic device producing an external magnetic field and having a maximum operating temperature; and

c. a ferrofluid surrounding the device and in contact with the wall, the ferrofluid comprising:

   i. a substantially ion-free, thermally stable oil carrier having a dielectric constant below 4 and an intrinsic resistivity exceeding 10^7 ohm-meters; and

   ii. dispersed therein, a sufficient concentration of magnetic particles to produce a bulk ferrofluid saturation magnetization of at least 50 Gauss, the particles exhibiting a Curie temperature of no more than 300° C.

5,462,686

METHOD OF MANUFACTURING COMPOSITE FERRITE

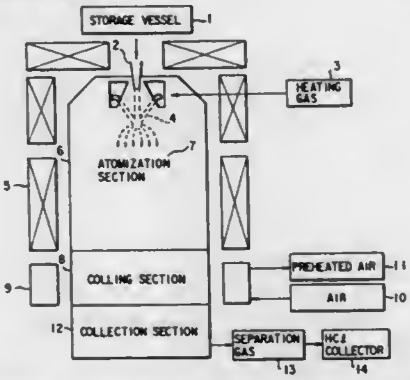
Shunichi Sugiyama; Hiroshi Kametani, both of Yokohama; Hideyuki Yoshikoshi, Hino; Nobuaki Ikeda, and Tomihiro Hara, both of Yokohama, all of, Japan, assignors to NKK Corporation; Kokan Mining Co., Ltd., and Irox-NKK Co., Ltd., all of Tokyo, Japan

Continuation of Ser. No. 32,965, Mar. 18, 1993, abandoned. This application Jul. 29, 1994, Ser. No. 283,207

Claims priority, application Japan, Mar. 23, 1992, 4-065143; Feb. 19, 1993, 5-030759

Int. Cl.^{6} C04B *35/30;35/34*

U.S. Cl. 252—62.62 **14 Claims**



1. A method of manufacturing a composite ferrite comprising oxides of two or more metals, one of said metals being zinc, prepared from a chloride solution containing ions of said metals, the method comprising the steps of:

(a) allowing the solution to flow down in a reaction vessel or injecting the solution into the reaction vessel; and

(b) injecting a high-temperature gas containing oxygen into said solution, said high-temperature gas being at a speed which is faster than a speed of flowing down drops of the solution or an injecting speed of the solution, said high-temperature gas containing 1 to 21 volume % of oxygen gas, and being at a temperature of 800° C. or higher, to atomize said solution into mist particles, and to evaporate moisture from each mist particle of said solution in such a short period of time that zinc chloride in the solution is not substantially evaporated, and to induce heat decomposition or chemical reaction of remaining metal salt particles, thereby forming composite ferrite particles, the composite ferrite having substantially the same composition ratio as that of said chloride solution.

5,462,687

ELECTROVISCOUS FLUID BASED ON POLYETHER ACRYLATES AS DISPERSE PHASE

Wolfgang Podszun; Robert Bloodworth, both of Köln, and Günter Oppermann, Leverkusen, all of, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

PCT No. PCT/EP92/01235, § 371 Date Dec. 7, 1993, § 102(e) Date Dec. 7, 1993, PCT Pub. No. WO92/22623, PCT Pub. Date Dec. 23, 1992

PCT Filed Jun. 4, 1992, Ser. No. 162,060

Claims priority, application Germany, Jun. 14, 1991, 41 19 670.8

Int. Cl.^{6} C10M *171/00;169/04*

U.S. Cl. 252—79 **12 Claims**

1. In a stable electroviscous fluid comprising a dispersion medium, a particulate polymer therein and at least one dispersant wherein said dispersant is polysiloxane-based and contains acrylate or (meth)acrylate groups or is a styrene/butadiene copolymer which is present in an amount sufficient to disperse said particulate polymer, the improvement wherein:

said fluid comprises a non-aqueous liquid, and

said particulate polymer contains polyether ether and (meth) acrylate units.

5,462,688

FLOWABLE, PUMPABLE CLEANING COMPOSITIONS AND METHOD FOR THE PREPARATION THEREOF

Jerome Lippman; Michael J. Dolan; John J. Sullivan, Jr., and John H. Viscovitz, all of Akron, Ohio, assignors to GOJO Industries, Inc., Guyahoga Falls, Ohio

Filed Aug. 20, 1993, Ser. No. 109,427

Int. Cl.^{6} C11D *9/22*

U.S. Cl. 252—89.1 **28 Claims**

1. A cleaning composition comprising:

an oil phase including at least one of a hydrocarbon oil and a hydrocarbon solvent and mixtures thereof, and at least one of a fatty acid and a non-fatty acid soap surfactant;

a water phase containing water and a base; and

an effective amount of psyllium husks to make the composition flowable.

5,462,689

COMPOSITION AND METHOD FOR DEVELOPING EXTENSIONAL VISCOSITY IN CLEANING COMPOSITIONS

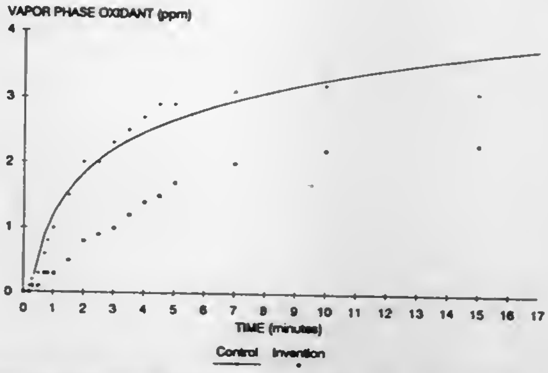
Clement K. Choy, Alamo, and Paul F. Reboa, Dublin, both of Calif., assignors to The Clorox Company, Oakland, Calif.

Continuation of Ser. No. 963,144, Oct. 19, 1992, abandoned.

This application Oct. 17, 1994, Ser. No. 324,316

Int. Cl.^{6} C11D *1/75;3/395;17/04;17/08*

U.S. Cl. 252—90 **16 Claims**



1. A thickened aqueous bleach composition for use in a spray dispenser to deliver the composition onto a hard surface to be cleaned, the dispenser tending to divide the composition into particles resulting in the release of bleach odor, the composition comprising:

(a) an aqueous solution of about 0.1 to 15 weight percent of an alkali metal hypochlorite and;

(b) about 0.2–7.5 weight percent a thickening system of consisting essentially of

(i) a hexadecyl di (C_{1-2} alkyl) amine oxide component having an alkyl chain length distribution of at least 80% C_{16}; and

(ii) an organic anionic counterion selected from the group consisting of aryl or C_{2-6} alkyl sulfonates, aryl or C_{2-6} alkyl carboxylates, sulfated C_{2-6} alkyl or aryl alcohols and mixtures thereof said aryl groups being derived from benzene or naphthalene and being unsubstituted or substituted with C_{1-4} alkyl groups, C_{1-4} alkoxy groups, halogens, nitro groups or mixtures thereof and wherein

a ratio of amine oxide component to counterion is between 4:1 and 1:2, the system possesses a Trouton ratio of greater than about 50 and an initial viscosity measured at 21° C. and 5 rpm of at least about 20 cP, and the composition pH is above about 10.5.

14. A method of employing a thickened aqueous bleach composition on a hard surface to be cleaned, in steps comprising:

forming a thickened liquid bleach composition to comprise an aqueous solution of an alkali metal hypochlorite, a pH adjusting agent in an amount effective for adjusting the pH to greater than about 10.5, and a thickening component consisting essentially of

(a) a hexadecyl di (C_{1-2} alkyl) amine oxide component having an alkyl chain length distribution of at least 80% C_{16}; and

(b) an organic anionic counterion selected from the group consisting of aryl or C_{2-6} alkyl sulfonates, aryl or C_{2-6} alkyl carboxylates, sulfated C_{2-6} alkyl or aryl alcohols and mixtures thereof, said aryl groups being derived from benzene or naphthalene and being unsubstituted or substituted with C_{1-4} alkyl groups, C_{1-4} alkoxy groups, halogens, nitro groups or mixtures thereof, and wherein

a ratio of amine oxide component to counterion is between 4:1 and 1:2, the system possess a Trouton ratio of greater than about 50 at a shear rate of between 500–10,000 sec.–1 and an initial viscosity measured at 21° C. and 5 rpm of at least about 20 cP, and

directing with a spray dispenser the thickened liquid bleach composition onto the surface to be cleaned.

5,462,690

LIQUID CLEANING COMPOSITIONS

Robert Rhinesmith, Somerset, N.J., assignor to Colgate-Palmolive Co., Piscataway, N.J.

Filed Sep. 9, 1994, Ser. No. 303,243

Int. Cl.^{6} C11D *1/02;1/22;1/72;3/18*

U.S. Cl. 252—126 **5 Claims**

1. A stable microemulsion composition consisting essentially of approximately by weight:

(a) 6% to 18% of a C_{16-18} unsaturated fatty acid;

(b) 1% to 7% of a nonionic surfactant selected from the group consisting of primary aliphatic alcohol ethoxylates, secondary aliphatic alcohol ethoxylates, alkyl phenol ethoxylates, ethylene oxide propylene oxide condensates with primary alcohols and condensates of ethylene oxide with sorbitan fatty acid esters;

(c) 0.1% to 10% of a hydrotrope selected from the group consisting of sodium cumene sulfonate and sodium xylene sulfonate;

(d) 0.1% to 50% of a cosurfactant selected from the group consisting of C_{3-4} alkanols, polypropylene glycol of the formula $HO(CH_3CHCH_2O)_nH$, wherein n is a number from 2 to 18, monoalkyl ethers and esters having the formulas $R(X)_mOH$ and $R_1(X)_mOH$ wherein R is a C_1–C_6 alkyl group, R_1 is a C_2–C_4 acyl group and m is a number from 1 to 4;

(e) 1% to 14% of triethanol amine;

(f) 0.4% to 25% of an oil phase consisting of a water insoluble perfume or a C_{6-18} water insoluble paraffin or isoparaffin; and

(g) the balance being water, where said composition does not contain builder.

5,462,691

SKIN CLEANSING AGENT

Tadahiro Shimada, Yokosukashi; Sachiko Yuki, Ebina, and Tomoko Iizuka, Tokyo, all of, Japan, assignors to Shiseido Co., Ltd., Tokyo, Japan

Filed Sep. 29, 1993, Ser. No. 128,132

Claims priority, application Japan, Sep. 29, 1992, 4-282238

Int. Cl.^{6} C11D *7/26*

U.S. Cl. 252—174.15 **13 Claims**

1. An oil free skin cleansing agent comprising 1.0–80 wt % polyethylene glycol diisostearate having an added mole number of ethylene oxide of 10–18.

5,462,692

STABLE SOLID ACETYLPEROXYBORATE COMPOUNDS

Richard Roesler, Rheinbrohl; Siegfried Schelle, Puchheim; Michael Gnann, Pfaffenhofen, and Werner Zeiss, Groebenzelli, all of, Germany, assignors to Peroxid-Chemie GmbH, Hoellriegelskreuth, Germany

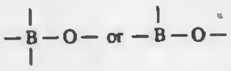
Filed Dec. 2, 1991, Ser. No. 801,001

Claims priority, application Germany, Nov. 30, 1990, 40 38 202.8

Int. Cl.^{6} C01B *15/12;15/022;* **C07F** *5/02*

U.S. Cl. 252—186.26 **41 Claims**

1. A solid acetyl peroxyborate composition having an active oxygen content of from 2 to 8% by wt. and consisting essentially of molecules of solid peracetic derivative compounds comprising acetyl groups, peracetyl groups and borate structures



$$-\overset{|}{\underset{|}{B}}-O- \text{ or } -\overset{|}{B}-O-$$

combined with each other in such a manner that the product spontaneously disintegrates in water and releases at least 10% by wt. of peracetic acid relative to the total product; said product

having an infrared spectrum characterized by IR absorption bands at approximately 1650 to 1670 cm^{-1} and at approximately 1740 to 1755 cm^{-1},

having a ^{13}C-NMR spectrum, measured by solid body spectroscopy against an external tetramethylsilane standard, characterized by a band at 18 to 19 ppm, and

upon disintegration in water, releasing no more than 4 wt. % of hydrogen peroxide relative to the total weight of the composition.

11. A process for producing a solid acetyl peroxyborate compound comprising:

a) reacting a solid boron-oxygen compound selected from the group consisting of mixtures of boric acid or boron oxide and an alkaline sodium salt, sodium polyborates containing no more than three molecules of water of hydration, sodium metaborate, borax anhydride, and sodium perborate having a Na:B molar ratio of from 0.3:1 to 1:1, with acetic acid and hydrogen peroxide; or

b) reacting a solid boron-oxygen compound selected from the group consisting of mixtures of boric acid or boron oxide and an alkaline sodium salt, sodium polyborates containing no more than three molecules of water of hydration, sodium metaborate, borax anhydride, and sodium perborate having a Na:B molar ratio of from 0.3:1 to 1:1, with a solution of peracetic acid in acetic acid; or

c) reacting acetic acid with a solid sodium perborate having a Na:B molar ratio of from 0.3:1 to 1:1,

whereby a viscous solution, a suspension or a paste is obtained; and

drying the resulting viscous solution, suspension or paste to recover the solid acetyl peroxyborate compound.

5,462,693

AIR PURIFYING AGENT AND A PROCESS FOR PRODUCING SAME

Shozo Ichimura; Seikichi Tabei, and Michinori Hashimoto, all of Tokyo, Japan, assignors to Nippon Chemical Industrial Co., Ltd., Tokyo, Japan

Filed May 25, 1993, Ser. No. 66,196

Int. Cl.^{6} B01J *20/20*

U.S. Cl. 252—190 **8 Claims**

1. An air purifying agent comprising a carrier containing short wood pulp fiber as a main component, on which one or more chemical components for purifying polluted air are supported, wherein the chemical component is selected from the group consisting of an oxidizing agent comprising an activated manganese dioxide derived from the decomposition of permanganate and iodate; an acid selected from the group consisting of phosphoric acid, acidic aluminum phosphate, and acidic iron sulfate; an alkali selected from the group consisting of alkali metal hydroxide, alkali metal carbonate and alkaline earth metal hydroxide; and an antimicrobial component selected from the group consisting of silver nitrate, alkyltrimethyl ammonium chloride, alkyldimethyl ammonium chloride, vinylbenzyl phosphonium chloride and a polymer thereof, dehydroacetic acid and an alkali metal salt thereof, and sorbic acid and an alkali metal salt thereof; wherein the total amount of supported chemical components on said short wood pulp fiber containing carrier is in the range of 0.1 to 50% by weight of the air purifying agent;

the pore volume of said carrier is within the range from 0.5 to 3.0 ml/g; and

said agent contains water in an amount ranging from 5 to 15% by weight per total weight.

5,462,694

MESOMORPHIC COMPOUND, LIQUID CRYSTAL COMPOSITION CONTAINING THE COMPOUND, LIQUID CRYSTAL DEVICE USING THE COMPOSITION, LIQUID CRYSTAL APPARATUS AND DISPLAY METHOD

Yoko Kosaka, Atsugi; Takao Takiguchi, Tokyo; Takashi Iwaki, Machida; Takeshi Togano, Yokohama; Shinichi Nakamura, Isehara, and Ikuo Nakazawa, Atsugi, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

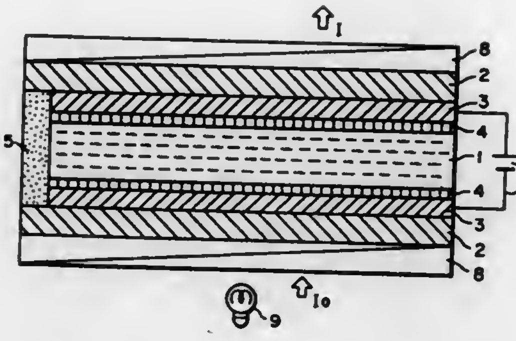
Filed Aug. 30, 1994, Ser. No. 297,777

Claims priority, application Japan, Aug. 31, 1993, 5-237213; Aug. 26, 1994, 6-224046

Int. Cl.^{6} C09K *19/34;19/32;19/30;* **G02F** *1/13*

U.S. Cl. 252—299.61 **25 Claims**

1. A mesomorphic compound represented by the following formula (I):



R^1—A—R^2 (I),

wherein R^1 and R^2 independently denote R^3 or R^4—A^0—Y^1—(CH$_2$269400_001Y^2—, and at least one of R^1 and R^2 is R^4—A^0—Y^1—(CH$_2$269400_001Y^2—, in which

R^3 denotes H, F, or a linear, branched or cyclized alkyl group having 1–18 carbon atoms capable of including at least one —CH$_2$— group which can be replaced with —O—, —S—, —CO—, —CH═CH—, —C≡C— or —CH(CN)— provided that heteroatoms are not adjacent to each other and capable of including at least one H which can be replaced with F,

R^4 denotes H, F or a linear or branched alkyl group having 1–12 carbon atoms capable of including at least one —CH$_2$— group which can be replaced with —O—, —S—, —CO—, —CH═CH—, —C≡C— or —CH(CN)— provided that heteroatoms are not adjacent to each other and capable of including at least one H which can be replaced with F,

Y^1 and Y^2 independently denote —CH$_2$—, —O—, —COO— or —OCO—, and

m is an integer of 1–16; and

A denotes —A^1—Z—A^2— or —A^1—A^2—Z—A^3— in which

Z denotes a single bond, —CH$_2$—, —OCH$_2$—, —COO—, —OCO—, —COS—, —SCO—, —C≡C— or —CH═CH—, and

A^0, A^1, A^2 and A^3 independently denote a divalent cyclic group selected from α class or β class listed below, and at least one of A^0, A^1, A^2 and A^3 independently denotes a divalent cyclic group selected from the β class,

α class: 1,4-phenylene capable of including at least one H which can be replaced with. F, CH$_3$ or CF$_3$; 1,4-cyclohexylene; pyrimidine-2,5-diyl; pyridine-2,5-diyl; thiazole-2,5-diyl; thiophene-2,5-diyl; and 2,6-naphthylene, and

β class: thiazole-2,5-diyl; benzothiazole-2,6-diyl; benzoxazole-2,5-diyl; indan-2,5-diyl; coumaran-2,5-diyl; quinoxaline-2,6-diyl; quinoline-2,6-diyl; 1,2-dithiolan-3,5-diyl; and furan-2,5-diyl.

5,462,695

CHIRAL LIQUID CRYSTAL MATERIALS AS DOPANT FOR FERROELECTRIC LIQUID CRYSTAL COMPOSITIONS

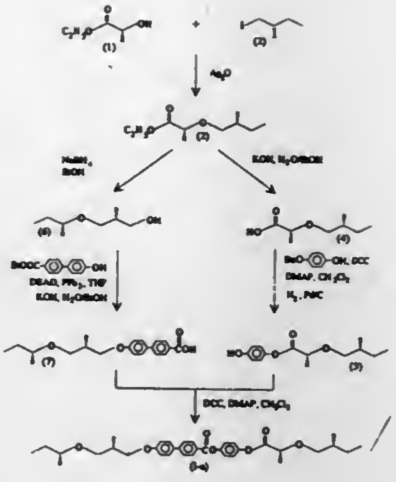
Wen-Liang Tsai, Tainan, and Chein-Dhau Lee, Hsinchu, both of, Taiwan, Prov. of China, assignors to Industrial Technology Research Institute, Hsinchu, Taiwan, Prov. of China

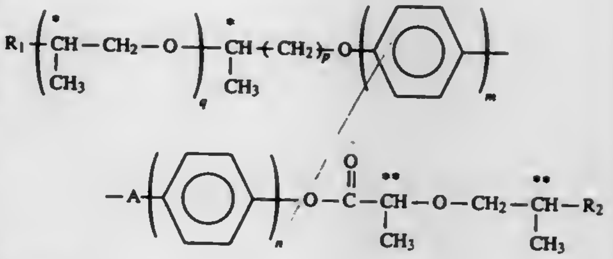
Filed Jun. 30, 1994, Ser. No. 269,793

Int. Cl.^{6} C09K *19/12;19/20;* **C07C** *69/76*

U.S. Cl. 252—299.65 **12 Claims**

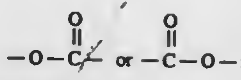
12. A ferroelectric liquid crystal composition comprising an achiral smectic C liquid crystal compound and a dopant, said dopant being represented by the following formula:





wherein:

R_1 is a C_2 to C_{10} alkyl group, R_2 is a C_2 to C_8 alkyl group;
A is either



$$-O-\overset{O}{\overset{\|}{C}}- \text{ or } -\overset{O}{\overset{\|}{C}}-O-;$$

m is an integer of 1 or 2;
n is an integer of 1 or 2;
p and q are integers of 0 or 1, provided that when p=0. q=0, and p=1, q=1; and
* and ** indicate, independently of each other, S- or R-stereoisomeric structure.

5,462,696

ELECTRICALLY-CONDUCTIVE AND IONICALLY-CONDUCTIVE POLYMERIC NETWORKS AND THEIR PREPARATION

Vincent D. McGinniss, Sunbury; Albert R. Bunk, Columbus, both of Ohio, and Hiroyuki Mikuni, Sagamihara, Japan, assignors to Three Bond Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 936,106, Aug. 26, 1992, abandoned. This application Jan. 10, 1994, Ser. No. 179,811

Int. Cl.^{6} H01B *1/00;1/12;1/20*

U.S. Cl. 252—500 **6 Claims**

1. An ultraviolet radiation (UV) cured electrically-conductive polymeric network, which comprises:

a UV cured, thermosetting polymeric network which contains at least about 0.5% by weight of a UV sensitizer selected from one or more of the group consisting of: a halogenated polynuclear ketone; an organic carbonyl compound selected from alkyl phenones, benzophenones, and tricyclic fused ring compounds; carbonylated phenol nuclear sulfonyl chlorides; and aromatic carbonyl compounds, aromatic aldehydes, or aromatic ketones in combination with a synergistic sensitizer of about 0.05% to about 3% by weight of 2,2'-dithiobis(benzothiazole), and between about 1 and 20% by weight of an oxidized additive comprising one or more of an oxidizable aniline, thiophene, or pyrrole additive, which additive was oxidized with an oxidizing agent in situ in the cured polymeric network by applying a solution of said oxidizing agent to a surface of said UV cured, thermosetting polymeric network with a laminating film placed over the applied solution of said oxidizing agent.

5,462,697

HARD SURFACE CLEANERS/MICROEMULSIONS COMPRISING AN ANTICOMSION SYSTEM TO PROTECT ACID-SENSITIVE SURFACES

Georges Ylanakopoulos, Liege, Belgium, assignor to Colgate-Palmolive Co., Piscataway, N.J.

Filed Nov. 22, 1993, Ser. No. 155,315

The portion of the term of this patent subsequent to May 16, 2012, has been disclaimed.

Int. Cl.⁶ C11D *3/30;1/62;17/00*

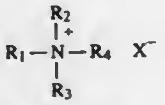
U.S. Cl. 252—528 **16 Claims**

1. A cleaning composition comprising approximately by weight:

(a) 1% to 30% of at least one surfactant selected from the group consisting of nonionic surfactants and anionic surfactants, wherein said anionic surfactant is selected from the group consisting of C_{9-15} alkyl benzene sulfonates, C_{10-20} alkane sulfonates, C_8–C_{18} alkyl sulfates, C_8–C_{18} alkyl ether polyethenoxy sulfates and C_8–C_{12} alkyl phenyl ether polyethenoxy sulfates;

(b) 0,005% to 2.0% of phosphoric acid;

(c) 0.25% to 5% of a compound having the formula



$$R_1-\underset{\underset{\displaystyle R_3}{|}}{\overset{\overset{\displaystyle R_2}{|+}}{N}}-R_4 \quad X^-$$

wherein R_1 is a methyl group and R_2, R_3 and R_4 are independently selected from the group consisting of CH_3, C_2H_5, CH_2CH_2Y and $CH_2CH_2CH_2Y$, wherein Y is selected from the group consisting of Cl, Br, CO_2H, $(CH_2O)nOH$, wherein n is 1 to 10 and OH, and X— is selected from the group consisting of Cl, Br, methosulfate;

(d) 1 to 10% of at least one organic acidic cosurfactant;

(e) 0.05% to 0.3% of a perfume or a water insoluble hydrocarbon; and

(f) the balance being water.

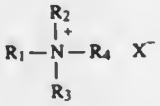
9. A stable microemulsion cleaning composition comprising approximately by weight:

(a) 0.1% to 15.0% of a nonionic surfactant;

(b) 0.1% to 20% of an anionic surfactant, wherein said anionic surfactant is selected from the group consisting of C_{9-15} alkyl benzene sulfonates, C_{10-20} alkane sulfonates, C_8–C_{18} alkyl sulfates, C_8–C_{18} alkyl ether polyethenoxy sulfates and C_8–C_{12} alkyl phenyl ether polyethenoxy sulfates;

(c) 0.005% to 2.0% of phosphoric acid;

(d) 0.25% to 7% of a compound having the formula



$$R_1-\underset{\underset{\displaystyle R_3}{|}}{\overset{\overset{\displaystyle R_2}{|+}}{N}}-R_4 \quad X^-$$

wherein R_1 is a methyl group and R_2, R_3 and R_4 are independently selected from the group consisting of CH_3, C_2H_5, CH_2CH_2Y and $CH2CH_2CH_2Y$, wherein Y is selected from the group consisting of C_1, Br, CO_2H, $(CH_2O)nOH$, wherein n is 1 to 10 and OH, and X— is selected from the group consisting of Cl, Br, methosulfate;

(e) 1 to 10% of at least one organic acidic cosurfactant;

(f) 0.1% to 10.0% of a perfume or a water insoluble hydrocarbon; and

(g) the balance being water.

5,462,698

PHOTOCHROMIC COMPOSITION

Takashi Kobayakawa; Satoshi Imura; Kazumasa Itonaga, and Kazuhiko Kuramoto, all of Tokuyama, Japan, assignors to Tokuyama Corporation, Tokuyama, Japan

Continuation-in-part of Ser. No. 24,764, Mar. 2, 1993, Pat. No. 5,395,566. This application Mar. 31, 1994, Ser. No. 221,418

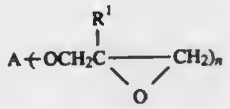
Claims priority, application Japan, Mar. 3, 1992, 4-45813

Int. Cl.⁶ G02B *5/23*

U.S. Cl. 252—586 **15 Claims**

1. A photochromic composition comprising (A) 100 parts by weight of a compound having at least one epoxy group in the molecule represented by the formula (I), (B) 0.0001 to 10,000 parts by weight of a fulgide compound represented by the formula (II), (C) 1 to 99,999 parts by weight of a monomer represented by the formula (III) and (D) 1 to 99,999 parts by weight of a monomer represented by the formula (IV);

wherein the total amount of (C) and (D) is 10 to 100,000 parts by weight; and wherein formula (I) is as follows:



(I)

wherein R^1 is a hydrogen atom or a methyl group,

wherein n is 1 or 2,

when n is 1, A is an alkyl group having 2 to 20 carbon atoms which may be substituted by a hydroxyl group, a group represented by

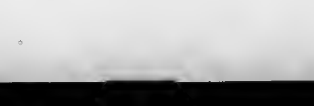
$$-R(OR)_mOH,$$

in which R is an alkylene group having 2 to 4 carbon atoms and m is an integer of 1 to 20, a cycloalkyl group having 6 to 7 carbon atoms which may be substituted by a hydroxyl group, a phenyl group which may be substituted by a hydroxyl group, or a benzoyl group which may be substituted by a carboxyl group,

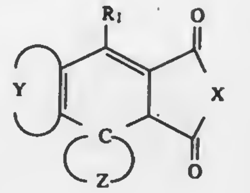
when n is 2, A is an alkylene group having 2 to 20 carbon atoms which may be substituted by a hydroxyl group, a group represented by

$$-R(OR)_m,$$

in which R is an alkylene group having 2 to 4 carbon atoms and m is an integer of 1 to 20, a cycloalkylene group which may be substituted by a hydroxyl group, a phenylene group which may be substituted by a hydroxyl group, a phthaloyl group, which may be substituted by a hydroxyl group, an isophthaloyl group, a terephthaloyl group or a group shown by

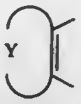


formula (II) is as follows:



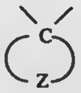
(II)

wherein



is a divalent aromatic hydrocarbon group containing a benzene ring or 2 to 3 fused benzene rings, or a divalent unsaturated heterocyclic group containing a 5- or 7-member ring and having 1 to 2 oxygen atoms, nitrogen atoms or sulfur atoms as ring-constituting atoms, wherein each may have a substituent selected from halogen atoms, alkyl groups having 1 to 4 carbon atoms, alkoxy groups having 1 to 4 carbon atoms, aryl groups having 6 to 10 carbon atoms, alkoxyaryl groups having 7 to 14 carbon atoms, aryl groups having 6 to 10 carbon atoms substituted by alkoxy groups having 1 to 4 carbon atoms, amino group, nitro group, and cyano group, wherein R^1 is an alkyl group having 1 to 4 carbon atoms, an aryl group having 6 to 10 carbon atoms, and a monovalent heterocyclic group containing nitrogen atoms or sulfur atoms as ring-constituting atoms or fused rings of the multi-membered ring and a benzene ring,

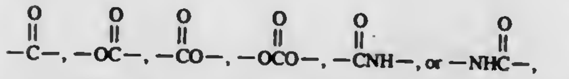
wherein



is a norbornylidene group or an adamantylidene group, wherein X is an oxygen atom, a group $>N—R^2$, a group

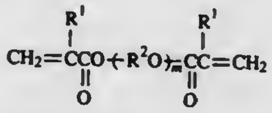
$$>N-A_1-B_1\leftarrow\!\!\left(A_2\right)_{\overline{m}}\leftarrow\!\!\left(B_2\right)_{\overline{n}}R^3,$$

a group $>N—A_3—A_4$ or a group $>N—A_3—R^4$ in which R^2 is a hydrogen atom, an alkyl group having 1 to 4 carbon atoms or an aryl group having 6 to 10 carbon atoms, A_1, A_2 or A_3 are the same or different and each represents an alkylene group having 1 to 4 carbon atoms or an alkylidene group having 2 to 4 carbon atoms, a cycloalkylene group or a dimethylcyclohexane-diyl group, B_1 and B_2 are the same or different and each may represent



$$-\overset{\overset{\displaystyle O}{\|}}{C}-,\ -O\overset{\overset{\displaystyle O}{\|}}{C}-,\ -\overset{\overset{\displaystyle O}{\|}}{C}O-,\ -O\overset{\overset{\displaystyle O}{\|}}{C}O-,\ -\overset{\overset{\displaystyle O}{\|}}{C}NH-,\text{ or }-NH\overset{\overset{\displaystyle O}{\|}}{C}-,$$

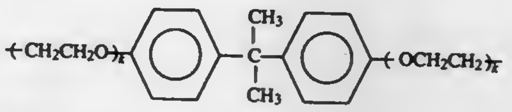
m and n are independently 0 or 1, and when m is 0, n is 0, R^3 is an alkyl group having 1 to 4 carbon atoms, a naphthyl group or a naphthylalkyl group having 11 to 14 carbon atoms, A_4 is a naphthyl group, and R^4 is a halogen atom, a cyano group or a nitro group; formula III is as follows:



$$CH_2=\overset{\overset{\displaystyle R^1}{|}}{\underset{\underset{\displaystyle O}{\|}}{C}}CO\leftarrow\!\!\left(R^2O\right)_{\overline{m}}\overset{\overset{\displaystyle R^1}{|}}{\underset{\underset{\displaystyle O}{\|}}{C}}C=CH_2 \qquad \text{(III)}$$

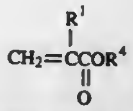
wherein R^1 is a hydrogen atom or a methyl group,

wherein R^2 is an alkylene group having 1 to 4 carbon atoms, or a group represented by the following formula



in which k is 0 or 1,

wherein m is an integer of 2 to 20, and formula (IV) is as follows:



$$CH_2=\overset{\overset{\displaystyle R^1}{|}}{C}\underset{\underset{\displaystyle O}{\|}}{C}OR^4 \qquad \text{(IV)}$$

wherein R^1 is a hydrogen atom or a methyl group,

wherein R^4 is an alkyl group having 1 to 4 carbon atoms which may be substituted by a hydroxyl group, an aryl group containing 6 to 10 carbon atoms which may be substituted by a halogen atom, or an aralkyl group containing 7 to 10 carbon atoms which may be substituted by a halogen atom.

5,462,699
FIRE RETARDANT MATERIALS AND METHODS OF USE THEREOF

Robert L. Montgomery, Dunnellen, Fla., assignor to Fireblock International, Inc., Leesburg, Fla.

Division of Ser. No. 42,022, Apr. 2, 1993, abandoned. This application Jan. 21, 1994, Ser. No. 184,829

Int. Cl.^{6} C09K *21/02;* C09D *5/16;* B27N *9/00*

U.S. Cl. 252—609 **14 Claims**

1. A method of preparing a fire retardant material comprising the step of,

applying a fire retarding amount of a silicate fire retardant composition consisting essentially of silicate, water, and surfactant, to one or more surfaces of a cellular foam plastic sheet material, such that the silicate fire retardant composition fully penetrates said sheet material,

wherein the ratio of the silicate to water in the silicate fire retardant composition is between approximately 20/80 (w/w) and approximately 33/67 (w/w), and wherein the volume of the surfactant is between approximately 16 and 64 ounces per approximately 600 pounds of silicate and water.

5,462,700
PROCESS FOR MAKING AN ARRAY OF TAPERED PHOTOPOLYMERIZED WAVEGUIDES

Karl W. Beeson, Mercer; Scott M. Zimmerman; Paul M. Ferm, both of Morris, and Michael J. McFarland, Warren, all of N.J., assignors to AlliedSignal Inc., Morristown, N.J.

Filed Nov. 8, 1993, Ser. No. 148,794

Int. Cl.^{6} B29D *11/00*

U.S. Cl. 264—1.27 **20 Claims**

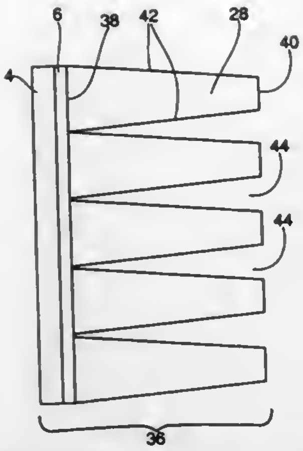
1. A process comprising the steps of:

(a) placing a photomask in substantial contact with a substrate wherein said photomask has opaque and transparent regions;

(b) placing a substantially uniform thickness of photopolymerizable mixture on said substrate so that said substrate is positioned between said photopolymerizable mixture and said photomask wherein:

(i) said photopolymerizable mixture comprises at least one reactive monomer and photoinitiator, and

(ii) said photoinitiator is present in an amount sufficient to form a gradient of substantially collimated actinic radiation



across the thickness of said photopolymerizable mixture during subsequent step (c);

(c) while maintaining said photopolymerizable mixture and substrate in a substantially fixed plane relative to said substantially collimated actinic radiation, exposing through said transparent regions of said photomask said photopolymerizable mixture to said substantially collimated actinic radiation for a time sufficient to form an array of tapered photopolymerized waveguides wherein:
  (i) the tapered end of each of said waveguides extends outward from said substrate,
  (ii) each of said waveguides has a light input surface adjacent said substrate and a light output surface distal from said light input surface, and
  (iii) the area of the light input surface of each of said waveguides is greater than the area of its light output surface; and

(d) removing said photomask and photopolymerizable mixture which was not substantially polymerized by said substantially collimated actinic radiation during step (c) from said substrate.

5,462,701

SHEET-LIKE POLYETHYLENE TEREPHTHALATE MATERIALS HAVING SLIGHT SURFACE ROUGHNESS, THEIR PREPARATION AND THEIR USE

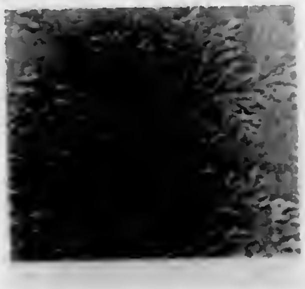
Alfred Hagemeyer, Rheine; Hans-Peter Schildberg, Mannheim; Hartmut Hibst, Schriesheim, all of, Germany; Dieter Baeuerle, Altenberg, Austria, and Johannes Heitz, Freiburg, Germany, assignors to BASF Magnetics GmbH, Mannheim, Germany

Division of Ser. No. 41,041, Mar. 31, 1993. This application Sep. 27, 1994, Ser. No. 310,764

Claims priority, application Germany, Apr. 8, 1992, 42 11 712.7

Int. Cl.^{6} B05D *1/04*

U.S. Cl. 264—482 **4 Claims**



1. A process for the production of slight surface roughness on a short of polyethylene terephthalate material, wherein the surface roughness consisting of dendritic, plateau structures having a fissured, fractal edge with a height of from 2 to 50 nm and a ratio of circumference to height of more than 500 is produced by exposing the polyethylene terephthalate material under reduced pressure to UV light produced by decomposition of excimers, in a wavelength range of from 150 to 400 nm at less than 100° C.

5,462,702

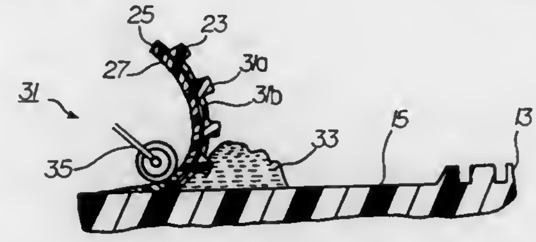
METHOD FOR RESURFACING FIBERGLASS BOAT HULLS

Gibbs M. Slaughter, Jr., Rte. 9, Box 146-B, Fort Worth, Tex. 76179

Continuation-in-part of Ser. No. 830,837, Feb. 4, 1992, Pat. No. 5,246,642. This application Sep. 16, 1993, Ser. No. 122,728

Int. Cl.^{6} B29C *35/02;73/00;* **B32B** *35/00*

U.S. Cl. 264—36 **11 Claims**



1. A method of forming a surface texture on a recipient surface, the method comprising the steps of:

providing a flexible mold having an impression of the surface texture to be formed therein; then

applying a layer of fluid polymeric casting material upon the flexible mold; then

partially curing the layer of fluid casting material to a flexible state, wherein the impression of the surface texture to be replicated is transferred to the layer of partially cured casting material; then

securing the layer of partially cured casting material and the flexible mold to the recipient surface; then

fully curing the casting material; and then

removing the flexible mold, wherein the layer of fully cured casting material and the surface texture remains on the recipient surface.

5,462,703

Patent Not Issued For This Number

5,462,704

METHOD FOR PREPARING A POROUS POLYURETHANE VASCULAR GRAFT PROSTHESIS

Jui-Hsiang Chen, Hsinchu; Jeng Wei, Taipei; Andrew T. Hu, Hsinchu; Yu-Der Lee, Hsinchu; Ru-Fong Laiw, Hsinchu; Muh-Lan Chen, Hsinchu; Chung-Yi Chang; Fan-Yen Lee, both of Taipei, and Shu-Fang Jiang, Hsinchu, all of, Taiwan, Prov. of China, assignors to Industrial Technology Research Institute, Hsinchu, Taiwan, Prov. of China

Filed Apr. 26, 1994, Ser. No. 233,455

Int. Cl.^{6} B29C *67/20*

U.S. Cl. 264—41 **12 Claims**

1. A method of preparing porous polyurethane vascular graft, comprising the following steps:

(a) coating a solvent type polyurethane resin on the outer surface of a cylindrical mandrel, said polyurethane resin being prepared from polytetramethylene glycol, glycols and 4,4'-diphenylmethane diisocyanate, and having a solid content of 15–45 percent by weight and a viscosity of 10,000 to 150,000 centipoises;

(b) within 30 seconds after the coating step (a) placing the coated mandrel in a static coagulant having a temperature of 15°–40° C. for 2 to 12 hours to form a porous polyurethane tubing surrounding the mandrel, said coagulant consisting of water, ethanol and, optionally, an aprotic solvent;

(c) placing the mandrel surrounded with the porous polyurethane tubing in a swelling agent for 5 to 60 minutes, said swelling agent containing at least 90 percent by weight ethanol;

(d) separating the porous polyurethane tubing from the mandrel;

(e) rinsing the porous polyurethane tubing with a solution containing at least 80 percent by weight ethanol for 5 to 120 minutes; and

(f) drying the porous polyurethane tubing to obtain a porous polyurethane vascular graft with an area porosity of 15°–50% and a pore size of 1 to 30 μm.

5,462,705

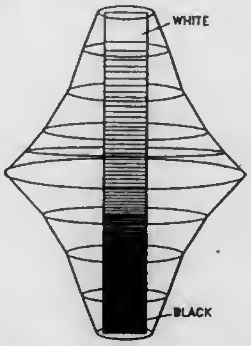
METHOD OF FORMING DIFFUSELY REFLECTING SINTERED FLUORINATED LONG-CHAIN ADDITION POLYMERS DOPED WITH PIGMENTS FOR COLOR STANDARD USE

Arthur W. Springsteen, Wilmot Center, N.H., assignor to Labsphere, Inc., North Sutton, N.H.

Division of Ser. No. 921,980, Jul. 30, 1992, abandoned, which is a continuation of Ser. No. 483,254, Feb. 22, 1990, abandoned, which is a continuation-in-part of Ser. No. 263,633, Oct. 27, 1988, Pat. No. 4,912,720. This application Jan. 14, 1993, Ser. No. 4,513

Int. Cl.^{6} B29C *67/24*

U.S. Cl. 264—122 **14 Claims**



1. A method of fabricating a diffusely reflecting fluorinated long-chain addition polymer doped with pigments to produce a color standard, that comprises, adding solid particle pigment dopant to a fluorinated aliphatic addition polymer solid particle material, with a concentration of pigment dopant particles sufficient to produce the desired hue, value and chroma of the standard; blending the material to produce a mixture of uniform appearance; compressing the blended material to a suitable compressing density for the desired standard color; sintering the compressed material at atmospheric pressure; cooling the sintered material; and finishing the surface of the sintered product by machining and abrasive treatment.

5,462,706

METHOD FOR FORMING A FLANGE ON AN END OF A SYNTHETIC LINER

James S. McMillan, Benbrook, and Simon Tarsha, Fort Worth, both of Tex., assignors to Pipe Rehab International, Inc., Memphis, Tenn.

Continuation of Ser. No. 934,117, Aug. 21, 1992, abandoned. This application Nov. 9, 1993, Ser. No. 151,468

Int. Cl.^{6} B29C *57/00;63/34;65/02*

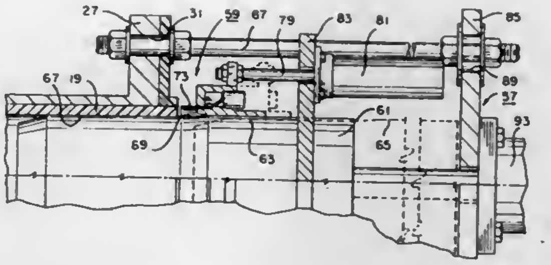
U.S. Cl. 264—138 **13 Claims**

1. A method for forming a flange on an end of a synthetic plastic liner of the type used to line a tubular member having opposed flanged ends, the synthetic liner having an exterior surface and opposing ends at least one of which extends outwardly to be exposed from one of the opposing ends of the tubular member, the method comprising the steps of:

supplying a synthetic disc formed from a synthetic elastomer which is compatible with the synthetic liner, the synthetic disc having an outer lateral face, an outer peripheral lip and a central bore which defines an internal lip;

installing the synthetic disc about the exterior surface of the exposed end of the synthetic liner and moving the disc into position flush with the flanged end of the tubular member, whereby the internal lip of the synthetic disc is seated on the exterior surface of the synthetic liner; and

fusing the synthetic disc to the exterior of the synthetic liner by heating the areas adjacent the internal lip of the disc and the exterior surface of the exposed end of the synthetic liner to form a molten weld area therebetween.



5,462,707

METHOD OF PRODUCING ELASTIC WIPING BLADE FOR WINDSHIELD WIPER OF MOTOR VEHICLE

Tibor Nagy, Leuven, Belgium, assignor to Robert Bosch GmbH, Stuttgart, Germany

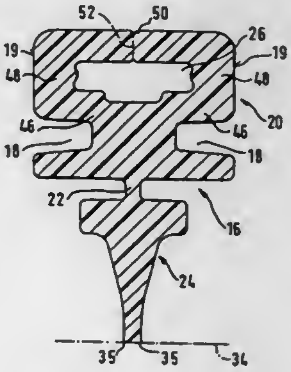
Filed May 19, 1994, Ser. No. 246,099

Claims priority, application Germany, Jun. 9, 1993, 43 19 139.8

Int. Cl.^{6} B29C *69/00*

U.S. Cl. 264—146 **3 Claims**

1. A method of producing an elastic elongated wiping blade for a windshield wiper of a motor vehicle, which wiping blade includes a rear strip supported by a support and having a longitudinal passage which is closed from all sides by walls of the rear strip in a longitudinal direction for receiving an elastic reinforcing rail, the method comprising the steps of extruding a wiping blade of a material in plastic deformable condition from an extruder nozzle; opening a longitudinal passage in the rear strip during exiting from the extruder nozzle over a longitudinal slot; closing the longitudinal slot by abutting wall portions of the longitudinal passage which form edges of the slot against one another in soft condition so that the wall portions are connected with one another; and hardening the wiping blade so that the longitudinal passage is closed around in a longitudinal direction.



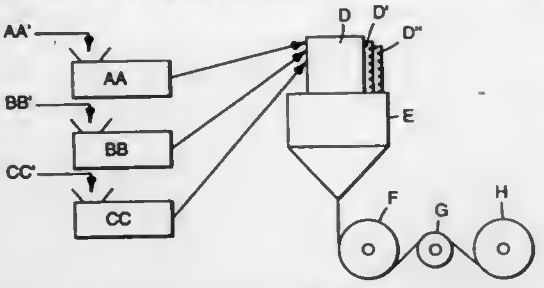
5,462,708
ELASTIC FILM LAMINATE

Douglas A. Swenson, St. Paul; Herbert J. Fox, Maplewood, both of Minn.; Dennis L. Krueger, Hudson Township, St. Croix County, Wis., and Rochelle L. Lockridge, Maplewood, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 249,538, May 26, 1994, Pat. No. 5,422,178, which is a division of Ser. No. 901,420, Jun. 19, 1992, Pat. No. 5,376,430. This application Dec. 16, 1994, Ser. No. 358,206

Int. Cl.^{6} B29C *63/00*

U.S. Cl. 264—174.11 **3 Claims**



1. A method for forming an elastic film laminate comprising a continuous elastomeric core layer of at least a first thickness and at least one continuous inelastic skin outer layer of oriented plastic having a second thickness less than the first thickness, where the film laminate is divided into at least on elastic region and at least one non-elastic region, the elastomeric core layer in the non-elastic region having a thickness less than said first thickness when the elastomer is in the relaxed state and in substantially continuous planar contact with the at least one outer skin layer, the elastomeric core layer in the at least one elastic region having said first thickness and having an overlying skin layer having an outer surface area greater than the planar surface area of the elastomeric layer in the elastic region in the relaxed state, the method characterized by:

providing a multi-layer laminate of the at least one skin layer and the at least on elastomeric core layer,

stretching the multi-layer laminate past the elastic limit of the at least one skin layer causing it to deform,

heating the stretched multi-layer laminate in pre-selected regions randomizing the elastic in these regions, and

recovering the stretched multi-layer laminate in the non-heat treated regions to form the elastic regions of the elastic film laminate.

5,462,709
PROCESS FOR COLORING THERMOPLASTICS

Sunil Satija, Holland; Daniel M. Wade, Lansdale, both of Pa., and Ronald C. Reynolds, Louisville, Ky., assignors to Atohaas B.V., Haarlem, Netherlands

Continuation of Ser. No. 145,262, Oct. 29, 1993, abandoned. This application Jan. 10, 1995, Ser. No. 371,055

Int. Cl.^{6} B29C *45/46;47/36*

U.S. Cl. 264—211 **5 Claims**

1. A process for coloring thermoplastics in an extruder comprising:

a) conducting into a mixing zone of the extruder a molten thermoplastic selected from at least one of (1) a polyglutarimide or (2) a polymer containing at least 80 weight percent of units derived from methyl methacrylate;

b) admixing the molten thermoplastic in the mixing zone of the extruder with a dispersion consisting essentially of at least one pigment, dye, or colorant in a suitable non-aqueous, non-volatile, non-plasticizing, clear carrier, the pigment, dye, or colorant being present at from about 0.0001 parts to about 5 parts per 100 parts of thermoplastic, the suitable non-aqueous, non-volatile non-plasticizing, clear carrier being present at from about 15 parts to about 99.9 parts per 100 parts of the dispersion, and the suitable non-aqueous, non-volatile, non-plasticizing, clear carrier being present at no more than about 1 part per 100 parts of thermoplastic; and

c) conducting the admixed colored thermoplastic into an extrusion zone or injection molding zone.

5,462,710
MANUFACTURING METHOD OF A FLANGE FOR USE IN A FILM CARTRIDGE

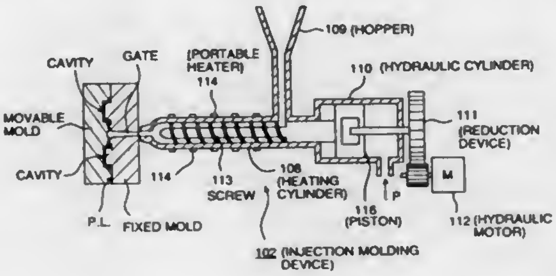
Osamu Shibazaki, and Hitoshi Ohkubo, both of Hino, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Nov. 8, 1993, Ser. No. 148,848

Claims priority, application Japan, Nov. 10, 1992, 4-324857

Int. Cl.^{6} B29C *45/40*

U.S. Cl. 264—297.2 **9 Claims**



1. A method of manufacturing a rotatable molded flange, to be mounted on a spool shaft in film cartridges, by an injection molding process, comprising the steps of:

providing a mold, said mold including at least one cavity therein to form the rotatable molded flange, the rotatable molded flange comprising:

an annular portion having an outer circumferential surface,

a flat disk portion integral with one end of the annular portion, the flat disk portion having a central opening into which the spool shaft is inserted so that the flange is rotated together with the spool shaft around a rotation axis of the spool shaft, and

a collar ring portion integral with the other end of the annular portion, an outer diameter of the collar ring portion being larger than a diameter of a circumferential surface of the annular portion so that the collar ring portion extends in a radial direction away from an axis of the annular portion and projects beyond the circumferential surface of the annular portion;

forming a gate in the mold to provide a fluid communication to the at least one cavity;

injecting a resin into the at least one cavity in the mold through said gate, said at least one cavity corresponding in a shape thereof to both the rotatable molded flange and to the gate;

the gate being formed in the mold to be at a position opening to the outer circumferential surface of the annular portion so that the resin is injected into the at least one cavity through the gate;

removing the rotatable molded flange from the mold; and

allowing a remaining molded gate portion of the rotatable molded flange to remain on the outer circumferential surface of the annular portion of the rotatable molded flange, wherein a height of the remaining molded gate portion does not extend above a top potion of the collar ring portion.

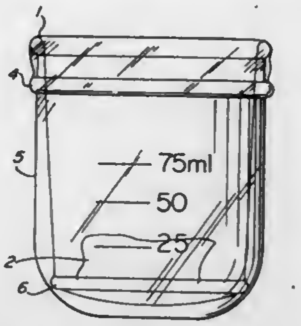
5,462,711
DISPOSABLE BEAKER SHEATH

Jacqueline L. Ricottone, 141 Promontory Dr. W., Newport Beach, Calif. 92660

Continuation of Ser. No. 941,979, Sep. 8, 1992, abandoned, which is a continuation of Ser. No. 629,118, Dec. 17, 1990, abandoned. This application Apr. 28, 1994, Ser. No. 234,933

Int. Cl.^{6} A61L *2/02;2/18;* **A61J** *1/00;* **B65D** *30/16*

U.S. Cl. 422—1 **5 Claims**



3. A method for maintaining sterility of a container during processing of a medical item disposed in the container, the method comprising the steps of:

(a) providing a cylindrical container having an open mouth and a closed base end;

(b) providing a disposable, bacteriologically impermeable sheath formed of a flexible material, the sheath having an open end and a closed end connected by a substantially cylindrical side wall, having a rigid O-ring-shaped member formed peripherally around the closed end, the open end being elastic;

(c) inserting the disposable sheath into the container with the open end of the sheath closely fitted over an outer upper periphery of the open mouth of the container, and disposing the closed end of the sheath adjacent to an inner surface of the closed base end of the container, the rigid O-ring-shaped member being disposed substantially in contact with a juncture between the closed base end inner surface of the container and an inner surface of the sidewalls of the container;

(d) placing an item to be processed into the disposable sheath, the item being isolated from the container by the sheath;

(e) processing the item including covering the item with a disinfectant liquid;

(f) removing the processed item from the sheath;

(g) discarding the sheath and liquid; and

(h) repeating steps (b)–(h) with a new sheath if an additional item is to be processed.

5,462,712
HIGH STRENGTH AL-CU-LI-ZN-MG ALLOYS

Timothy J. Langan, Baltimore; Joseph R. Pickens, Beltsville; Frank H. Heubaum, and Lawrence S. Kramer, both of Baltimore, all of Md., assignors to Martin Marietta Corporation, Bethesda, Md.

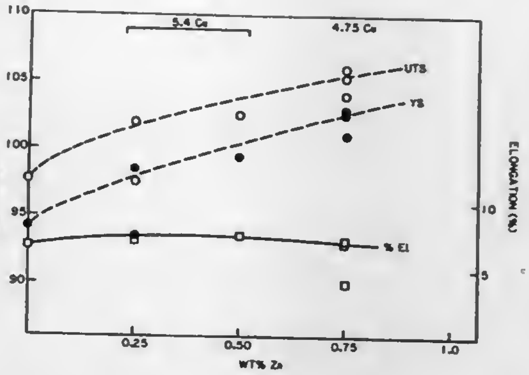
Continuation of Ser. No. 32,158, Mar. 23, 1993, abandoned, which is a continuation of Ser. No. 493,255, Mar. 14, 1990, abandoned, which is a continuation-in-part of Ser. No. 327,666, Mar. 23, 1989, Pat. No. 5,259,897, which is a continuation-in-part of Ser. No. 233,705, Aug. 18, 1988, abandoned. This application Jul. 1, 1994, Ser. No. 269,615

The portion of the term of this patent subsequent to Nov. 9, 2010, has been disclaimed.

Int. Cl.^{6} C22C *21/00*

U.S. Cl. 420—528 **51 Claims**

1. An aluminum-base alloy consisting essentially of from about 3.5 to about 7 weight percent Cu, from about 0.5 to about 1.8 weight percent Li, from about 0.5 to about 4 weight percent Zn, from about 0.05 to about 3 weight percent Mg, from about 0.01 to about 2 weight percent grain refiner selected from the group consisting of Zr, Cr, Mn, Ti, Hf, V, Nb, B, TiB_2 and combinations thereof, and the balance aluminum and incidental impurities, wherein the alloy is capable of a yield strength of greater than 85 ksi and an elongation of greater than 5 percent in the cold worked, artificially aged condition.



5,462,713
DOUBLE REDOX SYSTEM FOR DISINFECTING CONTACT LENSES

Ronald L. Schlitzer, Fort Worth; N. L. Dassanayake, and Rajkumar P. Bhatia, both of Arlington, all of Tex., assignors to Alcon Laboratories, Inc., Fort Worth, Tex.

Division of Ser. No. 928,643, Aug. 13, 1992, abandoned, which is a continuation of Ser. No. 526,759, May 22, 1990, abandoned. This application Aug. 16, 1993, Ser. No. 107,268

Int. Cl.^{6} A01N *59/08;59/12;* **A61L** *2/18*

U.S. Cl. 422—37 **8 Claims**

1. An improved method for rapidly and effectively disinfecting a contact lens, comprising:

(a) providing a contact lens to be disinfected;

(b) placing the lens in an aqueous solution;

(c) providing a water soluble salt of dichloroisocyanurate as a source of hypochlorite and providing a source of a water soluble iodide salt;

(d) forming a disinfecting solution by releasing an antimicrobial effective amount of hypochlorite and iodide in said aqueous solution, said hypochlorite and iodide reacting to form halogen species including iodine species, whereby the lens is rapidly and effectively disinfected by the combined actions of the hypochlorite and the halogen species;

(e) providing a source of ascorbate; and

(f) releasing an amount of ascorbate in said disinfecting solution sufficient to neutralize said iodine species.

5,462,714
ANTIMICROBIAL COMPOSITION AND METHODS OF USE

Ramesh T. Talwalker, and Shirish S. Barve, both of Lexington, Ky., assignors to Arda Technologies, Lexington, Ky.

Continuation-in-part of Ser. No. 949,432, Sep. 22, 1992. This application Mar. 18, 1994, Ser. No. 210,523

Int. Cl.^{6} A61K *33/18*

U.S. Cl. 422—37 **17 Claims**

1. An antimicrobial composition, comprising by weight percent:
0.25–2.0% available iodine;
20.0–50.0% fatty acid;
15.0–35.0% non-ionic surfactant;
5.0–16.0% (w/v) buffering agent; and
10.0–60.0% (v/v) water, and having a pH between 3.0 and 5.0.

5,462,715
CUVETTE CONVEYOR

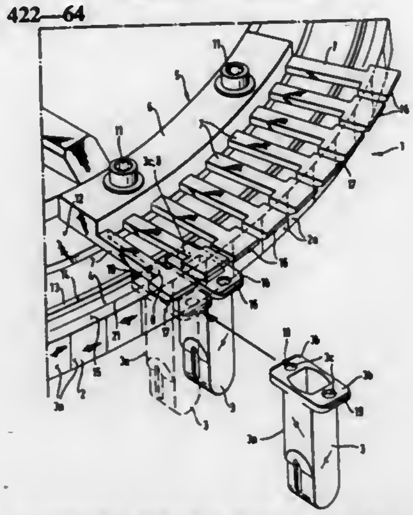
Bruno Koch, Cham, and Gottlieb Schacher, Ebikon, both of, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation of Ser. No. 154,578, Nov. 19, 1993, abandoned, which is a continuation of Ser. No. 40,043, Mar. 30, 1993, abandoned. This application Aug. 8, 1994, Ser. No. 286,892

Claims priority, application European Pat. Off., Apr. 6, 1992, 92105902

Int. Cl.⁶ G01N *33/00*

U.S. Cl. 422—64 **3 Claims**



1. In an automatic analytical apparatus having (i) at least one processing station and (ii) a conveyor for conveying. a plurality of cuvettes each having a laterally extending flange, to the at least one processing station, wherein the improvement comprises the conveyor having:

(a) a substantially disc-shaped magazine having an upper surface and an annular side surface, the annular side surface being substantially perpendicular to the upper surface and configured and dimensioned to provide a plurality of cuvette spaces, each cuvette space being positioned to receive a cuvette introduced radially with respect to the magazine so that each cuvette rests adjacent the annular side surface; and

(b) a plurality of retaining means disposed peripherally on the upper surface of the magazine, each retaining means comprising a resilient holding member for securely and releasably holding the laterally extending flange of a cuvette between the upper surface of the magazine and the holding member when the cuvette is adjacent a cuvette space.

5,462,716
CONTAINER FOR RECEIVING AND SEPARATING A FLUID, PREFERABLY BLOOD PLASMA, INTO ITS INGREDIENTS

Niels E. Holm, 10B Julemosevej, DK-3460 Birkerød, Denmark

PCT No. PCT/DK92/00329, § 371 Date May 2, 1994, § 102(e) Date May 2, 1994, PCT Pub. No. WO93/09753, PCT Pub. Date May 27, 1993

PCT Filed Nov. 10, 1992, Ser. No. 240,641

Claims priority, application Denmark, Nov. 11, 1991, 1848/91

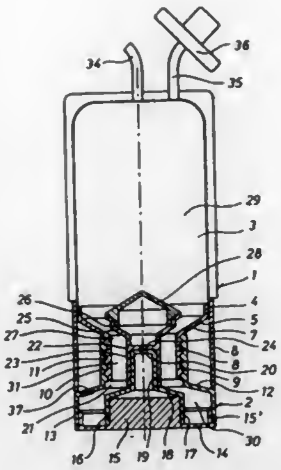
Int. Cl.⁶ B01L *3/00*

U.S. Cl. 422—102 **8 Claims**

1. A container for receiving and separating a fluid into two or more ingredient fractions, comprising:

a first container section and a second container section, said container sections being movable relative to one another so that they can selectively be fully coupled, partially coupled, or separated from one another;

each of said container sections including a fluid receiving chamber and an abutting portion cooperating with the other container section when the container sections are fully or partially coupled;



said container sections adapted to be selectively sealingly engaged when fully or partially coupled, such that a connecting channel between said chambers is formed comprising said abutting portions;

at least one of said container sections and a portion of the other container section being made substantially of rigid material, the rigid container section and the rigid portion of the other container section being adjacent one another when the container sections are fully coupled;

said container sections further comprising respective valve seats proximate said connecting channel and respective valve members;

said valve members comprising portions adapted to cooperate with said valve seats to selectively sealingly close said fluid receiving chambers when said container sections are separated;

said valve members further comprising projections which are mutually abutting at least when said container sections are fully coupled;

said projections dimensioned to maintain the distance between said cooperating portions of said valve members at a value which is greater than the distance between said valve seats when said container sections are fully coupled, and to allow said cooperating portions of said valve members to engage said valve seats to close said fluid receiving chambers before said container sections are separated; and

retaining means for ensuring that said valve members do not engage said valve seats when said container sections are fully coupled.

5,462,717
PROCESSES USING FLUIDIZED SOLIDS AND APPARATUS FOR CARRYING OUT SUCH PROCESSES

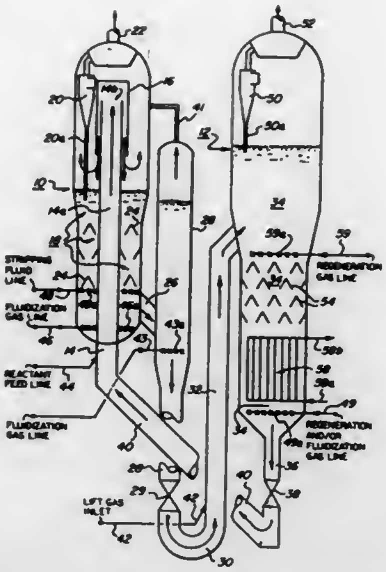
Robert W. Pfeiffer, 3 Hidden Spring La., Rye, N.Y. 10580

Continuation-in-part of Ser. No. 940,025, Sep. 3, 1992, abandoned, which is a continuation-in-part of Ser. No. 746,066, Aug. 12, 1991, abandoned, which is a continuation of Ser. No. 406,350, Sep. 13, 1989, abandoned. This application May 17, 1994, Ser. No. 245,461

Int. Cl.⁶ B01J *8/18;20/34;* **F27B** *15/14;* **F28D** *7/00*

U.S. Cl. 422—146 **23 Claims**

15. In an apparatus for carrying out a chemical reaction in which a reactant feed and particulate solids are contacted under reaction conditions, the establishment of which is facilitated by the presence of the solids, which reaction results in the degradation of the solids, the apparatus comprising (a) a reaction vessel defining a reaction zone; (b) a regeneration vessel defining a regeneration zone; and (c) conduit means connecting the reaction vessel and the regeneration vessel in fluid communication for circulation of fluidized solids between the reaction zone of the reaction vessel and the regeneration zone of the regeneration vessel; the improvement comprising:



the regeneration zone comprises a fluidized solids bed zone divided into at least three distinct, contiguous zones by horizontally-disposed occlusion means defining at least one occlusion zone dimensioned and configured so that a continuous fluidized bed of the particulate solids is maintainable through the at least three zones, the occlusion zone dividing the fluidized solids bed zone into an uppermost fluidized bed zone and at least one lower fluidized bed zone, the uppermost bed zone and the at least one lower bed zone both being contiguous with the occlusion zone, the occlusion zone being dimensioned and configured to permit the passage therethrough of a fluidized bed of the particulate solids; the conduit means being dimensioned and configured to flow degraded solids from the reaction vessel into the uppermost bed zone and to flow regenerated solids from the lower bed zone into the reaction vessel; and the apparatus further comprising heat exchange means disposed within at least one of the lower bed zone and the occlusion zone.

5,462,718

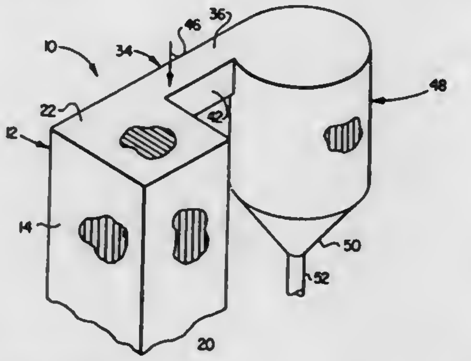
SYSTEM FOR DECREASING NO_x EMISSIONS FROM A FLUIDIZED BED REACTOR

Igbal F. Abdulally, Randolph, N.J., assignor to Foster Wheeler Energy Corporation, Clinton, N.J.

Filed Jun. 13, 1994, Ser. No. 259,083

Int. Cl.^{6} B01J *8/02*

U.S. Cl. 422—171 **11 Claims**



1. A combustion system for decreasing NO_x emissions, comprising:

an enclosure for receiving nitrogen-containing fuel, said enclosure including a first wall having an opening formed in an upper portion thereof;

means for combusting said nitrogen-containing fuel in said enclosure, thereby producing flue gases;

a duct connected at one end to said opening in gas flow communication with said enclosure, said duct having a top wall, a first side wall, and a second side wall; and

means for injecting a reactant through said top wall of said duct for decreasing NO_x levels in flue gases passing from said enclosure and through said duct, said means for injecting a reactant being disposed to inject said reactant nearer to said one end of said duct than to the other end thereof, and nearer to said first side wall of said duct than to said second side wall of said duct.

5,462,719

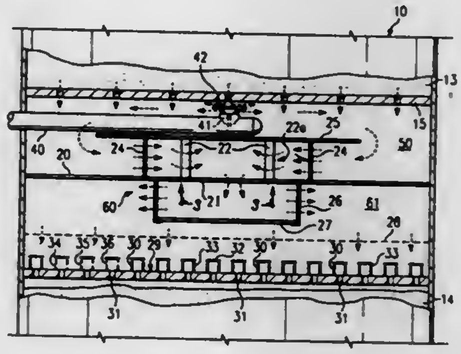
METHOD AND APPARATUS FOR MIXING AND DISTRIBUTING FLUIDS IN A REACTOR

Michael J. Pedersen, Irvine; Vijay R. Sampath, Brea, and James F. Litchfield, South Pasadena, all of Calif., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jun. 8, 1994, Ser. No. 255,583

Int. Cl.^{6} B01F *5/06*

U.S. Cl. 422—195 **14 Claims**



10. A method of mixing reactants in a reactor column, said method comprising:

flowing a first reactant vertically downward into a mixing zone within a reactor column;

flowing a second reactant radially outward into said mixing zone to perpendicularly intercept the down flowing first reactant;

flowing said first and second reactants radially inward through a first set of openings to further mix said reactants due to the resulting turbulence;

flowing said mixed reactants inwardly through a nozzle which comprises vanes mounted on a divider plate within said mixing zone and which imparts a swirling action thereto; and

flowing said further mixed reactants through said divider plate and radially outward through a second set of openings to complete the mixing of the reactants.

5,462,720

PROCESS FOR BIOLIXIVIATING COPPER SULFIDES BY INDIRECT CONTACT WITH SEPARATION OF EFFECTS

Juan L. B. Aragonés, Madrid, Spain, assignor to Iskay Servicios Metalurgicos Srl., Madrid, Spain

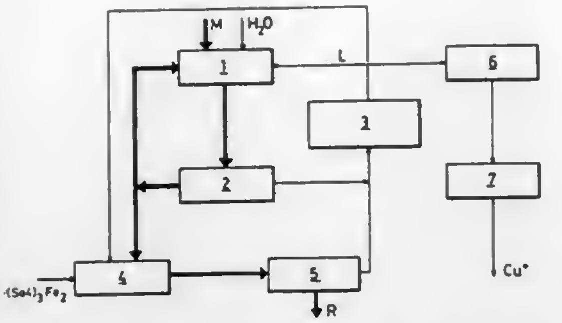
Filed Jan. 21, 1994, Ser. No. 184,038

Int. Cl.^{6} C22B *15/00*

U.S. Cl. 423—27 **14 Claims**

1. A process for biolixiviating minerals from copper sulfides or flotation concentrates thereof, said method comprising the steps of:

(a) subjecting said copper sulfides or flotation concentrates thereof to a chemical lixiviation, said chemical lixiviation being performed in two stages,



- (i) a first stage comprising primary lixiviation in pulp at a temperature ranging between 5° and 40° C. in a primary lixiviation reactor with mechanical agitation, and
- (ii) a second stage comprising secondary lixiviation in pulp at a temperature ranging between 50° and 90° C. in a secondary lixiviation reactor with mechanical agitation,
  - said primary lixiviation reaction comprising treating said copper sulfides or flotation concentrates with a lixiviating agent comprising ferric ions at an initial concentration ranging between 5 and 15 g/L and resulting in the formation of a mineral pulp comprising said minerals and a primary lixiviation liquor which comprises extracted copper and ferrous ions produced by reduction of said lixiviating agent, a fraction of the pulp from said primary lixiviation being recirculated to said first stage,
  - and said secondary lixiviation comprising treating the non-recirculated fraction of pulp from said primary lixiviation with a lixiviating agent comprising ferric ions at an initial concentration ranging between 20 and 70 g/L and resulting in the formation of a pulp comprising a solid residue and a secondary lixiviation liquor which comprises the extracted copper and the ferrous ions;
- (b) separating said primary lixiviation liquor from said mineral pulp and transporting the separated primary lixiviation liquor to a biooxidation vessel;
- (c) separating said secondary lixiviation liquor from the pulp comprising said solid residue, and transporting the separated secondary lixiviation liquor to a biooxidation vessel and recirculating the pulp comprising the solid residue to said secondary lixiviation reactor;
- (d) regenerating said lixiviating agent by contacting said primary and secondary lixiviation liquor, containing ferrous ions, with a ferrooxidant microorganism immobilized on a solid support in said biooxidation vessel, said contacting resulting in conversion of said ferrous ions to ferric ions, thereby producing a regenerated lixiviation agent comprising said extracted copper and said ferric ions; and
- (e) returning said regenerated lixiviation agent to said primary and secondary lixiviation reactors.

5,462,721

HYDROGEN SULFIDE SCAVENGING PROCESS

Russell Pounds, Richmond, and Doyle Cherry, Kemah, both of Tex., assignors to Crescent Holdings Limited, Kemah, Tex.

Continuation-in-part of Ser. No. 295,270, Aug. 24, 1994, abandoned. This application Dec. 7, 1994, Ser. No. 350,635

Int. Cl.^{6} B01D *53/48;53/52;* **C10G** *29/20*

U.S. Cl. 423—226 **11 Claims**

1. A method for selectively reducing the levels of hydrogen sulfide and organic sulfides present in a gas, a liquid, or a mixture thereof, comprising the step of contracting the sulfides with a composition consisting essentially of the reaction mixture formed from the reaction between;

- (a) a dialdehyde having two carbonyl groups; and
- (b) an alkanolamine having at least one hydrogen atom bonded directly to a nitrogen atom, wherein the amounts of dialdehyde and alkanolamine provide between about 1.5 and about 3 equivalents of hydrogen atoms bonded directly to a nitrogen atom in the alkanolamine for every equivalent of carbonyl groups in the dialdehyde, and wherein the reaction mixture is substantially free of triazines.

5,462,722

CALCIUM PHOPHATE CACIUM SULFATE COMPOSITE IMPLANT MATERIAL

Sung-Tsuen Liu, 29 Landing, Laguna Niguel, Calif. 92677, and Harvey H. Chung, 43 Via Costa Verde, Rancho Palos Verdes, Calif. 90274

Filed Apr. 17, 1991, Ser. No. 687,592

Int. Cl.^{6} C01B *15/16;25/26;* **C01F** *11/46;* **A61F** *2/28*

U.S. Cl. 423—311 **14 Claims**

1. A method for converting a particle of calcium sulfate, having a desired size and shape, into a particle of one of a calcium phosphate and calcium phosphate-calcium sulfate composite for use in hard tissue replacement, comprising:

- preparing a particle of calcium sulfate having a desired size and shape;
- preparing an aqueous alkaline solution of a phosphate salt having a pH of at least 10;
- preheating and maintaining said aqueous alkaline solution temperature to at least 70° C. or higher; and
- adding said particle of calcium sulfate to said preheated aqueous alkaline solution and permitting reaction to occur for a time period effective to effectuate the substitution of at least some of the calcium sulfate of said particle with calcium phosphate, and thereby to obtain a product selected from a fully converted product of calcium phosphate and a partially converted product of a calcium phosphate-calcium sulfate composite.

5,462,723

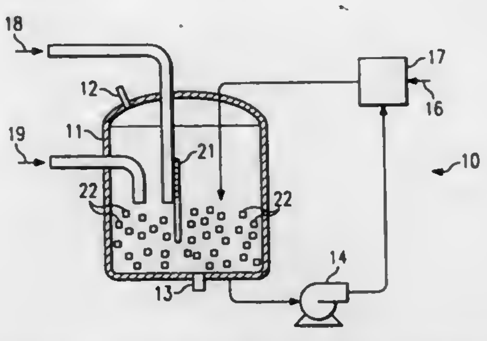
AQUEOUS HYDRIDES AND METHOD OF MANUFACTURE THEREFORE

William W. Berry, Lakeland, Fla., assignor to Coralplex, Inc., Dallas, Tex.

Continuation of Ser. No. 131,785, Oct. 1, 1993, abandoned. This application Feb. 21, 1995, Ser. No. 391,489

Int. Cl.^{6} C01B *6/00;33/04*

U.S. Cl. 423—347 **12 Claims**



1. A method of manufacturing aqueous hydrides, comprising the steps of:

- placing in a tank at least twice an amount of metal required to produce a predetermined amount of reaction product;
- introducing a predetermined quantity of water into the tank in such a manner as to provide intimate contact with the metal;
- gradually adding a predetermined amount of an alkali hydroxide to the metal and water, thereby forming a reaction mixture and initiating a reaction, wherein the alkali hydroxide comprises a portion of the reaction mixture in the range of 25–40% by weight;
- maintaining a temperature of the reaction mixture in a range of 90°–100° C. and a specific gravity of the reaction mixture in a range of 1.6–1.7 until the reaction goes to completion; and

cooling the reaction mixture to a temperature of approximately 50°–60° C. to form an aqueous hydride having a specific gravity in a range of 1.6–1.7 after cooling of the reaction mixture.

5,462,724
SENSITIZING AGENTS FOR USE IN BORON NEUTRON CAPTURE THERAPY

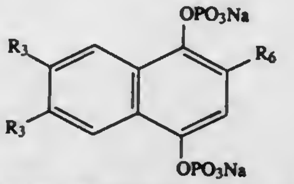
Raymond F. Schinazi, 1524 Regency Walk Dr., Decatur, Ga. 30033, and Dennis C. Liotta, 251 Montrose Dr., McDonough, Ga. 30253-4243

Division of Ser. No. 840,093, Feb. 24, 1992, Pat. No. 5,405,598. This application Jan. 30, 1995, Ser. No. 380,520

Int. Cl.^{6} A61K *31/69;* **C07F** *9/12*

U.S. Cl. 424—1.77 **7 Claims**

1. A compound having the formula II


(II)

R_3 and R_4 are each, independently, —H, —B(OH)$_2$, —B(OR$_6$)$_2$ (wherein R_6 is a C_{1-4} alkyl), or a carboranyl group —$B_{10}H_{10}C_2R_8$, wherein R_8 is —H, —OH, —CH$_2$OH, —CH$_2$X (wherein X is F, Cl, Br, or I) or —$B_9C_2H_{12}^-$ (nidocarborane anion), provided that one of R_3 and R_4 is —H and the other of R_3 and R_4 is not —H, and pharmaceutically acceptable salts thereof.

5,462,725
2-PYRIDYLMETHYLENEPOLYAZAMACROCYCLOPHOSPHONIC ACIDS, COMPLEXES AND DERIVATIVES THEREOF, FOR USE AS CONTRAST AGENTS

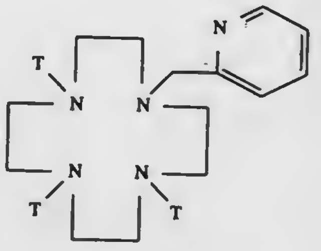
Garry E. Kiefer, Lake Jackson, and Won D. Kim, Richardson, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed May 6, 1993, Ser. No. 57,588

Int. Cl.^{6} A61K *49/00;* **A61B** *5/055;* **C07D** *401/06*

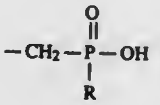
U.S. Cl. 424—9.363 **13 Claims**

1. 2-Pyridylmethylenepolyazamacrocyclic compounds of the formula

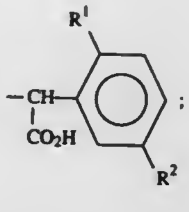

(I)

wherein:

T is independently —CH$_2$—COOH,


$-CH_2-\overset{\overset{\displaystyle O}{\|}}{\underset{\underset{\displaystyle R}{|}}{P}}-OH$

or


;

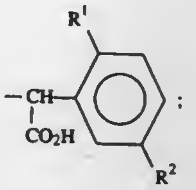
where:

R is OH, C_1–C_5 alkyl or —O—(C_1–C_5 alkyl);

R^1 is OH or OCH$_3$;

R^2 is NO$_2$, NH$_2$, isothiocyanato, semicarbazido, thiosemicarbazido, maleimido, bromoacetamido or carboxyl;

with the proviso that only one T moiety can be


;

where R^1 and R^2 are defined as before; and

with the proviso that at least one T moiety is —CH$_2$—P(O)ROH where R is —O—(C_1–C_5 alkyl); or pharmaceutically-acceptable salts thereof.

5,462,726
METHOD OF INHIBITING SIDE EFFECTS OF SOLVENTS CONTAINING RICINOLEIC ACID OR CASTOR OIL OR DERIVATIVES THEREOF EMPLOYING A THROMBOXANE A$_2$ RECEPTOR ANTAGONIST AND PHARMACEUTICAL COMPOSITIONS CONTAINING SUCH SOLVENTS

Nicholas J. Lodge, Hamilton Square, N.J., assignor to Bristol-Myers Squibb Company, Princeton, N.J.

Filed Dec. 17, 1993, Ser. No. 168,348

Int. Cl.^{6} A61K *49/00*

U.S. Cl. 514—558 **10 Claims**

1. A method for inhibiting, treating or reducing unwanted side effects caused by a pharmaceutical solvent containing ricinoleic acid or castor oil or a derivative thereof, wherein said derivative is selected from the group consisting of Cremopor, Cremophor EL, polyoxl 35 castor oil, polyethoxylated castor oils, triricinoleate ester of ethoxylated glycerol with macrogol ricinoleate and the corresponding free glycerols, which comprises employing a thromboxane A$_2$ receptor antagonist in conjunction with such solvent.

5,462,727
COMPOSITION FOR INHIBITION OF CORROSION IN GALVANIZED STEEL CANS

Steven J. Engler, Coon Rapids, Minn., assignor to Dowbrands L.P., Indianapolis, Ind.

Filed Feb. 2, 1993, Ser. No. 12,210

Int. Cl.^{6} A61K *9/12;* **C23F** *11/00*

U.S. Cl. 424—45 **16 Claims**

1. A composition for inhibiting corrosion in a galvanized steel can containing an aqueous composition, consisting essentially of from about 0.05% to about 5.0% of an alkyl benzoate wherein the alkyl group contains 8 to 20 carbon atoms, and from about 0.01% to about 5.0% of an organic borate, based on the total weight of the composition.

5,462,728
PHARMACEUTICAL COMPOSITIONS

Izhak Blank, 4 Simtat Arnon, Kiryat Ono 55000, and Alon Blank, 22a Tamar Street, Haifa 34325, both of, Israel

Filed Apr. 5, 1994, Ser. No. 222,881

Int. Cl.^{6} A61K *7/16;9/06*

U.S. Cl. 424—49 **6 Claims**

1. A composition for the treatment and for the prevention of gingivitis, periodentitis and other afflictions of the oral cavity, said

composition comprising solutions and/or gels of a water insoluble or water swellable copolymer of vinyl acetate and a hydrophilic comonomer selected from the group consisting of itaconic, acrylic, methacrylic, fumaric and maleic acid, a physiologically acceptable solvent, and a therapeutically active agent selected from the group consisting of bisguanidines and physiologically acceptable salts thereof, wherein said hydrophilic comonomers constitute from 0.5 to 8% of the copolymer, and wherein upon contact of said solution or gel with the aqueous environment of the oral cavity, a bioadhesive coating of copolymer containing said active agent is precipitated in situ, which retains its activity for a period of hours.

5,462,729

HOOF AND NAIL CONDITIONER

Jack Vlasblom, Dunedin, Fla., assignor to Citra Science Ltd., Largo, Fla.

Filed Aug. 9, 1994, Ser. No. 287,827

Int. Cl.^{6} A61K *7/04*

U.S. Cl. 424—61 **21 Claims**

1. A hoof and nail conditioner, consisting of:
(2,5-dioxo-4-imidazolidinyl) urea;
pantothenol;
ethoxylated lanolin;
hydrolyzed keratin protein;
sorbitan monolaurate;
an antimicrobial preservative; and
water.

5,462,730

CROSS-LINKED QUATERNARY AMONONIUM DERIVATIVES OF POLY(N, N-DIALKYLALLYL) AMMONIUM POLYMERS

Fergus McTaggart, Wilmslow; Denis Pemberton, Stockport, and Graham J. Smith, Macclesfield, all of, United Kingdom, assignors to Imperial Chemical Industries PLC, London, England

Continuation of Ser. No. 804,131, Dec. 6, 1991, abandoned. This application Jun. 1, 1994, Ser. No. 252,521

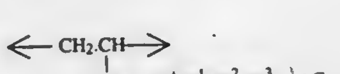
Claims priority, application United Kingdom, Dec. 4, 1990, 9026616; May 10, 1991, 9110180

Int. Cl.^{6} A61K *31/785;* C08F *8/02;126/02;* C08J *3/24*

U.S. Cl. 424—78.35 **4 Claims**

1. A pharmaceutical composition which comprises: an insoluble swellable polymeric allylammonium derivative D1 comprising in random order:

(i) at least 10 mole percent of quaternary propylammonium structural units of formula I:

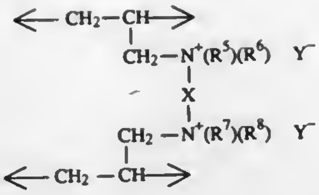


$$\begin{array}{l}\leftarrow CH_2.CH\rightarrow \\ \qquad\ \ | \\ \qquad\ \ CH_2-N^+(R^1)(R^2)(R^3)\ \ Y^-\end{array}$$

(I)

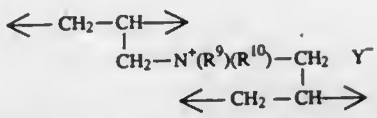
wherein one of R^1, R^2 and R^3 is (1-16C)alkyl, (4-12C)cycloalkyl or phenyl-(1-4C)alkyl, the latter phenyl moiety optionally bearing one or two substituents independently selected from halogeno, (1-4C)alkyl and (1-4C)alkoxy; another of R^1, R^2 and R^3 is (1-4C)alkyl; and the other of R^1, R^2 and R^3 is (1-4C)alkyl optionally bearing a carbamoyl substituent, or is (2-4C)alkyl bearing a hydroxy substituent on other than an α-carbon atom; and Y is a physiologically acceptable anion;

(ii) about 0.5 to 10 mole percent of cross-linking structural units of formula IIa and/or IIb:



$$\begin{array}{l}\leftarrow CH_2-CH\rightarrow \\ \qquad\quad | \\ \qquad\quad CH_2-N^+(R^5)(R^6)\ \ Y^- \\ \qquad\qquad\qquad | \\ \qquad\qquad\qquad X \\ \qquad\qquad\qquad | \\ \qquad\quad CH_2-N^+(R^7)(R^8)\ \ Y^- \\ \qquad\quad | \\ \leftarrow CH_2-CH\rightarrow\end{array}$$

(IIa)

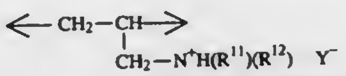


$$\begin{array}{l}\leftarrow CH_2-CH\rightarrow \\ \qquad\quad | \\ \qquad\quad CH_2-N^+(R^9)(R^{10})-CH_2\ \ Y^- \\ \qquad\qquad\qquad\qquad\qquad\quad | \\ \qquad\qquad\qquad \leftarrow CH_2-CH\rightarrow\end{array}$$

(IIb)

wherein R^5, R^6, R^7 and R^8 are independently hydrogen or one of the values of R^1, R^2 and R^3 defined above; one of R^9 and R^{10} has one of the values of R^1, R^2 and R^3 defined above; Y has the meaning defined above; and X is a cross-linking group; and

(iii) the remainder of structural propylamine units of formula III:



$$\begin{array}{l}\leftarrow CH_2-CH\rightarrow \\ \qquad\quad | \\ \qquad\quad CH_2-N^+H(R^{11})(R^{12})\ \ Y^-\end{array}$$

(III)

wherein R^{11} and R^{12} are independently hydrogen or one of the values of R^1, R^2 and R^3 defined above; and Y has the meaning defined above; said derivative D1 having the property of swelling by between about 2 and 200 times in volume in at least one of water, 0.15M aqueous sodium chloride solution, and ethanol;

together with a pharmaceutically acceptable diluent or carrier.

5,462,731

USE OF IL-6 FOR THE TREATMENT OF CHRONIC LYMPHOCYTE LEUKEMIA (CLL) AND B-CELL LYMPHOMAS

Dan Aderka, Holon; Yasmin Maor, Raanana; David Wallach, and Michel Revel, both of Rehovot, all of, Israel, assignors to Yeda Research and Development Company Ltd., Rehovot, Israel

Filed Oct. 20, 1992, Ser. No. 963,313

Claims priority, application Israel, Jan. 20, 1991, 99803

Int. Cl.^{6} A61K *45/05;37/00*

U.S. Cl. 424—85.2 **7 Claims**

1. A method for the treatment of chronic lymphocytic leukemia (CLL) in a patient, comprising administering to said patient a therapeutically effective amount of interleukin-6 (IL-6), a salt, a functional derivative, a mutein, an active fraction, or any combination thereof.

5,462,732

METHOD OF PROTECTING PLANTS FROM INSECTS BY APPLYING GYPSY MOTH VIRUS WITH ENHANCED POLYHEDRA PRODUCTION STABILITY

James M. Slavicek, Dublin, and Melissa J. Mercer, Delaware, both of Ohio, assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 290,634, Aug. 15, 1994, Pat. No. 5,420,031, which is a continuation of Ser. No. 15,961, Feb. 8, 1993, abandoned. This application Jan. 25, 1995, Ser. No. 378,227

Int. Cl.^{6} A01N *63/00*

U.S. Cl. 424—93.2 **3 Claims**

1. A method for protecting plants from insects against which LdMNPV is toxic, said method comprising applying to such

insects or insect habitat an insecticidally effective amount of a virus designated ATCC VR2396 deposited at the American Type Culture Collection.

5,462,733

IMMUNE SYSTEM MODULATION USING PSORALENS ACTIVATED WITH VISIBLE LIGHT

Richard L. Edelson, Westport, and Francis P. Gasparro, Hamden, both of Conn., assignors to Yale University, New Haven, Conn.

Filed Feb. 4, 1993, Ser. No. 13,831

Int. Cl.^{6} A61K *35/14;35/26*

U.S. Cl. 424—93.71 **23 Claims**

13. A method for modifying the immune system response of a mammal to an antigen, comprising the steps of:

(a) withdrawing a suspension of leukocyte cells containing cellular nucleic acid molecules from a mammal that has been exposed to the antigen;

(b) contacting the suspension of leukocyte cells containing cellular nucleic acid molecules with a plurality of psoralen molecules to form a psoralen-cell suspension;

(c) extracorporeally irradiating the psoralen-cell suspension with visible light having a wavelength greater than about 420 nm to form a plurality of cellular nucleic acid-psoralen photoadducts including monoadducts and crosslinks, wherein the ratio of the monoadducts to crosslinks is at least about 10 to 1;

(d) placing the irradiated psoralen-cell suspension in a pharmaceutically acceptable carrier to form a pharmaceutical preparation for modifying the immune response; and

(e) administering the pharmaceutical preparation to the mammal so as to modify the immune system response of the mammal to the antigen.

5,462,734

BOVINE HERPESVIRUS VACCINE AND METHOD OF USING SAME

Geoffrey J. Letchworth, III, Madison, and Barbara A. Israel, Mount Horeb, both of Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Continuation of Ser. No. 607,794, Nov. 2, 1990, abandoned. This application Mar. 22, 1993, Ser. No. 35,558

Int. Cl.^{6} A61K *39/245;* **C07K** *14/03*

U.S. Cl. 424—229.1 **6 Claims**

1. A method for the induction of acquired immunity to bovine herpesvirus 1 (BHV1) comprising the steps of

(a) introducing a quantity of a first vaccination formulation so as to induce a systemic immunological response, the first vaccination formulation including glycoprotein gI from the BHV1 capable of causing a systemic immune response and a carrier suitable for parenteral administration, the first formulation being substantially free of viral DNA; and

(b) exposing the mucosal membranes to a second vaccination formulation so as to induce an immunological response in the mucosal tissues, the second vaccination formulation including glycoprotein gI from BHV1 capable of causing a mucosal immune response, an adjuvant comprising the B subunit from cholera toxin effective to increase the mucosal immune response to the glycoprotein, and a carrier suitable for application to mucosal tissues, the second formulation being substantially free of viral DNA.

5,462,735

PASTEURELLA HAEMOLYTICA SUBUNIT VACCINE CONTAINING CAPSULAR POLYSACCHARIDE AND MURAMYL DIPEPTIDE

Kim A. Brogden, Boone, Iowa, and Louis Chedid, Tampa, Fla., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Jun. 10, 1993, Ser. No. 75,064

Int. Cl.^{6} A61K *39/102;39/39*

U.S. Cl. 424—255.1 **16 Claims**

1. A vaccine composition comprising *Pasteurella haemolytica* capsular polysaccharide and muramyl dipeptide in pharmaceutically acceptable carrier or vehicle.

5,462,736

CRYSTAL CLEAR COSMETIC STICK COMPOSITION

Dawn M. Rech, Lake Hopatcong, and Morton L. Barr, Rockaway, both of N.J., assignors to The Mennen Company, Morristown, N.J.

Filed Jun. 2, 1993, Ser. No. 70,622

Int. Cl.^{6} A61K *7/32*

U.S. Cl. 424—401 **48 Claims**

1. A clear cosmetic stick composition comprising:

(a) a soap gelling agent;

(b) at least two aliphatic polyhydric alcohols, which are solvents for the soap gelling agent, wherein the at least two aliphatic polyhydric alcohols include a first aliphatic polyhydric alcohol and a second aliphatic polyhydric alcohol, the first aliphatic polyhydric alcohol having a first molecular weight and the second aliphatic polyhydric alcohol having a second molecular weight, the first molecular weight always being larger than the second molecular weight;

(c) a propoxylated ether that is a further solvent for the soap gelling agent, the propoxylated ether being PPG-n alkyl ether, where the alkyl group is straight chain or branched and has 4–9 carbon atoms, and where n is 2–20, the propoxylated ether having a solubility in water of at most 5% by weight, of the weight of water for dissolving the propoxylated ether;

(d) water, in an amount of 2–30% by weight, of the total weight of the composition; and

(e) a clarifying agent, the clarifying agent including (i) a propoxylated fatty alcohol, and (ii) a water-soluble, N-substituted aliphatic fatty acid amide surfactant, the water-soluble, N-substituted aliphatic fatty acid amide surfactant being included in an amount of 2–8% by weight, of the total weight of the composition.

5,462,737

CHEMICAL COMPOSITION FOR LIPSTICK SEALANT

D. Russell Pfleuger, 3 Cavalier, Laguna Niguel, Calif. 92677

Filed May 23, 1994, Ser. No. 247,713

Int. Cl.^{6} A61K *7/025*

U.S. Cl. 424—401 **8 Claims**

1. A composition for a lipstick sealant which forms a water-insoluble, transparent, flexible film preventing the transfer of lipstick to objects coming into contact with the lips, comprising at least 5% by weight of ethyl cellulose, no more than 4% by weight of essentials oils, the balance being ethanol, and wherein the substitution of ethoxyl groups is from 2.41 to 2.51 per anhydroglucose unit.

5,462,738

COPPER HYDROXIDE DRY FLOWABLE BACTERICIDE/FUNGICIDE AND METHOD OF MAKING AND USING SAME

James H. LeFiles, Valdosta; Evelyn J. Taylor, Hahira, and Mark A. Crawford, Valdosta, all of Ga., assignors to Griffin Corporation, Valdosta, Ga.

Continuation of Ser. No. 928,148, Aug. 11, 1992, Pat. No. 5,298,253, which is a continuation of Ser. No. 591,288, Oct. 1, 1990, abandoned. This application Mar. 22, 1994, Ser. No. 215,510

Int. Cl.^{6} A01N *59/20*

U.S. Cl. 424—409 **15 Claims**

1. A method of producing a dry flowable bactericide/fungicide for agricultural uses which is substantially nonphytotoxic and which has improved biological activity and rainfastness comprising the steps of:

forming an aqueous slurry by combining with water:

between approximately 5% and 20% by weight (based on the total weight of all dry ingredients) of a first dispersant of lignin sulfonate;

between approximately 0% and 5% by weight (based on the total weight of all dry ingredients) of a second dispersant for bentonite clay;

between approximately 40% and 80% by weight (based on the total weight of all dry ingredients) phosphate stabilized cupric hydroxide; and

between approximately 6% and 30% by weight (based on the total weight of all dry ingredients) bentonite clay;

mixing said slurry to form a substantially homogeneous slurry; and

drying said slurry to thereby form a free flowing granular material having less than 10% moisture, said granular material being dispersible in aqueous medium.

5,462,739

MICRODELIVERY DEVICE AND METHOD FOR ENHANCED DRUG ADMINISTRATION TO THE EYE

Jacov Dan, Hod Hasharon, and Arieh Yaron, Rehovot, both of, Israel, assignors to Yeda Research and Development Co., Ltd., Rehovot, Israel

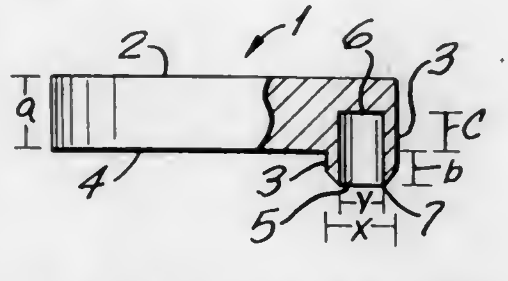
PCT No. PCT/US92/09878, § 371 Date Nov. 2, 1994, § 102(e) Date Nov. 2, 1994, PCT Pub. No. WO93/09829, PCT Pub. Date May 27, 1993

PCT Filed Nov. 16, 1992, Ser. No. 244,248

Claims priority, application Israel, Nov. 21, 1991, 100112

Int. Cl.^{6} A61F *2/00*

U.S. Cl. 424—427 **10 Claims**



1. A device for pinpoint application of micro-quantities of a pharmaceutical composition to a preselected portion of the outer hard coat of the eye,

the device comprising a micro-container with fixation means for reversible attachment of said micro-container to the outer hard coat of the eye adjacent to the preselected portion thereof,

said micro-container comprising a pharmaceutical composition delivery bore whose aperture is adapted to contact the preselected portion of the outer hard coat of the eye so as to expose only the preselected portion thereof to the pharmaceutical composition.

5,462,740

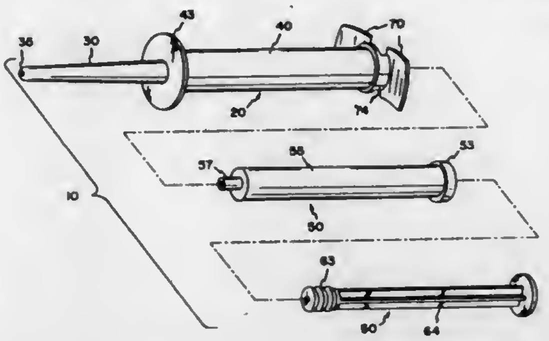
RECTALLY-ADMINISTERED, EPILEPTIC-SEIZURE-INHIBITING COMPOSITION

Kenneth L. Evenstad; Victoria A. O'Neill, both of Wayzata, and Thomas R. Gorham, Brooklyn Park, all of Minn., assignors to Athena Neurosciences, Inc., San Francisco, Calif.

Filed Sep. 17, 1993, Ser. No. 122,685

Int. Cl.^{6} A61F *9/02;* **A61K** *47/38*

U.S. Cl. 424—436 **8 Claims**



1. A viscous, epileptic-seizure-inhibiting composition comprising:

(a) about 0.1–2.5 wt-% of the total composition of an anti-epileptic agent;

(b) a buffer system in an amount effective to maintain the pH of the composition at about 5.5–7.5;

(c) about 1–10 wt-% of a cellulose ether thickener to impart a viscosity to the composition so that it is suitable for administration by rectal injection to a human patient; and

(d) about 25–95 wt-% solvent.

5,462,741

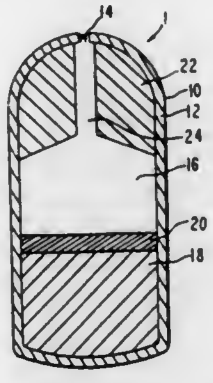
HIGH AGENT LOADED CONTROLLED RELEASE DISPENSER

John P. Carr, Sunnyvale; Steven D. Larsen, Dublin, and James B. Eckenhoff, Los Altos, all of Calif., assignors to Alza Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 926,614, Aug. 6, 1992, abandoned. This application Apr. 28, 1994, Ser. No. 234,457

Int. Cl.^{6} A61K *9/00*

U.S. Cl. 424—438 **15 Claims**



1. A delivery system comprising: a housing pervious to fluid; a composition comprising 50 wt % to 80 wt % of a beneficial agent and 20 wt % to 50 wt % of a glyceride; and, exit means in the housing for releasing the composition from the delivery system; and wherein the composition is characterized by: the beneficial agent is heated to a temperature approximately its melting temperature prior to blending with the glyceride heated to temperature approximating its melting temperature to provide the composition in the delivery system.

5,462,742

GEL-FORMING LIQUID DIETARY FIBRE COMPOSITION

Conny Bogentoft, Vällingby; Anders Carlsson, Stockholm, both of, Sweden, and Janet Tomlin, Sheffield, United Kingdom, assignors to Pharmacia AB, Sweden

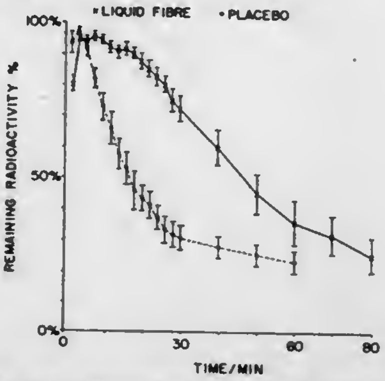
PCT No. PCT/SE91/00730, § 371 Date Jul. 22, 1993, § 102(e) Date Jul. 22, 1993, PCT Pub. No. WO92/09212, PCT Pub. Date Jun. 11, 1992

PCT Filed Oct. 30, 1991, Ser. No. 64,103

Claims priority, application Sweden, Nov. 22, 1990, 9003713

Int. Cl.^{6} A61K *9/00;9/08;31/70*

U.S. Cl. 424—439 **7 Claims**



1. A dietary fibre composition comprising a water-soluble, nonionic cellulose ether having a cloud point not higher than 35° C., a charged surfactant, a nonionic, low-molecular weight compound in an effective isotonic amount, and optional additives in water, the ratio of surfactant to cellulose ether being 1:5 to 1:25 by weight and the concentration of cellulose ether and surfactant being up to 2% by weight, which composition is a liquid solution at room temperature and a gel in the gastrointestinal tract at body temperature.

5,462,743

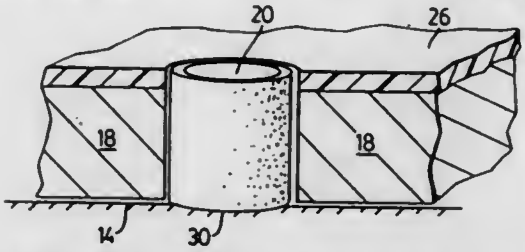
SUBSTANCE TRANSFER SYSTEM FOR TOPICAL APPLICATION

Josephine S. Turner, Kettleby; D. Gary Murray, Willowdale; John D. Zuccolin, Stouffville, and Ruey S. Li, Thornhill, all of, Canada, assignors to Medipro Sciences Limited, Toronto, Canada

Continuation-in-part of Ser. No. 969,721, Oct. 30, 1992, abandoned. This application Aug. 6, 1993, Ser. No. 102,786

Int. Cl.^{6} A61F *13/02*

U.S. Cl. 424—448 **30 Claims**



1. A topically applicable substance transfer device for transdermal or topical transfer of substances to and from a living body, said device having an inner surface for body contact, and further comprising:

a layer of skin compatible adhesive having an inner surface for body contact;

a plurality of channels extending through the layer of adhesive, each said channel having an inner opening at the inner surface of the device substantially completely surrounded by adhesive;

substance depots in liquid communication with the inner openings of at least some of said channels and adapted to transfer substance to and from said openings, said substance depots having inner surfaces which protrude beyond the inner surface of the adhesive layer;

said inner surface of the device being comprised of discrete areas constituted respectively by the inner openings of said channels and by the inner surface of said adhesive layer;

and said channels being lined with barrier material to impede diffusion between the substance depots and the adhesive.

5,462,744

TRANSDERMAL SYSTEM FOR THE ADMINISTRATION OF PHARMACOLOGICAL COMPOUNDS UNDER PH-CONTROLLED CONDITIONS

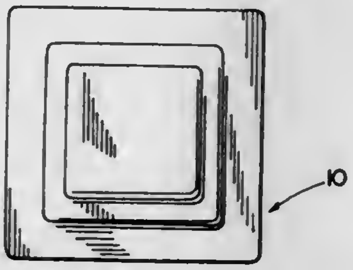
Arun R. Gupte, Ingelheim am Rhein; Uwe Rohr, Gau Algesheim, and Bernd Zierenberg, Bingen, all of, Germany, assignors to Boehringer Ingelheim KG, Ingelheim am Rhein, Germany

Continuation of Ser. No. 741,498, Jul. 24, 1992, abandoned. This application Nov. 8, 1993, Ser. No. 148,796

Claims priority, application Germany, Nov. 29, 1990, 39 39 703.3

Int. Cl.^{6} A61F *13/00*

U.S. Cl. 424—448 **4 Claims**



4. A method of administering transdermally a pharmacologically active substance selected from the group consisting of physostigmine, clonidine, fentanyl, ephedrine, nicotinicacidamide, clenbuterol, pramipexol, lisuride, terbutaline, salbutamol, hexoprenaline, insulin, vasopressin and atrial natriuretic peptide (ANP) which comprises maintaining the pH value of the skin surface substantially constant within a predetermined range which includes the range over which the flux rate of the active substance is at a maximum by contacting the skin surface with a pharmacologically acceptable additive comprising a weak base, a weak acid, organic or inorganic salts which form a buffering system, or mixtures thereof, which additive provides a pH of from 3 to 10.

5,462,745

SUBSATURATED TRANSDERMAL THERAPEUTIC SYSTEM HAVING IMPROVED RELEASE CHARACTERISTICS

David J. Enscore, Sunnyvale; Patricia S. Campbell, Palo Alto; James L. Osborne, Mountain View; Melinda K. Smart, Sunnyvale, and Su I. Yum, Los Altos, all of Calif., assignors to Alza Corporation, Palo Alto, Calif.

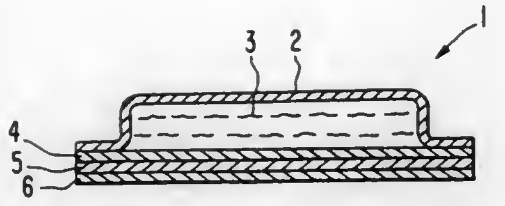
Continuation of Ser. No. 80,645, Jun. 18, 1993, Pat. No. 5,342,623, which is a continuation-in-part of Ser. No. 906,730, Sep. 12, 1986, Pat. No. 5,282,380. This application Aug. 30, 1994, Ser. No. 297,739

The portion of the term of this patent subsequent to Aug. 30, 2011, has been disclaimed.

Int. Cl.^{6} A61F *13/02*

U.S. Cl. 424—448 **10 Claims**

1. In a transdermal delivery device for administering an agent through the skin of a subject over a predetermined administration period, said device comprising an agent reservoir having an agent which is a solvent for medically acceptable adhesives dissolved therein at a concentration less than saturation, said reservoir being



maintained in drug transmitting contact with the skin by means of the adhesive properties of the agent releasing surface of said device; the improvement wherein said agent is dissolved in said reservoir at:

a) concentration less than saturation and at an activity that is less than that at which said adhesive surface loses its adhesive properties; and

b) an initial equilibrated agent loading that is sufficient to prevent the activity of said agent in said reservoir from decreasing by more than 75% during said administration period.

5,462,746

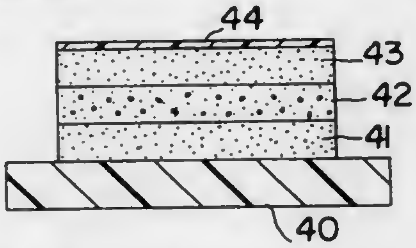
PATCH FOR TRANSDERMAL ADMINISTRATION OF VOLATILE PHARMACEUTICALLY ACTIVE INGREDIENTS OF CHEMICALLY BASIC NATURE AND A PROCESS FOR PREPARATION

Karin Wolter, Melsbach; Walter Müller, Neuwied; Günter Simon, Hillesheim; Christa Nalbach, Leutesdorf, and Hans-Rainer Hoffmann, Neuwied, all of, Germany, assignors to LTS Lohmann Therapie-Systeme GmbH & Co. KG, Neuwied, Germany

Continuation of Ser. No. 969,895, Nov. 2, 1992, abandoned. This application Apr. 11, 1994, Ser. No. 226,236

Int. Cl.^{6} A61L *15/00*

U.S. Cl. 424—449 **27 Claims**



1. A patch for transdermal administration of volatile pharmaceutically active ingredients having a chemically basic nature, said patch comprising the following layers:

(a) a pressure-sensitive adhesive composition having distributed therein a physiologically acceptable salt of said volatile active ingredient;

(b) a pressure-sensitive adhesive composition having distributed therein an amino-group-containing compound to liberate the free base from said salt, said pressure-sensitive adhesive composition being identical to or different from the pressure-sensitive adhesive composition in (a);

(c) a backing layer impermeable to diffusable ingredients of (a) and (b); and

(d) a release liner impermeable to diffusable ingredients of (a) and (b);

wherein:

(i) layer (a) or layer (b), whichever is in contact with layer (d), having a tack sufficient for affixing the patch to the skin;

(ii) any part of layer (b) positioned between layer (a) and layer (d) being permeable to the volatile active ingredient and the salt thereof; and

(iii) layer (a) and layer (b) being laminated to one another and, at the time of lamination, said salt being contained only in layer (a) and said amino-group-containing compound being contained only in layer (b).

5,462,747

PHARMACEUTICAL SUSTAINED RELEASE MATRIX

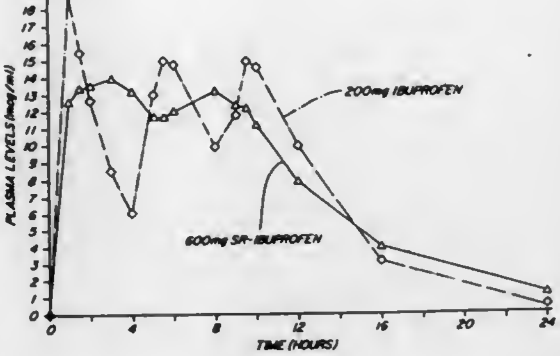
Galen W. Radebaugh, Maple Glen; Thomas N. Julian, Horsham, and Robert Glinecke, Glenside, all of Pa., assignors to McNeil-PPC, Inc., Milltown, N.J.

Continuation of Ser. No. 989,406, Dec. 19, 1992, abandoned, which is a division of Ser. No. 600,279, Oct. 22, 1990, Pat. No. 5,200,193, which is a continuation of Ser. No. 184,532, Apr. 21, 1988, abandoned, which is a continuation-in-part of Ser. No. 41,164, Apr. 22, 1987, Pat. No. 4,806,359. This application Jan. 17, 1995, Ser. No. 373,914

The portion of the term of this patent subsequent to Apr. 6, 2010, has been disclaimed.

Int. Cl.^{6} A61K *9/22;9/24;9/26*

U.S. Cl. 424—465 **7 Claims**



1. A process of preparing a pharmaceutical active sustained release shaped and compressed homogeneous tablet or tablet layer characterized by a long-lasting slow and relatively regular incremental release of the pharmaceutical active upon administration comprising the following steps:

A) forming a granulating agent by dissolving 5–30 parts, by weight of total non-active components of the tablet, of povidone in alcohol or an alcohol-water mixture;

B) blending together the following ingredients in dry powder form: an effective amount of pharmaceutical active which is sufficient to comprise about 66 to 96 percent by weight of the total tablet composition; and the following range of amounts of non-active ingredients given in a range of parts by weight of the total non-active components of the tablet;

Ingredient	Parts by Weight
ethylcellulose	3–12
wicking agent	10–35
erosion promoter	5–25

C) adding the granulating agent from Step A to the blended powders from Step B, and forming a wet granulation;

D) drying the wet granulation of Step C;

E) milling the dried granulation from Step D;

F) thoroughly blending the milled dried granulation from Step E with the following ingredients in dry powder form:

Ingredient	Parts by Weight
erosion Promoter	1–20
wicking agent	3–20
lubricant	0–10
glidant	0–10; and

G) compressing the final granulation from Step F into a tablet or tablet layer wherein the active to non-active component ratio is at least about 2:1.

5,462,748

BIOPOLYMER SYNTHESIS APPARATUS AND METHOD

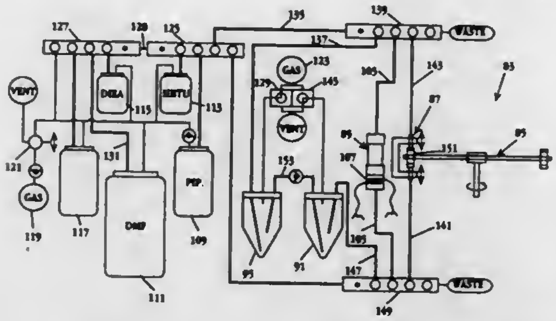
David H. Lloyd, Daly City; Robert J. DeFranco, San Carlos, and Charles S. Ladd, Union City, all of Calif., assignors to Applied Biosystems, Inc., Foster City, Calif.

Continuation of Ser. No. 883,541, May 15, 1992, abandoned, which is a continuation-in-part of Ser. No. 788,322, Nov. 5, 1991, Pat. No. 5,298,259. This application Jan. 14, 1994, Ser. No. 183,104

The portion of the term of this patent subsequent to Mar. 29, 2011, has been disclaimed.

Int. Cl.^{6} A61K *9/10;9/16;* **C07K** *1/06;1/10;* **B65D** *3/26;* **B01J** *19/18*

U.S. Cl. 424—484 **12 Claims**



1. An automated method for solid-phase synthesis of a biopolymer by a sequential addition of a biopolymer subunit to a growing biopolymer chain carried on a solid-phase support, comprising:

placing in a position for fluid transfer, a subunit delivery cartridge having means defining a chamber and port means through which liquid can be introduced into and removed from the chamber, said chamber containing a polymer composition composed of a dried polymer substrate which is swellable in an organic solvent and which has an internal polymer matrix through which molecules of such biopolymer subunit can diffuse when the matrix is a swollen state, and molecules of said biopolymer subunit entrapped within the matrix, such that suspension of the substrate in the organic solvent produces swelling of the substrate and diffusion of said molecules of said biopolymer subunit through the matrix and into the organic solvent, and means for retaining said substrate within the chamber, where the biopolymer subunit is selected from the group consisting of an N-protected amino acid, an activated amino acid, and an activated 5'-protected nucleotide;

adding an organic solvent into said cartridge chamber through said port means, thereby causing the polymer substrate in the cartridge chamber to swell and release said biopolymer subunit into the solvent to form a solution of the subunit; and

transferring the solution of biopolymer subunit into a reaction vessel containing such growing polymer chain on the solid-phase support.

5,462,749

BIOADHESIVE PHARMACEUTICAL CARRIER

William F. Rencher, Devon, Pa., assignor to McNeil-PPC, Inc., Milltown, N.J.

Division of Ser. No. 991,696, Dec. 16, 1992, Pat. No. 5,314,915, which is a division of Ser. No. 766,493, Sep. 25, 1991, Pat. No. 5,192,802. This application Apr. 26, 1994, Ser. No. 220,314

Int. Cl.^{6} A61K *9/02;9/06;47/00;* **A61L** *15/03*

U.S. Cl. 424—484 **7 Claims**

1. A bioadhesive pharmaceutical gel, consisting essentially of:

a therapeutically effective amount of an antidepressant agent;

about 0.25 to about 25 percent by weight sodium carboxymethyl cellulose;

about 0.25 to about 25 percent by weight xanthan gum or sodium alginate and;

diluent selected from the group consisting of glycerin, propylene glycol, dioxolanes, glycerol, glycofurol, dimethylacetamide, ethyl lactate, alcohols, glycols, sorbitols, USP oils, NF oils, lecithin, lanolin, ethyl oleate, isopropyl myristate, benzyl benzoate, petrolatum, cocoa butter and mixtures thereof.

5,462,750

BIOLOGICALLY ACTIVE COMPOSITIONS HAVING A NANOCRYSTALLINE CORE

Nir Kossovsky, Los Angeles, and Rolntan F. Bunshah, Playa del Rey, both of Calif., assignors to The Regents of the University of California, Oakland, Calif.

Continuation of Ser. No. 986, Jan. 6, 1993, abandoned, which is a continuation of Ser. No. 542,255, Jun. 22, 1990, Pat. No. 5,219,577. This application Apr. 8, 1994, Ser. No. 225,100

The portion of the term of this patent subsequent to Jun. 15, 2010, has been disclaimed.

Int. Cl.^{6} A61K *9/14*

U.S. Cl. 424—493 **9 Claims**

1. A composition of matter which is made by a process comprising the steps of:

providing a core particle having a diameter of less than about 1000 nanometers, said core particle comprising a metal, ceramic or polymer;

depositing a coating of a sugar or oligonucleotide onto the surface of said core particle by the step of suspending said core particle in a solution which consists essentially of water and said sugar for a sufficient time to provide a coated core particle; and

attaching a biologically active agent to said coated core particle wherein said biologically active agent includes at least one biologically active site and wherein said sugar or oligonucleotide which is deposited as said coating is selected to provide a threshold surface energy which is sufficient to bind said biologically active agent to said core particle without denaturing said biologically active site.

5,462,751

BIOLOGICAL AND PHARMACEUTICAL AGENTS HAVING A NANOMERIC BIODEGRADABLE CORE

Nir Kossovsky; H. James Hnatyszyn, and Andrew Gelman, all of Los Angeles, Calif., assignors to The Regeants of the University of California, Oakland, Calif.

Continuation-in-part of Ser. No. 199, Jan. 4, 1993, Pat. No. 5,334,394, which is a continuation-in-part of Ser. No. 690,601, Apr. 24, 1991, Pat. No. 5,178,882, which is a continuation-in-part of Ser. No. 542,255, Jun. 22, 1990, Pat. No. 5,219,577. This application Nov. 1, 1993, Ser. No. 146,536

The portion of the term of this patent subsequent to Jan. 12, 2010, has been disclaimed.

Int. Cl.^{6} A61K *9/14*

U.S. Cl. 424—494 **8 Claims**

1. A biochemically active composition of matter comprising:

a biodegradable core particle comprising a polymer or ceramic having a diameter of less than about 1000 nanometers;

a coating comprising a substance that provides a threshold surface energy to said core particle which is sufficient to bind biochemically active agents without denaturing said agents, said substance covering at least a part of the surface of said core particle and said substance being a carbohydrate; and

at least one biochemically active agent bound to said coated core particle wherein said biologically active agent bound to said core particle is not denatured to thereby provide said biochemically active composition.

5,462,752

INHIBITION OF PLATELET BINDING

Francis C. Chao, deceased, late of Newton, Mass.; Michael S. Chao, heir, New York, N.Y.; Mark S. Chao, heir, and Lorraine S. Chao, heir, both of Newton, Mass., assignors to PRP, Inc., Watertown, Mass.

Filed Jul. 28, 1994, Ser. No. 281,758

Int. Cl.^{6} A61K *35/14;37/00*

U.S. Cl. 424—532 **17 Claims**

1. A method for inhibiting the attachment of platelets to a site of an injury, comprising:

administering to a subject that has sustained an injury an effective amount of a platelet binding-site agent, wherein the platelet binding-site agent is a non-platelet.

5,462,753

TREATMENT OF SYMPTOMATIC BENIGN PROSTATIC HYPERPLASIA

Krishna M. Bhatta, 60 High St., Skowhegan, Me. 04976

Filed Apr. 30, 1993, Ser. No. 56,130

Int. Cl.^{6} A61K *33/36*

U.S. Cl. 424—670 **2 Claims**

1. A method of treating symptomatic benign prostatic hyperplasia in a human male which comprises administering orally to the male an average daily dosage of 50 to 1000 milligrams of potassium iodide for a period of from five to ten days.

5,462,754

ABHESIVE CHEWING GUM WITH IMPROVED SWEETNESS PROFILE

Steven P. Synosky, Greenbrook, N.J.; Michael J. Greenberg, Northbrook, and Gordon N. McGrew, Evanston, both of Ill., assignors to Wm. Wrigley Jr. Company, Chicago, Ill.

Filed Sep. 14, 1994, Ser. No. 306,027

Int. Cl.^{6} A23G *3/30*

U.S. Cl. 426—4 **33 Claims**

1. A substantially wax-free abhesive chewing gum having controlled sweetener release comprising a chewing gum base substantially free of waxes and elastomer plasticizers, the gum base including:

Ingredient	Wt. Percent of Gum Base
Synthetic Elastomer	about 20–75 weight percent,
Natural Elastomer	zero to about 30 weight percent,
Filler	about 4–45 weight percent,
Fats, Oils, Softeners	about 5–55 weight percent;

said wax-free chewing gum further comprising at least one flavoring agent, a water-soluble bulking agent, and at least one controlled release sweetener ingredient.

5,462,755

FLAVOR ENHANCEMENT IN CULTURED DAIRY PRODUCTS

David W. Mehnert, Antioch, Ill., assignor to Kraft Foods, Inc., Northfield, Ill.

Filed Mar. 25, 1994, Ser. No. 218,505

Int. Cl.^{6} A23C *19/00;13/16*

U.S. Cl. 426—36 **31 Claims**

1. A method for adding flavor to a cultured dairy product, said method comprising:

(a) adding a small amount of a fat fraction relative to the finished product during the manufacturing process of the dairy product at or prior to flavor development; and

(b) allowing the flavor to develop by means conventional to the product.

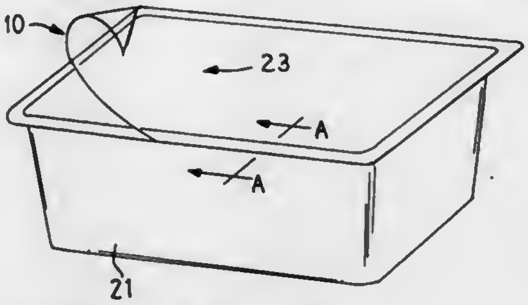
5,462,756

COOK-IN MEAT PACKAGE

Charles D. Raines, and Kenneth C. Hoffman, both of Columbus, Ga., assignors to Plicon Corporation, Columbus, Ga. Continuation of Ser. No. 978,452, Nov. 18, 1992, abandoned, which is a continuation of Ser. No. 830,553, Feb. 3, 1992, abandoned, which is a continuation of Ser. No. 504,592, Apr. 5, 1990, abandoned. This application Apr. 29, 1994, Ser. No. 236,661

Int. Cl.^{6} B65D *65/40;81/34*

U.S. Cl. 426—129 **8 Claims**



1. A cook-in meat package comprising:

a preformed tray;

a meat product contained in the tray; and

a flexible lid sealed to a rim of the tray, the meat product requiring a cooking step for consumption, each of the tray and the lid comprising a laminate that possesses high shrink and high strength during the cooking step of the meat product in the package, the laminate of each of the tray and the lid comprising an innermost surface layer that are sealed to each other around the periphery of the rim and that face the enclosed meat product, each of the innermost surface layers consists of an untreated ethylene acid copolymer having a low melt index of about 1.5 which has not been otherwise treated to enhance its adherence to the meat product during the cooking step, wherein each of the innermost surface layers adheres to the meat product and to the other innermost surface layer in the area around the meat product during the cooking step.

5,462,757

METHOD FOR MANUFACTURING TARTSHELLS

Caroline Booy, and Robert Booy, both of Box 40, Group 374, R.R. #3, Winnipeg, Manitoba, Canada

Filed May 26, 1994, Ser. No. 249,628

Int. Cl.^{6} A21C *3/00;11/00;9/08;* **A21D** *8/02*

U.S. Cl. 426—486 **4 Claims**

1. A method of forming a tart shell comprising providing a mold bottom having a flat base and a frusto-conical wall diverging upwardly and outwardly from the base so that the base and frusto-conical wall define a recess, placing into the recess of the mold bottom a tart case, placing onto the flat base of the tart case a piece of cold uncooked pastry dough in an initial shape to be formed into the tart shell, placing over the dough and across the recess of the mold bottom a sheet of non-stick plastics film, and pressing into the mold bottom a mold top having a flat base and a frusto-conical wall diverging upwardly and outwardly from the flat base thus defining a male portion for extending into the recess of the mold bottom, compressing the mold top into the mold bottom so as to deform the piece of dough from the initial shape and to

squeeze the dough from the flat base onto the frusto-conical wall, shaping the recess and the male portion such that the dough therebetween defines a layer inside the tart case of substantially constant thickness, removing the mold top from the mold bottom and, prior to effecting any heating of the tart shell, removing the plastics film from an inside surface of the tart shell.

5,462,758

METHOD OF MAKING MACARONI OR NOODLE PRODUCTS USING A LOW MOISTURE CONTENT ALIMENTARY PASTE

Romeo J. Ventres, New York; Edward A. Matuszak, Liverpool, and Carleton G. Merritt, Phoenix, all of N.Y., assignors to Borden, Inc., Columbus, Ohio

Continuation of Ser. No. 231,663, Aug. 12, 1988, abandoned, which is a continuation of Ser. No. 39,744, Apr. 20, 1987, abandoned. This application Dec. 10, 1990, Ser. No. 624,480

Int. Cl.^{6} A23P *1/12;* **A23L** *1/16*

U.S. Cl. 426—557 **5 Claims**

1. A method of making macaroni products or noodle products wherein said method comprises

blending in an extruder that is equipped with a die having a plurality of holes, a feedstock comprised of water and a dry component comprising glutinous flour to form an alimentary paste having a total moisture content at or less than about 28 weight percent, which said total moisture content includes the moisture present in said dry components as supplied to said feedstock, and

extruding said alimentary paste through one or more holes in the extruder die,

wherein at least 75 percent by weight of said dry component of said alimentary paste comprises glutinous flour, and

wherein the temperature of said alimentary paste in said extruder is (1) sufficiently low as to maintain the level of starch gelatinization below 10 weight percent of the total starch content in the extruded alimentary paste and (2) is sufficiently high to provide an internal pressure on the extruder die at a value below about 2500 psig without the incorporation of a modifying agent in said feedstock.

5,462,759

POWDER-FORM, FOAMING CREAMER

Johannes M. M. Westerbeek, Rosmalen; Jeroen T. M. Dijkgraaf, Veghel, both of, Netherlands, and Joseph B. S. Zijlmans, Oneonta, N.Y., assignors to Campina-Melkunie bv, Veghel, Netherlands

Filed Jul. 13, 1993, Ser. No. 90,949

Claims priority, application Netherlands, Jul. 14, 1992, 9201264

Int. Cl.^{6} A23J *3/00;* **A23L** *2/40*

U.S. Cl. 426—568 **20 Claims**

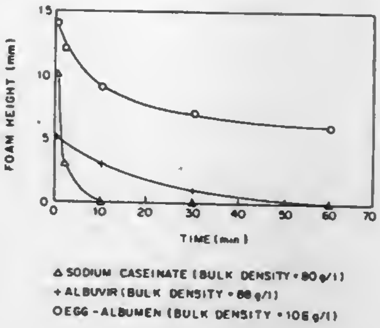
1. A powder-form foaming creamer which provides a foam at the surface of hot beverages and soups, comprising:

5–40% by weight of a fat component,

30–80% by weight of a carbohydrate component,

1–10% by weight of an egg-albumen component,

0–4% by weight of a stabilizing salt component, said percentages being based on the sum of the amounts of said components.



5,462,760

AERATED AND GRAINY CONFECTIONERY PRODUCT AND PROCESS FOR MANUFACTURING THE SAID CONFECTIONERY PRODUCT

Michel Serpelloni, Beuvry Les Bethune, and Guillaume Ribadeau-Dumas, Lambersart, both of, France, assignors to Roquette Freres, Lestrem, France

Filed Jun. 22, 1994, Ser. No. 264,354

Claims priority, application France, Jun. 24, 1993, 93 07697

Int. Cl.^{6} A23G *3/00*

U.S. Cl. 426—572 **18 Claims**

1. Aerated and grainy confectionery composition free from cellulose compounds, comprising

from 60 to 96% of a sweetening component,

from 4 to 40% of water and products selected from the group consisting of whipping agents, fats, proteins, garnishes, filling agents, emulsifiers, viscosifying agents, intense sweeteners, water activity modifiers, minerals, vitamins and essential fatty acids,

wherein 13.5 to 28% of the sweetening component is constituted by a polyol selected from the group consisting of mannitol, erythritol and mixtures thereof.

5,462,761

MICROCRYSTALLINE CELLULOSE AND GLUCOMANNAN AGGREGATES

Emanuel J. McGinley, Morrisville, and Domingo C. Tuason, Jr., Bensalem, both of Pa., assignors to FMC Corporation, Philadelphia, Pa.

Filed Apr. 4, 1994, Ser. No. 175,847

Int. Cl.^{6} A23L *1/0528;1/0534*

U.S. Cl. 426—573 **25 Claims**

1. A composition of matter comprising dry, water-dispersible, aggregate particles of microcrystalline cellulose (MCC) and a glucomannan which particles are coated by the glucomannan and wherein the MCC is from about 60 to 99 weight percent based on the solids weight of the total composition.

5,462,762

FABRICATION METHOD OF SUPERCONDUCTING QUANTUM INTERFERENCE DEVICE CONSTRUCTED FROM SHORT WEAK LINKS WITH ULTRAFINE METALLIC WIRES

Yoshio Onuma, Nagano, and Katsuyoshi Hamasaki, Nagaoka, both of, Japan, assignors to Shinko Electric Industries Co., Ltd., Nagano, Japan

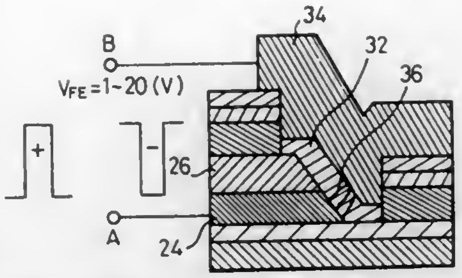
Division of Ser. No. 961,169, Oct. 16, 1992, abandoned. This application Jun. 13, 1994, Ser. No. 258,940

Claims priority, application Japan, Jan. 18, 1991, 3-299802; Jan. 18, 1991, 3-299803

Int. Cl.^{6} B05D *5/12;* **H01L** *39/24*

U.S. Cl. 427—63 **20 Claims**

1. A method of fabricating a superconducting quantum interference device (DC-SQUID) constructed from short weak links with metallic nanoconstriction paths, comprising:



- successively forming a base electrode layer and an insulation layer on a substrate, the base electrode layer comprising one of a niobium layer and a niobium compound layer;
- etching the base electrode layer and the insulation layer by a reactive ion etching process, using a mixture of oxygen and CF_4 gases, to form an oblique edge;
- successively forming an insulating thin film and a niobium counterelectrode layer on the oblique edge, the insulating thin film having pinholes therein; and
- forming the metallic nanoconstriction paths, electrically linking the base electrode layer and the counterelectrode layer together, by applying a voltage across the base electrode layer and the counterelectrode layer at a temperature at which the counterelectrode and base electrode layers are superconducting, thereby field evaporating the material of one of the base electrode layer and the counterelectrode layer and depositing the evaporated material into the pinholes in the insulating thin film.

5,462,763

METHOD FOR MANUFACTURING A LAMINATED COIL

Masatoshi Kondoh, Ohbu, Japan, assignor to Sumitomo Heavy Industries Ltd., Tokyo, Japan

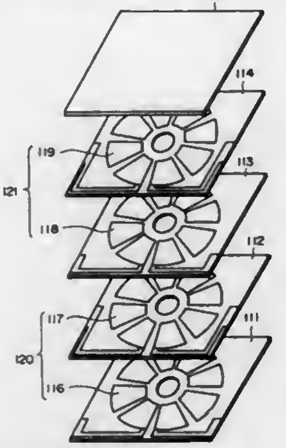
Continuation of Ser. No. 66,246, May 25, 1993, abandoned. This application Feb. 17, 1995, Ser. No. 390,427

Claims priority, application Japan, May 28, 1992, 4-136987

Int. Cl.^{6} B05D *5/12*

U.S. Cl. 427—96 **2 Claims**

1. A method for manufacturing a laminated coil for a motor, said



method comprising steps of:

- forming a first conductive pattern for a coil on a glass substrate;
- applying a first glass coating on said first conductive pattern;
- forming a second conductive pattern on said first glass coating; and
- applying a second glass coating on said second conductive pattern;
- heating the first conductive pattern, the first glass coating, the second conductive pattern, and the second glass coating, only to a temperature wherein the first conductive pattern becomes baked on the first glass substrate, and the second conductive pattern becomes baked on the first glass coating,

wherein said first and second conductive patterns are configured to create rotating magnetic fields, such that a rotating torque is produced in combination with a rotor.

5,462,764

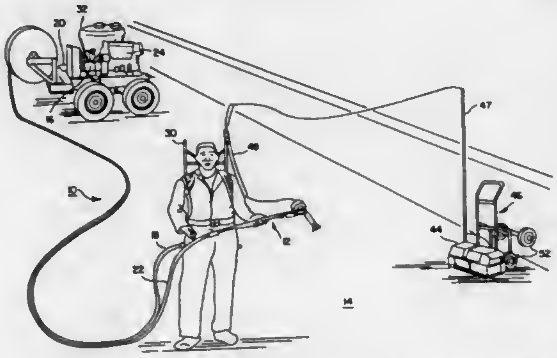
METHOD FOR CONSTRUCTING A SPRAY IN PLACE STRUCTURE

Greg Jones, 1340 Paseo Gracia, San Dimas, Calif. 91773, and Daryn Wyatt, 8581 Hamilton, Alta Loma, Calif. 91701

Division of Ser. No. 225,752, Apr. 11, 1994, which is a continuation of Ser. No. 931,144, Aug. 17, 1992, abandoned. This application Aug. 1, 1994, Ser. No. 283,587

Int. Cl.^{6} B05D *1/34*

U.S. Cl. 427—196 **9 Claims**



1. A method for creating a composition on a surface, comprising the steps of:

- a) cutting a plurality of strands that each have a longitudinal axis into a group of short strands and a group of long strands;
- b) spraying said strands onto the surface with a spray gun so that the longitudinal axis of said long strands is essentially perpendicular to a spray gun passage opening, wherein the flow of said long strands induces said strands to lie flat on the surface; and,
- c) spraying emulsion onto the surface such that said strands are embedded.into said emulsion.

5,462,765

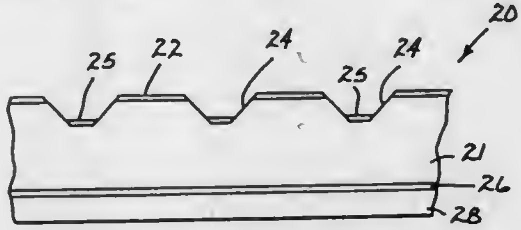
STRUCTURED FLEXIBLE CARRIER WEB BEARING A LAYER OF SILICONE ON PREDETERMINED SURFACES

Clyde D. Calhoun, Stillwater, and Carl R. Kessel, St. Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 740,323, Aug. 5, 1991, Pat. No. 5,273,805. This application Dec. 22, 1993, Ser. No. 138,767

Int. Cl.^{6} B05D *5/10*

U.S. Cl. 427—198 **16 Claims**



1. A method of making a flexible carrier web, comprising the steps of

- a) forming on a planar surface of a flexible backing a pattern consisting of at least one flat land area and at least one recess, said recess having a base and walls, said recess or said recesses having an average depth of at least about 5 micrometers, and
- b) applying to said land area a layer of a silicone, and

c) crosslinking said silicone such that said silicone does not flow into said recess or said recesses.

5,462,766

POLYURETHANE CARPET BACKING PROCESS BASED ON POLYMERIC MDI QUASI-PREPOLYMERS

Peter H. Markusch, McMurray, Pa., and James W. Rosthauser, Glen Dale, W. Va., assignors to Bayer Corporation, Pittsburgh, Pa.

Filed Feb. 15, 1994, Ser. No. 196,321

Int. Cl.⁶ B05D *3/10;3/02*

U.S. Cl. 427—244 15 Claims

1. In a process for the production of a polyurethane cushion backing on a substrate comprising the steps of:

a) mixing i) an isocyanate and ii) a polyol mixture to form a reaction mixture,

b) applying said reaction mixture to said substrate, and

c) curing said reaction mixture to form said polyurethane cushion backing,

the improvement wherein i) said isocyanate is based on a polymethylene poly(phenylisocyanate) and having a monomer content of less than 55%, a 2,2'- and 2,4'-methylene bis(phenylisocyanate) content of less than 3%, a functionality of less than 2.5, an isocyanate group content of 25 to 30%, and a urethane group content of from about 2 to 6%, and i) said isocyanate is prepared by mixing polymethylene poly(phenylisocyanate) with additional monomeric methylene bis(phenylisocyanate) to form 1) an isocyanate mixture, then reacting 1) said isocyanate mixture with 2) one or more organic compounds having a molecular weight of less than 500, an average functionality of from 1.0 to 3.0 and being selected from the group consisting of monoalcohols, diols, triols and mixtures thereof, to form i) said isocyanate.

5,462,767

CVD OF CONFORMAL COATINGS OVER A DEPRESSION USING ALKYLMETAL PRECURSORS

Shunpei Yamazaki, Tokyo, and Takashi Inujima, Kanagawa, both of, Japan, assignors to Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan

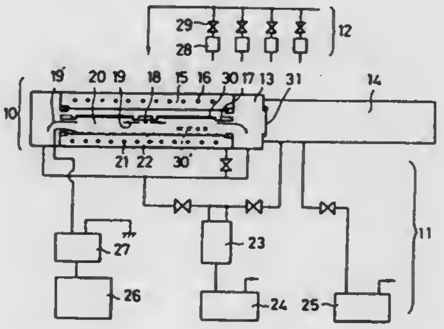
Continuation of Ser. No. 928,058, Aug. 11, 1992, abandoned, which is a division of Ser. No. 663,044, Feb. 26, 1991, abandoned, which is a continuation of Ser. No. 311,402, Feb. 15, 1989, abandoned, which is a continuation-in-part of Ser. No. 137,567, Dec. 24, 1987, abandoned, which is a continuation-in-part of Ser. No. 909,203, Sep. 19, 1986, Pat. No. 4,735,821.

This application Oct. 22, 1993, Ser. No. 139,864

Claims priority, application Japan, Sep. 21, 1985, 60-209597

Int. Cl.⁶ C23C *16/00;* H01L *21/306*

U.S. Cl. 427—248.1 17 Claims



1. A method of forming a depression or a cave structure in a top surface comprising:

forming at least one depression or a cave in said top surface where at least a portion of the depression or the cave has an inner surface;

providing a reactive precursor containing at least an alkyl metal compound; and

CVD forming from a gas of said reactive precursor at least one metal-containing layer over said top surface and said depression or cave such that the ratio ds/dt of the thickness (ds) of the layer on the inner surface of the depression or cave and the thickness (dt) of the layer on the top surface is substantially one.

5,462,768

SCREEN PRINTING PROCESS USING WATER-BASED CHEMICAL COMPOSITION

Ronald R. Adkins, Woodbury; Charles J. Fabbrini, Stillwater Township, Washington County, and Neal T. Strand, Woodbury, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 914,481, Jul. 21, 1992, abandoned, which is a continuation-in-part of Ser. No. 743,151, Aug. 9, 1991, abandoned. This application Mar. 18, 1993, Ser. No. 33,133

Int. Cl.⁶ B05D *1/36*

U.S. Cl. 427—265 5 Claims

1. A screen printing process comprising the steps:

(a) pre-conditioning a screen-printing stencil with water at a pre-determined time prior to applying a press-ready water-based chemical composition;

(b) saturating a volume above the printing surface with water vapor, such that the water vapor is intimately positioned over said printing surface, such that said volume remains saturated with the water vapor during subsequent steps (c) and (d);

(c) applying the press-ready water-based chemical composition to the screen-printing stencil, wherein the composition comprise:

(1) 35 to 85% by weight based on the total water-based chemical composition of an acrylic emulsion, urethane dispersion, an acrylic/urethane emulsion, or a styrene/acrylic emulsion; and

(2) 0 to 25% by weight based on the total water-based chemical composition of a durable pigment; and

(d) screen printing a substrate.

5,462,769

METHOD FOR COATING METAL COOKWARE

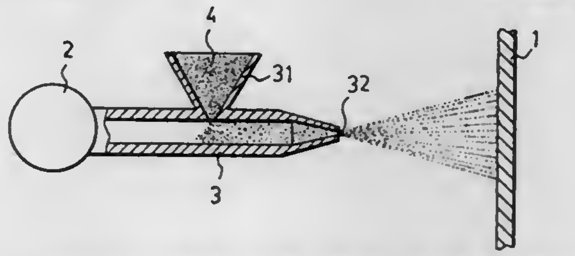
Tung-Hung Tsai, No. 20, Lane 104, Ta-Liao Rd., Ta-Liao Tsun, Ta-Liao Hsiang, Kaohsiung Hsien, Taiwan, Prov. of China

Continuation-in-part of Ser. No. 55,680, Apr. 29, 1993, Pat. No. 5,411,771. This application Dec. 29, 1994, Ser. No. 365,917

The portion of the term of this patent subsequent to May 2, 2012, has been disclaimed.

Int. Cl.⁶ B05D *3/04*

U.S. Cl. 427—307 2 Claims



1. A method of coating a metal cookware having a cooking surface, comprising the steps of:

(A) roughening and cleaning said cooking surface of said metal cookware;

(B) applying a metallic scratch-resistant layer onto the roughened and cleaned cooking surface; and

(C) applying an anti-stick layer onto the scratch-resistant layer, whereby the anti-stick layer has a roughness of about 2.5–5.5 μm, a thickness of about 23–36 μm and a pencil hardness of about 8–9 H, said anti-stick layer consisting essentially of polytetrafluoroethylene (PTFE) and perfluoroalkoxy polymers (PFA), the ratio of PTFE to PFA ranging from 55:45 to 60:40.

5,462,770

PROCESS FOR FORMING A COATING ON A SUBSTRATE

Seigo Miyazoe, Takatsuki; Tsuneyoshi Hisai, Hirakata; Akira Fushimi, Ikoma; Kazuhiko Takeoka, Kawanishi; Yoshitaka Okude, Hirakata, and Takeo Kurauchi, Neyagawa, all of, Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Division of Ser. No. 123,853, Sep. 9, 1993. This application Mar. 7, 1995, Ser. No. 399,462

Claims priority, application Japan, Sep. 9, 1992, 4-240389

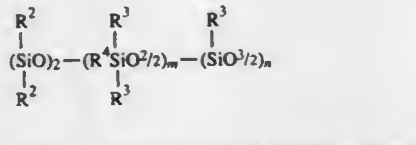
Int. Cl.^{6} B05D *1/36;7/00*

U.S. Cl. 427—407.1 **1 Claim**

1. A process for forming a coating on a substrate comprising: forming a primer coating or optionally further forming an intercoating on a substrate; coating a waterborne or solvent-borne color base paint on the primed or intercoated substrate; coating a clear paint thereon without curing the base paint layer; and baking both the base and clear coating layers to cure; an improvement being present in that the clear paint comprising a coating composition comprising the following components:

(a) from about 5 to 50% by weight of a hydroxyl and carboxyl group containing silicone polymer prepared by half esterifying:

(i) a hydroxyl group containing silicone polymer having an average of 3 to 12 hydroxyl groups per molecule of the formula:



$$\underset{R^2}{\overset{R^2}{(SiO)}}{}_2-(R^4\underset{R^3}{\overset{R^3}{Si}}O^{2}/2)_m-(\overset{R^3}{Si}O^{3}/2)_n$$

wherein, R^1 represents a methyl, phenyl or phenylethyl group, R^2 and R^3 each independently represents a methyl, phenyl, phenylethyl, hydroxypropyl or 3-(hydroxyethoxy)propyl group, R^3 represents methyl group, R^4 represents a methyl, 3-hydroxypropyl or 3-(hydroxyethoxy)propyl group, R^5 represents a methyl, phenyl, phenylethyl or isobutyl group, provided, at least one of R^2, R^3, and R^4 represent 3-hydroxypropyl or 3-(hydroxyethoxy)propyl group, l represents an integer or 1 to 20, m represents an integer of 2 to 4, an n represents an integer of 0 to 2; with

(ii) an anhydride group containing compound; in such an amount that a molar ratio of the hydroxyl group to the anhydride group is 1/1.0 to 1/0.2;

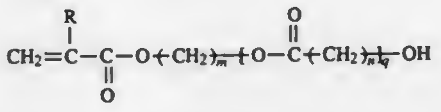
(b) from about 20 to 60% by weight of a carboxyl and carboxylate group containing polymer prepared by reacting;

(i) an anhydride group containing polymer prepared by copolymerizing: (1) from about 15 to 40% by weight of an ethylenically unsaturated monomer having an anhydride group; and (2) from about 60 to 85% by weight of another copolymerizable ethylenically unsaturated monomer; with

(ii) a hydroxyl group containing compound having 1 to 12 carbon atoms; in such an amount that a molar ratio of anhydride group to hydroxyl group is from about 1/1.5 to 1/1; and

(c) from about 30 to 60% by weight of a hydroxyl and epoxy group containing polymer prepared by copolymerizing:

(i) from about 5 to 40% by weight of a hydroxyalkyl (meth-)acrylate of the formula:



$$CH_2=\overset{R}{\overset{|}{C}}-\underset{\underset{O}{\|}}{C}-O\!\left(CH_2\right)_m\!\left[O-\overset{\overset{O}{\|}}{C}\!\left(CH_2\right)_n\right]_q\!-OH$$

wherein, R represents a hydrogen atom or methyl group, m represents an integer of 2 to 8, n represents an integer of 3 to 7, and q represents an integer of 0 to 4;

(ii) from about 10 to 60% by weight of an ethylenically unsaturated monomer having an epoxy group; and optionally

(iii) from about 0 to 85% by weight of another copolymerizable ethylenically unsaturated monomer.

5,462,771

METHOD OF MANUFACTURING ELECTROMAGNETIC WAVE SHIELDING PLASTIC MOLDING

Akira Motoki, 28-1, Takatsukadai 2-chome, Kawai-cho, Kitakatsuki-gun, Nara, and Yoichi Murayama, 304 Domusumejiro, Shimoochiai 3-chome, Shinjuku-ku, Tokyo, both of, Japan

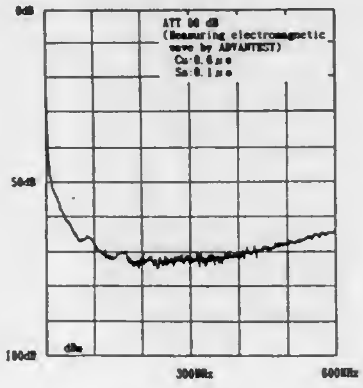
Filed Nov. 9, 1993, Ser. No. 149,533

Claims priority, application Japan, Nov. 9, 1992, 4-298940; Nov. 26, 1992, 4-317380; Feb. 18, 1993, 5-29215; Feb. 18, 1993, 5-29216; Feb. 18, 1993, 5-29217; Sep. 7, 1993, 5-222638

Int. Cl.^{6} C23C *4/00*

U.S. Cl. 427—537 **19 Claims**

1. A method of manufacturing an electromagnetic wave shielding plastic molding, which comprises the step of providing a conductive layer comprising at least a metal selected from the group consisting of Al, Cu, Ni, Cr and Sn or an alloy thereof on the surface of a plastic molding by high-frequency excited plasma in a vacuum chamber at a pressure or not more than 1×10^{-3} Torr by the application of voltage from a high-frequency source, said conductive layer being formed on the plastic molding without prior washing and without providing a primer layer.



5,462,772

METHODS FOR FORMING ARTIFICIAL DIAMOND

Jerome H. Lemelson, Call Box 14-286, Incline Village, Nev. 89450

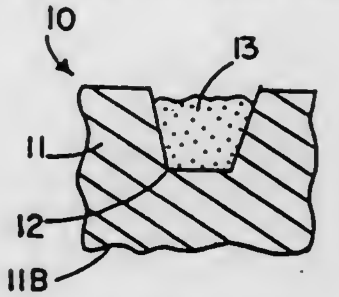
Continuation of Ser. No. 698,090, May 10, 1991, abandoned, which is a continuation-in-part of Ser. No. 372,858, Jun. 29, 1989, Pat. No. 5,021,628, which is a continuation-in-part of Ser. No. 625,197, Jun. 28, 1984, Pat. No. 4,874,596, which is a continuation of Ser. No. 302,644, Sep. 15, 1981, abandoned, which is a continuation-in-part of Ser. No. 110,477, Jan. 8, 1980, abandoned, which is a continuation of Ser. No. 815,692, Jul. 14, 1977, abandoned, which is a continuation of Ser. No. 547,733, Feb. 6, 1975, abandoned, which is a continuation-in-part of Ser. No. 93,779, Nov. 30, 1970, Pat. No. 4,207,154, said Ser. No. 302,644is a continuation-in-part of Ser. No. 74,388, Sep. 10, 1979, Pat. No. 4,385,880, which is a continuation of Ser. No. 958,514, Nov. 7, 1978, abandoned, and a continuation of Ser. No. 165,445, Jul. 26, 1971, abandoned, which is a continuation of Ser. No. 710,517, Mar. 5, 1968, abandoned, which is a continuation of Ser. No. 501,395, Oct. 22, 1965, Pat. No. 3,371,404. This application May 13, 1993, Ser. No. 30,506

The portion of the term of this patent subsequent to Oct. 12, 2006, has been disclaimed.

Int. Cl.^{6} B05D *3/06*

U.S. Cl. 427—554 **29 Claims**

1. A method for forming artificial diamonds comprising:



(a) placing in contact with each other a quantity of non-diamond material in solid phase, which material is at least partially comprised of the element carbon, and a solid support;
(b) generating a laser beam; and
(c) aiming said laser beam at said carbonaceous material to heat said material sufficiently to convert said material to synthetic diamond.

5,462,773

SYNCHRONIZED PROCESS FOR CATALYSIS OF ELECTROLESS METAL PLATING ON PLASTIC

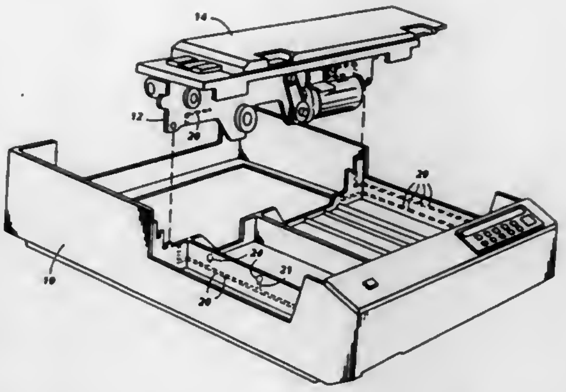
Joseph A. Swift, Ontario, and Thomas E. Orlowski, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 28, 1992, Ser. No. 996,990

Int. Cl.^{6} B05D *1/18*

U.S. Cl. 427—555 **22 Claims**

1. A method of forming at least one electrically conductive path having a pattern in a plastic substrate comprising providing a thermoplastic substrate having a melting point below 325° C., depositing on said substrate in the pattern of said conductive path a catalyst for the electroless deposition of conductive metals by synchronously depositing on said substrate in the pattern of said conductive path an atomized stream of a precursor of the catalyst and locally heating said deposited precursor in the pattern corresponding to said conductive path, said catalyst precursor having a decomposition temperature below the melting point of said thermoplastic and within the temperature range where said thermoplastic softens, heating the portion of said thermoplastic substrate corresponding to said conductive path to a temperature sufficient to decompose said catalyst precursor to said catalyst and soften said thermoplastic; said substrate, catalyst precursor and temperature being selected such that on heating to the temperature the precursor decomposes to the catalyst, the thermoplastic softens and at least partially melts without substantial decomposition to enable the catalyst to penetrate the surface of the thermoplastic and become anchored thereto to provide nucleation sites for the subsequent electroless deposition of conductive metal and depositing conductive metal by electroless deposition on said heated portion to form said conductive path.



5,462,774

LASER ENGRAVING TO FORM PRINTING SURFACES

Michel Huvey, Bougival; Francois Grosjean, Versailles, and Lucien Montabord, Cormeilles en Parisis, all of, France, assignors to Institut Francais du Petrole, Rueil Malmaison, France

Filed Sep. 2, 1993, Ser. No. 115,076

Int. Cl.^{6} B05D *3/00*

U.S. Cl. 427—555 **11 Claims**

1. In a process comprising engraving a coated surface with a laser beam to provide a gravure printing surface, said process comprising impacting said laser beam on zones of said coated surface to engrave them,

the improvement wherein said coated surface is formed from a thermally hardened composition consisting essentially of at least one resin, optionally a hardener, and, optionally, a particulate filler, said resin being (a) a condensation polymer consisting essentially of the reaction product of formaldehyde with furfuryl alcohol, furfural, melamine, a phenol or urea, or (b) a furan resin consisting essentially of a reaction product of furfuryl alcohol or furfural with urea, a phenol or itself,

said hardened resin, at the zones of laser beam impact, undergoing coking and decomposing to mostly solids or gaseous products at the decomposition temperature.

5,462,775

METHOD OF PRODUCING HARD MULTILAYER FILM FORMED MATERIAL

Minoru Yamada, Kurobe, and Shingo Kawamura, Toyama, both of, Japan, assignors to Yoshida Kogyo K.K., Tokyo, Japan

Division of Ser. No. 90,924, Jul. 14, 1993. This application Mar. 7, 1995, Ser. No. 399,641

Claims priority, application Japan, Jul. 7, 1992, 4-205042

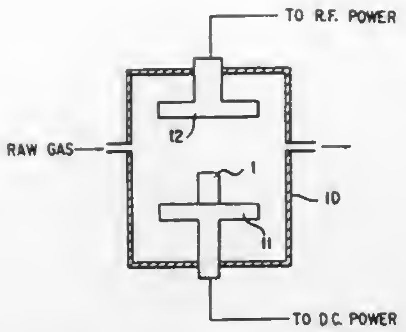
Int. Cl.^{6} B05D *3/06*

U.S. Cl. 427—573 **7 Claims**

1. A method for the production of a hard multilayer film coated material, which comprises the steps of:

setting a substrate in place inside a vacuum chamber,

depositing a hard wear-resistant layer of a titanium-containing compound on said substrate by a plasma-enhanced chemical vapor deposition process at a temperature in the range of about 400° C. to about 550° C. and



introducing into said chamber a raw gas containing a tetraalkyl silane selected from the group consisting of tetramethyl silane and tetraethyl silane to deposit a silicon-containing hard carbon layer on said wear-resistant layer by the plasma-enhanced chemical vapor deposition process at a substrate temperature of not more than 550° C. and a pressure in the range of 0.05 to 0.5 Torr.

5,462,776

CONVERSION OF FULLERENES TO DIAMONDS

Dieter M. Gruen, 1324 59th St., Downers Grove, Ill. 60515

Continuation of Ser. No. 35,419, Mar. 23, 1993, Pat. No. 5,370,855, which is a continuation-in-part of Ser. No. 995,456, Dec. 22, 1992, Pat. No. 5,328,676, and a continuation-in-part of Ser. No. 797,590, Nov. 25, 1991, Pat. No. 5,209,916. This application Jul. 6, 1994, Ser. No. 271,044

The portion of the term of this patent subsequent to May 11, 2010, has been disclaimed.

Int. Cl.^{6} B05D *3/06;* **C01B** *31/06*

U.S. Cl. 427—577 **7 Claims**

1. A method of forming synthetic diamond or diamond-like films on a substrate having a substrate surface covered with a coating selected from the group consisting of fullerene and diamond, comprising the steps of:

(a) providing a vapor selected from the group consisting of fullerene molecules and an inert gas and fullerene molecules, said fullerene molecules consisting of carbon-carbon bonds;

(b) providing means for imparting energy to said fullerene molecules consisting of carbon-carbon bonds;

(c) exposing said vapor of fullerene molecules, consisting of carbon-carbon bonds to said means for imparting energy;

(d) transferring said energy from said means for imparting energy to said vapor of fullerene molecules consisting of carbon-carbon bonds to form energized fullerene molecules;

(e) said energized fullerene molecules breaking down to form fragments of said fullerene molecules, including forming C_2 molecules;

(f) depositing said energized fullerene molecules, including said fragmented C_2 molecules, on said substrate with further fragmentation of said energized fullerene molecules occurring and causing formation of a thickness of diamond or diamond-like film on said substrate surface; and

(g) continuing said steps (a)–(f) to obtain a thickness for said diamond or diamond-like film on said substrate surface.

5,462,777

WRAPPING MULTILAYER FILM

Haruo Hayashida; Akihiro Ichige, both of Chiba; Tadatoshi Ogawa; Takeshi Yamada, both of Osaka; Teruo Tada, Kagawa; Masaaki Zenigame, Kagawa; Toyoki Wano, Kagawa, and Kazuo Kondo, Kagawa, all of, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, and Kura Industrial Company, Limited, Kagawa, both of, Japan

Filed Jun. 28, 1994, Ser. No. 266,575

Claims priority, application Japan, Jun. 28, 1993, 5-156848

Int. Cl.^{6} B32B *27/08;27/32;* **B65D** *71/00*

U.S. Cl. 428—2 **4 Claims**

1. A wrapping multilayer film comprising at least 5 layers of

(A) both the outermost layers each comprising an ethylene-α-olefin copolymer of an ethylene and an α-olefin having from 3 to 10 carbon atoms, produced using a titanium catalyst or a vanadium catalyst, and having an ethylene content of at least 50 mol % and a density of from 0.870 g/cm^3 to 0.915 g/cm^3,

(B) layers each comprising a propylene-ethylene copolymer having an ethylene content of from 3 to 12 mol % and being disposed between the outermost layers (A), and

(C) a layer comprising recycled resins and being disposed between the layers (B), wherein said recycled resins comprise trimming losses consisting essentially of said ethylene-α-olefin copolymer for forming the layer (A) and said propylene-ethylene copolymer for forming the layer (B).

5,462,778

ARTIFICIAL TURF, PILE YARN FOR ARTIFICIAL TURF AND PROCESS AND SPINNERET FOR PRODUCING PILE YARN

Yoshio Ishikawa, Kishiwada, Japan, assignor to Otsuka Kagaku Kabushiki Kaisha, Japan

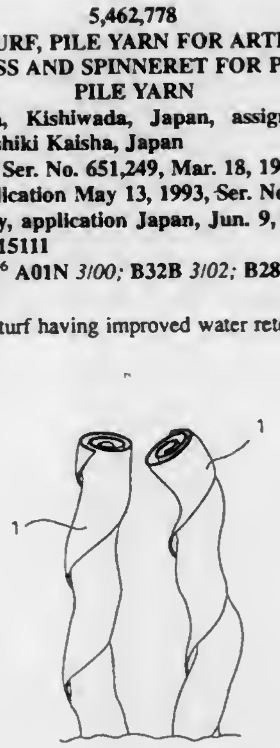
Continuation of Ser. No. 651,249, Mar. 18, 1991, abandoned. This application May 13, 1993, Ser. No. 67,492

Claims priority, application Japan, Jun. 9, 1989, 1-147084; Dec. 4, 1989, 1-315111

Int. Cl.^{6} A01N *3/00;* **B32B** *3/02;* **B28B** *5/00*

U.S. Cl. 428—17 **3 Claims**

1. An artificial turf having improved water retentivity including a cut pile which is formed over the surface of a backing structure by implanting in the backing structure a multiplicity of tufts, each of which comprises at least one pile yarn having a longitudinal axis, each pile yarn comprising one filament or a plurality of bundled filaments, the one or plurality of filaments having one of a C-shaped, reverse C-shaped, S-shaped or reverse S-shaped cross section and being spirally wound, the wound filaments being fixed into a slender form having a spiral cross section when viewed in a plane generally perpendicular to the axis, the pile yarn having an interior void extending along the axis of the pile yarn.



5,462,779

THIN FILM MULTILAYER STRUCTURE AS PERMEATION BARRIER ON PLASTIC FILM

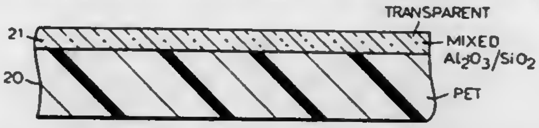
Carlo Misiano; Enrico Simonetti, both of Rome, and Francesco Staffetti, Torninparte, all of, Italy, assignors to Consorzio Ce.Te.V. Centro Tecnologie del Vuoto, Carsoli, Italy

Continuation-In-part of Ser. No. 956,736, Oct. 2, 1992, abandoned. This application Mar. 2, 1993, Ser. No. 25,514

Int. Cl.^{6} B32B *18/00;27/06;27/36;7/02*

U.S. Cl. 428—34.7 **8 Claims**

1. A packaging and wrapping film, comprising a plastic foil, and a transparent barrier coating on said foil reducing permeability thereof to gas and vapor, said coating consisting essentially of SiO_2 and Al_2O_3 uniformly deposited over a surface of said foil and adherent thereto, said coating being formed in a single layer on said foil containing both SiO_2 and Al_2O_3, the concentrations of both SiO_2 and Al_2O_3 varying continuously across the entire thickness of said layer.



5,462,780

PIPE COATING COMPOSITIONS

Mildred C. Richards, Wakefield, Mass., assignor to The Kendall Company, Mansfield, Mass.

Continuation of Ser. No. 992,344, Dec. 17, 1992, abandoned. This application Feb. 22, 1994, Ser. No. 199,926

Int. Cl.^{6} B29D *22/00*

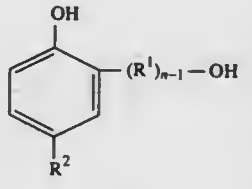
U.S. Cl. 428—35.8 **5 Claims**

1. An article of manufacture protected against degradative environmental forces comprising:

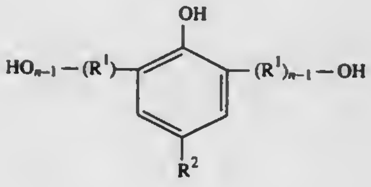
a metal pipe for inground implantation;

a primer coating carried on the outer surface of the pipe; and

an adhesive tape comprising a backing material carrying an adhesive layer on its inner surface covering the primer coating, wherein the primer coating is an adhesive composition comprising a mixture of solid components including at least one synthetic elastomer and an effective amount for an increase in protection against environmental forces of a cathodic disbondment inhibitor consisting essentially of the resin formed by self-condensation of a sterically hindered phenol of the formulae:



or;



wherein

R^1 is a alkylene having 1–4 carbon atoms;

R^2 is alkyl containing at least 8 carbon atoms or arylalkyl; and

n is i or 2,

characterized in that the elastomer consists essentially of a triblock copolymer backbone having polystyrene end blocks and polyethylene or polybutylene mid blocks, the tri-block copolymer being functionalized with an effective amount of anhydrides bonded to the polymer backbone.

5,462,781

SURFACE MODIFIED POROUS EXPANDED POLYTETRAFLUOROETHYLENE AND PROCESS FOR MAKING

Stanislaw L. Zukowski, Flagstaff, Ariz., assignor to W. L. Gore & Associates, Inc., Newark, Del.

Continuation-In-part of Ser. No. 161,184, Dec. 1, 1993, which is a continuation of Ser. No. 718,324, Jun. 14, 1991, abandoned. This application May 2, 1994, Ser. No. 236,305

Int. Cl.^{6} A61F *2/01;2/04;2/06;2/52;* **A61L** *27/00;* **B32B** *33/00*

U.S. Cl. 428—36.1 **17 Claims**

1. An implantable material comprising porous expanded polytetrafluoroethylene having a microstructure comprised of nodes interconnected by fibrils, said porous expanded polytetrafluoroethylene comprising a three dimensional material having at least one surface wherein at least a substantial portion of the at least one surface is comprised of freestanding node portions with open valleys disposed between the freestanding node portions.

17. A method of modifying a surface of an implantable porous expanded polytetrafluoroethylene material, said implantable porous expanded polytetrafluoroethylene material having a microstructure of nodes interconnected by fibrils, said method comprising exposing the surface to a reactive gas plasma discharge until the fibrils are removed from at least a substantial portion of the surface and the surface is comprised of freestanding node portions with open valleys disposed between the freestanding node portions.

5,462,782

ADHESIVE PLATE ASSEMBLY FOR SHEET OBJECT

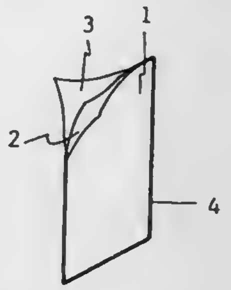
Ching-Fang Su, No. 184 Fengren Rd., Fengsan, Kaushiong, Taiwan, Prov. of China

Filed Jan. 22, 1993, Ser. No. 7,478

Int. Cl.^{6} A47F *7/14;* **A47G** *1/17;* **B32B** *27/00*

U.S. Cl. 428—40 **4 Claims**

1. A flat adhesive plate assembly for a mounting sheet object which is directly displayed by said adhesive plate assembly and removably adhered only to a glazy surface, said plate assembly consisting of:



a hard polyethylene layer comprising one surface and another surface, having a releasable pressure adhesive and coating on one surface thereof;

a release paper protection layer removably adhered to said one surface of said polyethylene layer for protecting said pressure adhesive coating from contamination so that after said protection layer is removed, said sheet object is adhered to said polyethylene layer responsive to pressing said adhesive coating directly against said sheet object;

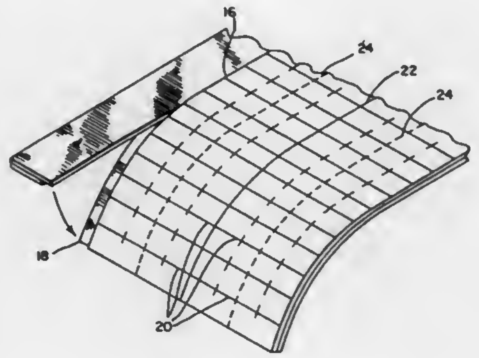
a soft polyvinyl chloride layer attached to said polyethylene layer and repeated removable from and reattachable directly to said glazy surface; and an adhesive disposed between said polyvinyl chloride layer and the other surface of said polyethylene layer for adhering together said polyethylene layer and said polyvinyl chloride layer.

5,462,783
LABEL DISPENSING SHEET

Dennis Esselmann, 1773 Audubon Ave., Grafton, Wis. 53024
Filed Aug. 23, 1994, Ser. No. 293,901
Int. Cl.^{6} B42F *21/00;* **G09F** *3/00*

U.S. Cl. 428—40 **3 Claims**

1. A tabbing or indexing label dispensing sheet of multiple layer construction for indexing a book, comprising a 0.003 to 0.0045 inch thick paper liner, and a facing sheet of 0.008 to 0.012 inch thick paper stock releasably secured to said liner by a pressure sensitive type adhesive, said liner and facing sheet having overlying, extended marginal portions for binding the label dispensing sheet within said book, said extended marginal portions being die cut in the case of the liner and perforated line in the case of the facing sheet, both being parallel and spaced apart from a longitudinal edge of said sheet, to provide a lock and release construction holding said label dispensing sheet securely in said book while permitting its ready removal therefrom during indexing of the book, said die cut in said liner and said perforation line in said facing sheet being offset with respect to one another, said facing sheet formed with a series of indicia bearing labels for application to selected pages of the book along the edges thereof to mark the particular divisions of the book according to content, said labels having right and left-hand sections separated by a scored center fold line enabling said sections to be folded back upon one another and upon the front and rear faces of the book pages in the assembled position, said half sections of the labels being inscribed with edge markings for aligning labels with the page edges during assembly thereto to maintain a uniform projection of the labels from the book pages in their assembled position.

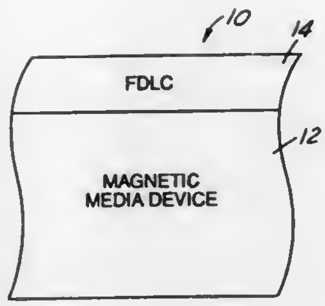


5,462,784
FLUORINATED DIAMOND-LIKE CARBON PROTECTIVE COATING FOR MAGNETIC RECORDING MEDIA DEVICES

Alfred Grill, White Plains, and Vishnubhai V. Patel, Yorktown Heights, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Nov. 2, 1994, Ser. No. 333,405
Int. Cl.^{6} H01F *10/02*

U.S. Cl. 428—65.5 **17 Claims**

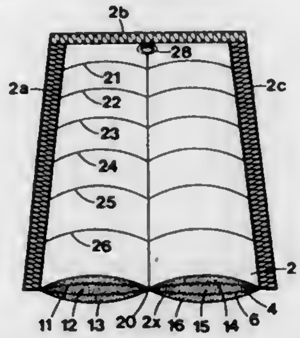
1. A magnetic recording media device having a wear-resistant and reduced-stiction fluorinated diamond-like carbon film as the uppermost protective layer.



5,462,785
LIQUID HYDROCARBON SORBING AND SOLIDIFYING PILLOW

Herbert W. Holland, 2314 Chimney Rock, Houston, Tex. 77056
Filed Apr. 5, 1994, Ser. No. 222,844
Int. Cl.^{6} B32B *3/00*

U.S. Cl. 428—76 **14 Claims**

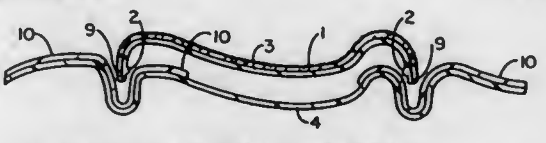


1. A liquid hydrocarbon absorbent device comprising:
a pillow having a plurality of chambers formed in stratification therein by internal layers of textile material;
a polymer material disposed in the chambers having a property of acting to absorb and solidify liquid hydrocarbon substances coming into contact with the pillow and migrating to its interior; and
a plurality of quilting seams in the pillow defining a multiplicity of hydrocarbon absorption consolidation points therein and subdividing each chamber into distinct hydrocarbon absorption units within the pillow.

5,462,786
DECORATIVE PANELS FOR AUTOMOBILE INTERIORS

Jack Van Ert, Sheboygan, Wis., assignor to ASAA Technologies, Inc., Sheboygan, Wis.
Continuation of Ser. No. 818,685, Jan. 7, 1992, abandoned, which is a division of Ser. No. 673,539, Mar. 22, 1991, abandoned. This application Mar. 10, 1994, Ser. No. 212,399
Int. Cl.^{6} B32B *5/14*

U.S. Cl. 428—171 **11 Claims**



1. A contoured decorated panel, comprising:
a mounting panel comprising a thermoplastic material and having a groove therein; and
a decorative insert comprising a decorative surface, a thermoplastic backing laminated onto the decorative surface, and an edge which is disposed in the groove in the mounting panel, the edge having a lateral protrusion which is embedded into the a wall of the groove of the mounting panel in a manner effective to hinder removal of the edge from the groove.

5,462,787

RECORDING MEDIUM FOR BUSINESS MACHINES, PRODUCTION THEREOF, AND INK-JET RECORDING METHOD EMPLOYING THE SAME

Tohru Yamamoto, and Shigeo Yoshida, both of Shiga, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 5, 1993, Ser. No. 102,304

Claims priority, application Japan, Aug. 13, 1992, 4-216214; Sep. 11, 1992, 4-243655; Mar. 31, 1993, 5-074301

Int. Cl.^{6} B32B *3/00*

U.S. Cl. 428—195 **10 Claims**

1. A recording medium for business machines having an ink-receiving layer provided on a substrate, the ink-receiving layer comprising a highly water-absorbent material in which a polyacrylic acid is grafted onto an alkoxide selected from inorganic alkoxides and metal alkoxides.

5,462,788

THERMOPLASTIC RESIN FILM HAVING EXCELLENT PRINTABILITY

Takashi Ohashi; Motoshi Hembo; Takatoshi Nishizawa, and Isao Sunaga, all of Ibaraki, Japan, assignors to Oji Yuka Goseishi Co., Ltd., Tokyo, Japan

Filed Oct. 27, 1994, Ser. No. 330,012

Claims priority, application Japan, Feb. 3, 1994, 6-011642

Int. Cl.^{6} B32B *3/00*

U.S. Cl. 428—201 **13 Claims**

1. A thermoplastic resin film having excellent printability comprising (a) a support layer comprising a thermoplastic resin film and (b) a pigment coating layer provided on the front surface of said support layer or both the front surface and back surface of said support layer, wherein said thermoplastic resin film contains 1 to 30% by weight of petroleum resin.

5,462,789

SUBSTRATE

Hans Hecht, Korntal, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

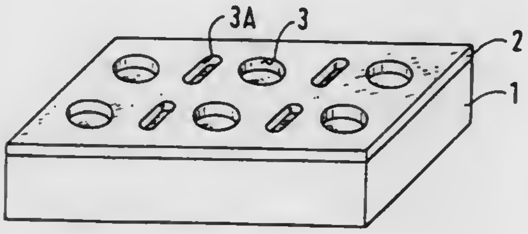
Continuation of Ser. No. 728,584, Jul. 11, 1991, Pat. No. 5,256,464. This application May 20, 1993, Ser. No. 64,532

Claims priority, application Germany, Aug. 18, 1990, 40 26 225.1

The portion of the term of this patent subsequent to Oct. 26, 2010, has been disclaimed.

Int. Cl.^{6} B32B *9/00*

U.S. Cl. 428—209 **16 Claims**



1. An electronic device comprising:

a base layer made of an insulating material; and

a resistance layer having a first surface adjacent to at least a portion of the base layer, a second surface opposite to the first surface, and a plurality of side surfaces, the second surface having a plurality of recesses disposed therein, each of the plurality of recesses being spaced from each of the plurality of side surfaces.

5,462,790

COMBINED AND MULTI-COMPONENT FALSE-TWIST TEXTURED FILAMENT YARN, PRODUCTION METHOD THEREOF, AND KNITTED/WOVEN FABRIC USING THE YARN

Sadao Matsuki; Moriyuki Motogi, both of Ishikawa; Keitaro Nabeshima, Otsu, and Minoru Kadowaki, Ibaraki, all of, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

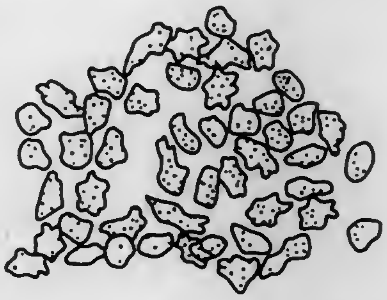
PCT No. PCT/JP93/01881, § 371 Date Sep. 22, 1994, § 102(e) Date Sep. 22, 1994, PCT Pub. No. WO94/18365, PCT Pub. Date Aug. 18, 1994

PCT Filed Dec. 24, 1993, Ser. No. 307,574

Claims priority, application Japan, Feb. 4, 1993, 5-017404; May 19, 1993, 5-117257; May 19, 1993, 5-117258

Int. Cl.^{6} D03D *3/00*

U.S. Cl. 428—229 **18 Claims**



1. A combined and multi-component false-twist textured filament yarn consisting of at least two kinds of false-twist textured polyester multi-filament yarns having different sectional shapes, characterized in that at least one kind of said filament yarn has a sectional shape not having a recess and the other of said filament yarns have a sectional shape having recesses, and said filament yarns having the respective sectional shapes are dispersedly mix-textured, and have the following characteristics:

$$U\ \% \geqq .8 \tag{1}$$

$$\Delta Sw\ (\%) \leqq 15 \tag{2}$$

$$CR\ (\%) \leqq 42 \tag{3}$$

$$TR\ (\%) \leqq 20 \tag{4}$$

where:

U % is a uster evenness

ΔSw is a boiling water shrinkage ratio,

CR is a crimp rigidity, and

TR is a crimp appearance stretch ratio.

5,462,791

FIBER-REINFORCED PLASTIC MATERIAL COMPRISING STACKED WOVEN FABRICS OF DIFFERENTIAL WEAVE IN A PLASTIC MATRIX

Toshihiro Kashima, Otsu; Masayuki Hoshino, Yokohama; Masachika Nakano, Yokohama, and Tokushiro Hirano, Yokohama, all of, Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaki, and Toshiba Corporation, Tokyo, both of, Japan

Continuation of Ser. No. 833,764, Feb. 11, 1992, abandoned. This application Apr. 14, 1994, Ser. No. 227,571

Claims priority, application Japan, Feb. 13, 1991, 3-020120

Int. Cl.^{6} B32B *7/00;* **D03D** *15/00;* **D04B** *1/00*

U.S. Cl. 428—259 **8 Claims**

1. A fiber-reinforced plastic material, wherein said plastic material has a composite structure for cryogenic use comprising first and second fibers as reinforcing materials, said first fiber having a positive thermal expansion coefficient and said second fiber being a polyethylene fiber and having a negative thermal expansion coefficient, and a synthetic resin as a matrix,

said plastic material exhibiting an apparent expansion or contraction controlled by any of the variations in the weight ratio, sectional-area ratio, and volume ratio of said first and second fibers,

the ratio of longitudinal moduli between said first and second fibers being substantially in reciprocal proportion to the ratio of degree of first fiber expansion or contraction to the degree of second fiber contraction or expansion, and

said fiber-reinforced plastic material being in the form of a plate-shaped member which is a laminate of woven fabrics of the first and second fibers, wherein said woven fabrics are stacked one after another with said synthetic resin as a binder,

wherein said woven fabrics include a first fabric formed from said first fiber as warps and wefts and a second fabric formed from said second fiber as warps and wefts, said first and second fabrics being alternately stacked after one another, and wherein said first and second fibers are arranged in a substantially uniform distribution within said material, and

wherein said material possesses high dimensional stability under cryogenic conditions.

5,462,792
COATING SHEET MATERIAL

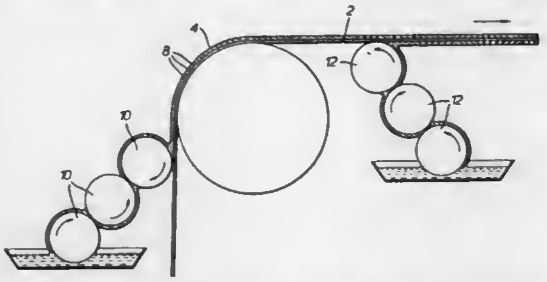
Hendrikus De Jong, Maasdam, Netherlands, assignor to Hunter Douglas International N.V., Curacao, Netherlands Antilles

Filed Jun. 30, 1993, Ser. No. 85,897

Claims priority, application United Kingdom, Jul. 1, 1992, 9214019

Int. Cl.^{6} B32B *5/06*

U.S. Cl. 428—297 **14 Claims**



1. A sheet material comprising a substrate and a cured lacquer coating on at least one surface thereof, said coating including fibers dispersed therein and forming a textured surface on said substrate.

5,462,793
STRUCTURED FIBER MATERIAL COMPRISED OF COMPOSITE FIBERS COILED AROUND CRIMPED SHORT FIBERS

Hideo Isoda, Otsu; Tadaaki Hamaguchi; Mitsuhiro Sakuda, both of Iwakuni, and Yasushi Yamada, Otsu, all of, Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka, Japan

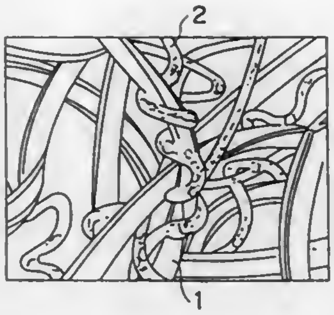
Filed Dec. 20, 1993, Ser. No. 169,642

Claims priority, application Japan, Dec. 22, 1992, 4-342577; Apr. 23, 1993, 5-097838

Int. Cl.^{6} D04H *5/00*

U.S. Cl. 428—297 **19 Claims**

1. A structured fiber material with a three-dimensional network structure comprising non-elastic crimped short fibers (A) and three-dimensionally crimped composite fibers (B), said fibers (B) being partially interlocked with each other, in which contact portions said fibers (B) are partially heat-bonded with each other; part of said fibers (B) being wound around said fibers (A) at their contact points, in which contact portions said fibers (A) and (B) are partially heat-bonded with each other; and said material having an apparent density of 0.005 to 0.10 g/cm^3; wherein said composite fiber (B) is formed to have coiled-spring shaped portions coiled around said non-elastic crimped short fiber (A) and is composed of a non-elastic polymer and a thermoplastic elastomer having a melting point that is at least 40° C. lower than the melting point of a polymer constituting said fibers (A), at least part of said thermoplastic elastomer being exposed to the outer periphery in the cross-section of said composite fiber (B).



5,462,794
FOAMED CORE-RECLAIM MULTI LAYER SHEET HAVING IMPROVED RESISTANCE TO BARRIER FILM DELAMINATION

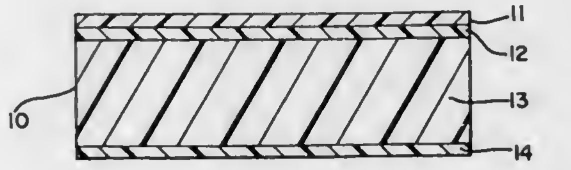
David C. Lindemann, Atlanta, Ga.; Weilong L. Chiang, Naperville; Melvin L. Luetkens, Jr., Batavia, both of Ill.; Robert D. Pischke, Duluth, and John C. Schubert, Marietta, both of Ga., assignors to Amoco Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 80,555, Jun. 21, 1993, Pat. No. 5,354,402, which is a continuation of Ser. No. 892,764, Jun. 3, 1992, Pat. No. 5,221,395, which is a division of Ser. No. 495,279, Mar. 16, 1990, Pat. No. 5,128,196. This application Jul. 30, 1993, Ser. No. 99,911

The portion of the term of this patent subsequent to Jul. 7, 2009, has been disclaimed.

Int. Cl.^{6} B32B *3/26*

U.S. Cl. 428—317.1 **44 Claims**



1. A thermoplastic multi-layer sheet comprising:

(a) a core layer of foamed thermoplastic;

(b) an oxygen barrier layer comprising a barrier resin selected from the group consisting of (i) copolymers of ethylene vinyl alcohol and (ii) polymers comprising a copolymer of acrylonitrile; and

(c) a multi-resin first layer adjacent said foamed core layer and said oxygen barrier layer, and comprising from about 5 to about 25 weight percent of at least one adhesive resin selected from the group consisting ethylene-methyl acrylate copolymer; ethylene-vinyl acetate copolymer; styrene-(ethylene-butylene)-styrene copolymer; styrene maleic anhydride copolymer; ethylene-acrylic acid copolymer; styrene-butadiene-styrene copolymer; styrene-isoprene-styrene copolymer; and polybutene;

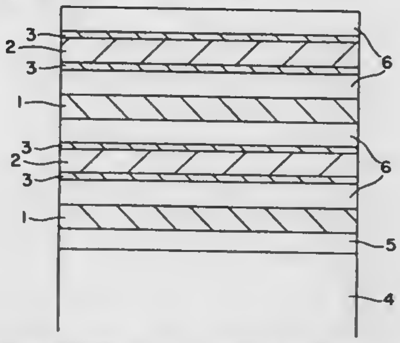
wherein said multi-resin layer is sandwiched between said foam core layer and said oxygen barrier layer, and comprises reclaim obtained from manufacturing or processing of said thermoplastic multi-layer sheet.

5,462,795

MAGNETORESISTANCE EFFECT ELEMENT

Teruya Shinjo, Uji; Hidefumi Yamamoto, Kobe; Toshihiko Anno, and Toshio Takada, both of Kyoto, all of, Japan, assignors to Ube Industries, Ltd., Yamaguchi; Nippon Steel Corporation; TDK Corporation, both of Tokyo; Tosoh Corporation, Yamaguchi; Japan Energy Corporation; NEC Corporation, both of Tokyo; Matsushita Electric Industrial Co., Ltd., Osaka, and Seisan Kaihatsu Kagaku Kenkyusho, Kyoto, all of, Japan

Filed Dec. 17, 1992, Ser. No. 992,500
Claims priority, application Japan, Dec. 24, 1991, 3-340801
Int. Cl.^{6} H01L *43/08;* B32B *5/16;* G11B *5/66*
U.S. Cl. 428—332 **2 Claims**



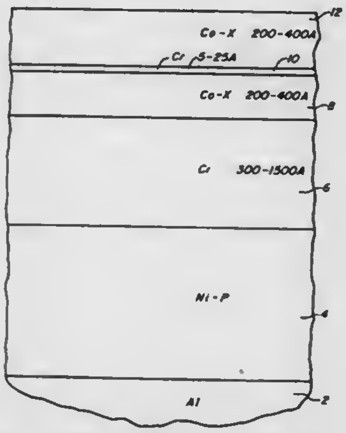
1. A magnetoresistance effect element comprising a substrate and at least two magnetic thin layers each having a thickness of from 4 to 200 Å which are laminated with interposing a non-magnetic thin layer therebetween on the same side of said substrate, wherein adjacent magnetic thin layers through the non-magnetic thin layer have different coercive forces, characterized in that a metal thin film having a thickness of from 0.5 to 50 Å is provided in an interface between at least one of the magnetic layers and the non-magnetic layer which is adjacent thereto, and the metal thin film is made of a substance which is different from that of the adjacent non-magnetic layer.

5,462,796

FLASH CHROMIUM INTERLAYER FOR IMPROVED HARD DISK MAGNETIC RECORDING PERFORMANCE

Edward Teng, and Atef H. Eltoukhy, both of Santa Clara County, Calif., assignors to StorMedia, Inc., Santa Clara, Calif.

Filed May 21, 1992, Ser. No. 887,187
Int. Cl.^{6} B32B *5/16*
U.S. Cl. 428—336 **10 Claims**



1. A magnetic recording medium comprising:

a substrate,

a first film of magnetic recording material overlying said substrate,

a discontinuous sputtered chromium layer sputter deposited directly on said first film of magnetic recording material, and

a second film of magnetic recording material overlying said discontinuous chromium layer and said first film of magnetic recording material, such that

portions of said second film of magnetic recording material are in direct contact with said discontinuous sputtered chromium layer and said first film of magnetic recording material

said discontinuous chromium layer having a thickness of about 5 to 15 angstroms.

5,462,797

ENERGY CURABLE PRESSURE-SENSITIVE ADHESIVE COMPOSITIONS

Jerry W. Williams, Cottage Grove; Robert J. DeVoe, Oakdale; Thomas P. Klun, Lakeland, all of Minn.; George F. Vesley, Hudson, Wis., and Patrick G. Zimmerman, St. Paul, Minn., assignors to Minneapolis Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 872,134, Apr. 22, 1992, abandoned, which is a continuation of Ser. No. 578,022, Sep. 5, 1990, abandoned. This application Feb. 8, 1994, Ser. No. 193,518
The portion of the term of this patent subsequent to Apr. 7, 2009, has been disclaimed.
Int. Cl.^{6} C09J *4/02;133/08;175/04;* B32B *7/12*
U.S. Cl. 428—345 **19 Claims**

1. A pressure-sensitive adhesive composition comprising the polymerization reaction product of starting materials consisting essentially of:

(a) at least one free-radically polymerizable component selected from the group consisting of an acrylate, a methacrylate, and a vinyl ester;

(b) at least one polyurethane precursor component, said polyurethane precursor component comprising: (i) a least one di- or polyisocyanate; and (ii) at least one diol or polyol;

(c) at least one organometallic complex salt; and

(d) at least one free-radical photoinitiator selected from the group consisting of acetophenones, ketals, benzophenones, aryl gyloxylates, acylphosphine oxides and peroxides;

said reaction product being obtained by sequential exposure to visible electromagnetic radiation and then to ultraviolet electromagnetic radiation.

5,462,798

BRUSH FOR APPLYING A LIQUID PRODUCT AS A LAYER ON A SUBSTRATE

Jean-Louis H. Gueret, Paris, France, assignor to L'Oreal, Paris, France

Division of Ser. No. 90,120, Jul. 21, 1993, abandoned. This application Jun. 28, 1994, Ser. No. 266,617
Claims priority, application France, Jan. 8, 1992, 92 00131
Int. Cl.^{6} D02G *3/00*
U.S. Cl. 428—364 **10 Claims**

1. A brush for applying a thick liquid cosmetic product as a layer on a substrate, comprising a multiplicity of hairs joined mechanically to a single base member, at least some of the hairs being of monofilament fiber of plastic having a diameter between 0.03 and 0.40 mm, the plastic of said fiber containing 0.2 to 15% by weight of at least one agent improving the slip characteristic of the fiber and reducing its wettability, thereby to reduce the quantity of said thick liquid cosmetic product that is retained on the brush when the brush is used to apply said thick liquid cosmetic product to said substrate.

5,462,799

CARBON FIBERS AND PROCESS FOR PREPARING SAME

Masanobu Kobayashi, Ehime; Motoi Itoh, Iyo; Yoji Matsuhisa, Ehime, and Kazuharu Shimizu, Otsu, all of, Japan, assignors to Toray Industries, Inc., Japan

Filed Aug. 22, 1994, Ser. No. 293,817

Claims priority, application Japan, Aug. 25, 1993, 5-210282; Jan. 14, 1994, 6-002582; Feb. 16, 1994, 6-019219

Int. Cl.^{6} D02G *3/00*

U.S. Cl. 428—364 **7 Claims**

1. A carbon fiber with surface oxygen concentration (O/C ratio) of 0.20 or less as measured by x-ray photoelectron spectroscopy, surface concentration of hydroxyl groups (C—OH/C ratio) of 0.5 to 3.0% as measured by chemical modification x-ray photoelectron spectroscopy and a surface concentration of carboxyl groups (COOH/C ratio) of 2.0 down to 0.2% as measured by chemical modification x-ray photoelectron spectroscopy, and comprising 0.01–10 wt % of an aliphatic compound which has multiple epoxy groups applied as a sizing agent.

5,462,800

SILICON CARBIDE COATED CARBON COMPOSITE MATERIAL AND METHOD FOR MAKING SAME

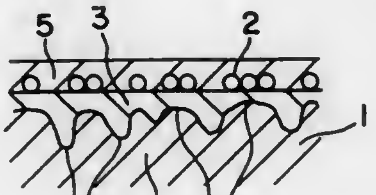
Hiraku Yamazaki, Chiba; Teruo Sugai, Tokyo; Shigeo Kato; Haruo Tazoe, both of Yamagata; Shiroh Hotate, Fuchu, and Iwao Goto, Kanagawa, all of, Japan, assignors to Toshiba Ceramics Co., Tokyo, Japan

Continuation of Ser. No. 47,375, Apr. 15, 1993, abandoned, which is a continuation of Ser. No. 773,316, Oct. 10, 1991, abandoned. This application Dec. 20, 1993, Ser. No. 169,751

Claims priority, application Japan, Jan. 11, 1990, 2-272710

Int. Cl.^{6} B01J *8/02;* **C01B** *31/02;* **D01F** *9/12;* **B32B** *9/00*

U.S. Cl. 428—408 **18 Claims**



1. A silicon carbide coated carbon composite material, comprising: (i) a base formed of a carbon composite material comprising a carbon matrix and carbon fibers, wherein said base comprises:

(a) a non-siliconized layer of said carbon composite material and

(b) a siliconized layer of said carbon composite material comprising a silicon carbide matrix formed on one surface of said carbon composite base, wherein at least a portion of the carbon fibers in said siliconized layer are not siliconized,

wherein said siliconized layer has an average thickness of from about 10 μm to about 2000 μm,

wherein said siliconized layer has a non-planar interface with the non-siliconized layer, said interface including a series of elongated protrusions of said siliconized material defined with peaks and bottoms, said peaks penetrating into the non-siliconized layer of said carbon composite base, wherein said peaks are distributed with a spacing of from about 5 μm to about 500 μm, and wherein a ratio of average distance from said one surface of the carbon composite base to the peaks, to average distance from said one surface of the carbon composite base to the bottoms is from about 1:0.2 to about 1:0.6; and

(ii) a substantially impermeable silicon carbide coating formed on said one surface of said carbon composite base, wherein said substantially impermeable silicon carbide coating has an average thickness of from about 20 μm to about 2000 μm.

5,462,801

FILTER TOW, METHOD FOR THE PRODUCTION THEREOF, AS WELL AS TOBACCO SMOKE FILTER ELEMENT AND METHOD FOR ITS PRODUCTION

Rolf Willmund, Emmendingen, Germany, assignor to Rhone-Poulenc Rhodia Aktiengesellschaft, Freiburg, Germany

Filed Jul. 21, 1993, Ser. No. 95,676

Claims priority, application Germany, Jul. 9, 1993, 43 22 967

Int. Cl.^{6} D02G *3/00;* **B32B** *23/14;23/16;23/20*

U.S. Cl. 428—372 **14 Claims**

1. A filter tow stable under conventional storage conditions but exhibiting improved biodegradation under the action of environmental influences, said filter tow consisting of cellulose acetate filaments, the filaments having a surface, on said surface an additive being present, said additive consisting of cellulose chain-splitting enzymes, the filter tow having been produced by a process which consists of the following steps:

1) spinning cellulose acetate filaments by extruding a solution of cellulose acetate having an acetyl number of at least 53% in acetone through a multi-hole spinneret to obtain spun filaments,

2) gathering a plurality of the cellulose acetate filaments from step 1) thus obtained to a filter tow and

3) subjecting said filter tow from step 2) to a hydrolysis treatment so that at least the cellulose acetate of said filaments, present on surface thereof has after the hydrolysis treatment an acetyl number of less than 53%;

4) dusting said cellulose chain-splitting enzymes on the surface of said cellulose acetate filaments.

5,462,802

POLYAMIDE HOLLOW AND/OR NON-CIRCULAR FIBER AND PROCESS FOR MAKING SAME

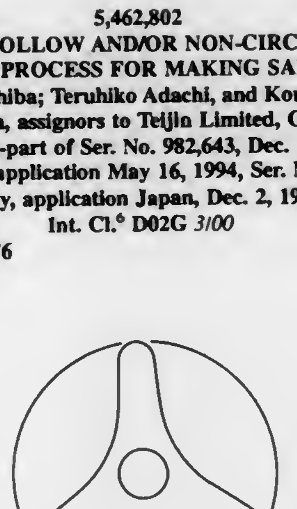
Yoshihisa Mikoshiba; Teruhiko Adachi, and Kouji Tajiri, all of Mihara, Japan, assignors to Teijin Limited, Osaka, Japan

Continuation-in-part of Ser. No. 982,643, Dec. 1, 1992, abandoned. This application May 16, 1994, Ser. No. 243,494

Claims priority, application Japan, Dec. 2, 1991, 3-341840

Int. Cl.^{6} D02G *3/00*

U.S. Cl. 428—376 **3 Claims**



1. A polyamide hollow and/or non-circular fiber comprising a metal salt of a saturated fatty acid having at least 10 carbon atoms, wherein the amount (X) of a terminal carboxyl group of the polyamide constituting the fiber is not larger than 60 gram equivalent per 1,000 kg of the polyamide and the amount (Y) (in parts by weight per 100 parts by weight of the polyamide) of the metal salt of a saturated fatty acid satisfies the following formula:

$$Y \geqq .00871X - .13$$

wherein X is the amount of the terminal carboxyl group in gram equivalent/1,000 kg of the polyamide, and the ratio of the amount of a terminal amino group to the amount of a terminal carboxyl group in the polyamide is at least 3.

5,462,803

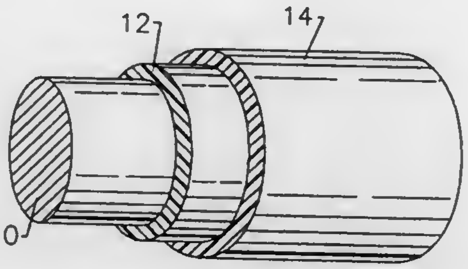
DUAL LAYER FIRE-RESISTANT PLENUM CABLE

Rob Wessels, Hickory, N.C., assignor to Comm/Scope, Catawba, N.C.

Filed May 21, 1993, Ser. No. 65,860

Int. Cl.^{6} B32B *9/00*

U.S. Cl. 428—380 **21 Claims**



1. A fire-resistant plenum cable having only two insulating layers, said cable comprising:

at least one electrical conductor;

an inner layer of a fluorocarbon copolymer containing polymer in contact with and surrounding said electrical conductor; and

an outer layer in contact with and surrounding said fluorocarbon copolymer layer, said outer layer being a layer of one abrasion resistant and flame-resistant polyvinyl chloride.

5,462,804

STABILIZED PARTICLE OF SODIUM PERCARBONATE

Jun Kokubu; Yasuo Hiro; Katsuhiko Hisano, and Susumu Watanabe, all of Mie, Japan, assignors to Mitsubishi Gas Chemical Co., Ltd., Tokyo, Japan

Filed May 6, 1994, Ser. No. 239,390

Claims priority, application Japan, May 6, 1993, 5-105551; May 6, 1993, 5-105552; Jun. 23, 1993, 5-152245

Int. Cl.^{6} B32B *5/16;* **C11D** *3/00*

U.S. Cl. 428—402.24 **39 Claims**

1. A stabilized sodium percarbonate particle comprising a sodium percarbonate particle having at least one coating layer thereon, wherein the at least one coating layer comprises:

(a) a silicate;

(b) magnesium sulfate; and,

(c) an alkali metal salt selected from the group consisting of alkali metal carbonates, alkali metal bicarbonates and alkali metal sulfates.

5,462,805

FIRE-PROTECTION AND SAFETY GLASS PANEL

Akihiko Sakamoto; Tadashi Takahashi, and Masayuki Ninomiya, all of Shiga, Japan, assignors to Nippon Electric Glass Co., Ltd., Otsu, Japan

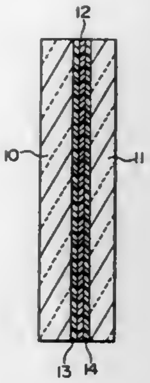
Filed Jul. 29, 1993, Ser. No. 99,226

Claims priority, application Japan, Jul. 30, 1992, 4-223470

Int. Cl.^{6} B32B *9/00*

U.S. Cl. 428—430 **14 Claims**

1. A fire-protection and safety glass panel comprising a first glass plate, a second glass plate opposite to said first glass plate, and an intermediate resin layer between said first and said second glass plates, at least one of said first and said second glass plates being a low-expansion crystallized glass plate of a low-expansion crystallized glass, wherein said intermediate resin layer comprises a polyethylene terephthalate film, a first adhesive agent layer for adhering said polyethylene terephthalate film to said first glass plate, and a second adhesive agent layer for adhering said polyethylene terephthalate film to said second glass plate, said intermediate resin layer having a thickness which is not greater than 200 μm.



5,462,806

PLASTIC LENS

Toshio Konishi, Tokyo; Toshihiko Horibe, Kanagawa; Toru Yashiro, Kanagawa; Kouji Watanabe, Kanagawa, and Toshiya Shuin, Kanagawa, all of, Japan, assignors to Nikon Corporation, Tokyo, Japan

Filed May 17, 1994, Ser. No. 243,830

Claims priority, application Japan, May 20, 1993, 5-139829

Int. Cl.^{6} B32B *13/12*

U.S. Cl. 428—451 **15 Claims**

1. A plastic lens comprising a plastic lens base material having a primer layer on at least one surface thereof and a hard coat layer on the primer layer, said primer layer having a thickness from 0.05 μm to 5 μm comprising a resin containing 5 to 40 wt % of at least one organosilicon compound represented by the following general formula (I) or a hydrolyzate thereof:

$$R^1{}_mR^2{}_nSi(OR^3)_{4-m-n} \quad (I)$$

wherein R^1 and R^2 each independently represents an alkyl group having from 1 to 20 carbon atoms, an alkenyl group having from 2 to 20 carbon atoms, an aryl group having from 6 to 19 carbon atoms, an aralkyl group having from 7 to 20 carbon atoms, or a halogen atom; R^3 represents an alkyl group having from 1 to 20 carbon atoms, an acyl group having from 2 to 20 carbon atoms, an aryl group having from 6 to 20 carbon atom, an aralkyl group having from 7 to 20 carbon atoms, wherein said alkyl, alkenyl, aryl, aralkyl and acyl groups may be substituted by a hydroxy, amino, alkoxy, aralkoxy, aryloxy, acyloxy, carbamoyloxy, alkyl, trifluoromethyl, glycidyl, aralkyl, aryl, halogen, cyano, carboxylic acid, nitro, acyl, carbamoyl, alkoxycarbamoyl, sulfanate or sulfamoyl group; and m and n are each 0 to 1.

5,462,807

HEAT SEALABLE FILMS AND ARTICLES

Richard W. Halle, Houston; Donna S. Davis, Baytown, and Charles R. Harris, Jr., Mont Belvieu, all of Tex., assignors to Exxon Chemical Patents Inc., Wilmington, Del.

Filed Aug. 20, 1993, Ser. No. 110,179

Int. Cl.^{6} B32B *27/00*

U.S. Cl. 428—500 **13 Claims**

1. A heat sealed polymeric film comprising at least two layers, the first of said layers comprising a polymer, the polymer comprising at least one alpha-olefin monomer having from 2 to 20 carbon atoms, the polymer having a MWD less than 3.0, and a M_z/M_w less than about 2.0; and a second of said layers comprising an ionomer; wherein said first and second layers are pressed together to form a seal, the seal having a peak hot tack force greater than about 2N at a sealing temperature in the range of about 80° C. to about 110° C.

5,462,808
HIGHLY RIGID COMPOSITE MATERIAL AND PROCESS FOR ITS MANUFACTURE

Kazutaka Asabe, Sanda; Masaru Nishiguchi, Ashiya, and Sukeyoshi Yamamoto, Amagasaki, all of, Japan, assignors to Sumitomo Metal Industries, Ltd., Osaka, Japan

Filed Sep. 2, 1994, Ser. No. 300,034

Claims priority, application Japan, Sep. 3, 1993, 5-220121; Sep. 3, 1993, 5-220122; Sep. 3, 1993, 5-220123; Sep. 3, 1993, 5-220124; Sep. 13, 1993, 5-227325; Sep. 13, 1993, 5-227326; Sep. 13, 1993, 5-227328

Int. Cl.^{6} B22F *3/00;* **C22C** *29/00*

U.S. Cl. 428—551 **14 Claims**

8. A high-rigidity composite material having particles dispersed in a matrix of a ferritic steel structure, with the ratio of {222} planes to {110} planes in a plane perpendicular to a given direction, in terms of X-ray diffraction intensity, being 0.10 or larger.

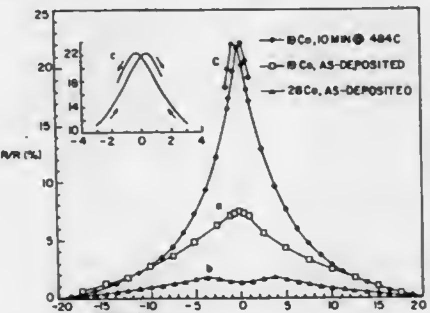
5,462,809
GIANT MAGNETORESISTANT SINGLE FILM ALLOYS

Ami Berkowitz, Del Mar, Calif., assignor to The Regents of the University of California, Alameda, Calif.

Division of Ser. No. 899,431, Jun. 16, 1992, abandoned. This application Jan. 10, 1994, Ser. No. 179,346

Int. Cl.^{6} G11B *5/00*

U.S. Cl. 428—546 **12 Claims**



1. A single layer film which exhibits giant magnetoresistance comprising:

- a substantially non-magnetic metallic matrix on a substrate; and
- a plurality of magnetic particles suspended within said substantially non-magnetic metallic matrix wherein each magnetic particle comprises a single magnetic domain having a size less than a mean free path within said magnetic particle and such that an amount of spin-dependent interfacial scattering from an outer surface of said magnetic particles is increased relative to an amount of bulk scattering within said magnetic particles to increase giant magnetoresistance in accordance with the relationship,

$$MR = \frac{4p_s^{\,2}}{(1-p_s^{\,2})^2 + 2\sigma(1+p_s^{\,2})r_{MR} + \sigma^2 r_{MR}^2},$$

where

$$\sigma = \left(\frac{1-c}{\lambda_{MX}} + \frac{c}{\lambda_{MR}} \right) / 3c\xi$$

and r_{MR} is an average radius of said magnetic particles, P_S is a spin-dependent ratio for scattering at a surface of said magnetic particles, λ_{MX} is a mean free path in said substantially non-magnetic matrix, λ_{MR} is a mean free path in said magnetic particles, ξ is a scattering strength for said surface of said magnetic particles, and c is a concentration of said magnetic particles.

5,462,810
MAGNETIC RECORDING MEDIUM

Harald Keller, Ludwigshafen; Ulrich Jaeger, Harthausen; Helmut Steininger, Worms; Helmut Kopke, Weisenheim; Klaus D. Schomann, Ludwigshafen, and Hans-Peter Schildberg, Mannheim, all of, Germany, assignors to BASF Magnetics GmbH, Mannheim, Germany

Filed Jan. 11, 1994, Ser. No. 180,074

Claims priority, application Germany, Jan. 15, 1993, 43 00 858.5

Int. Cl.^{6} G11B *5/66;5/72*

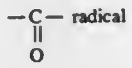
U.S. Cl. 428—694 T **7 Claims**

1. A magnetic recording medium comprising a nonmagnetic substrate and at least one ferromagnetic metal layer applied thereon and a protective layer formed on the metal layer, wherein the protective layer consists of a compound of the formula I

$$Z—(CF_2)_m—(CH_2)_n—X—Y—(CH_2)_n—(CF_2)_m—Z \qquad (I)$$

where

X is an —S— or —CHOH radical,
Y is an —S— or



$\underset{\underset{O}{\|}}{—C—}$ radical

Z is a $—CH_3$, $—CF_3$ or $—CH{=}CH_2$ radical,
n is an integer of from 2 to 17, and
m is an integer of from 0 to 7.

5,462,811
MAGNETO-OPTICAL RECORDING MEDIA AND MANGETO-OPTICAL DEVICE USING THE MEDIA

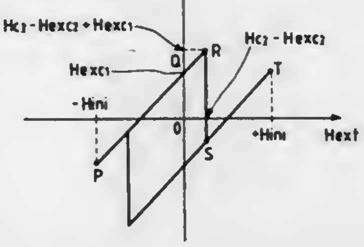
Harukazu Miyamoto, Kodaira; Makoto Miyamoto, Yokohama; Keikichi Andoo, Musashino; Toshio Niihara, Sayama, and Masahiro Ojima, Nerima, all of, Japan, assignors to Hitachi, Ltd., Tokyo, and Hitachi Maxwell, Ltd., Osaka, both of, Japan

Filed Apr. 8, 1992, Ser. No. 865,343

Claims priority, application Japan, Apr. 11, 1991, 3-078817; Jul. 23, 1991, 3-182572

Int. Cl.^{6} G11B *5/66*

U.S. Cl. 428—694 EC **14 Claims**



1. A magneto-optical recording medium comprising, on a substrate, at least a first magnetic layer made of a rare earth transition metal alloy, a second magnetic layer made of a rare earth transition metal alloy having a relatively smaller coercivity Hc_2 in Oe than that of said first magnetic layer, wherein the following relationship is satisfied at an operation temperature:

$$Hw_1 - Hexc_1 > Hc_2 - Hexc_2$$

where Hw_1 represents the magnetic domain wall coercivity of said first magnetic layer in Oe, $Hexc_1$ represents the magnitude of the exchange magnetic field exerted on said first magnetic layer in Oe and $Hexc_2$ represents the magnitude of the exchange magnetic field exerted on said second magnetic layer in Oe.

5,462,812

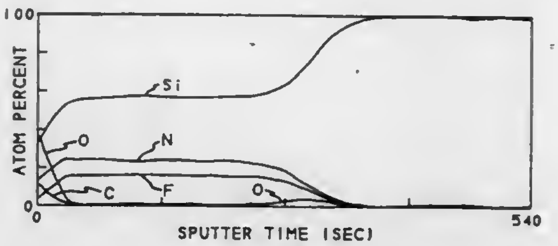
FLUORINATED SILICON NITRIDE FILMS

Son V. Nguyen, 7 Clove Ct.; David M. Dobuzinsky, 29 Shenandoah Rd., both of Hopewell Junction, N.Y. 12533; Douglas J. Dopp, 38D Winthrop Ct., Wappingers Falls, N.Y. 12590, and David L. Harmon, 72 Logwood Cir., Essex Junction, Vt. 05451

Division of Ser. No. 814,973, Dec. 24, 1991, Pat. No. 5,204,138. This application Dec. 29, 1992, Ser. No. 998,194

Int. Cl.^{6} H01L *21/318*

U.S. Cl. 428—696 6 Claims



1. A highly conformal stable fluorinated silicon nitride film containing from about 15 to about 20 atom % fluorine, and having a dielectric constant between 6.0 and 6.7, a refractive index from 1.64 to 1.80, a surface state density of from 6×10^{11} to 8×10^{11} charges/cm^2 and containing less than 1 atom % of oxygen.

5,462,813

COMPOSITE CERAMIC SINTERED MATERIAL

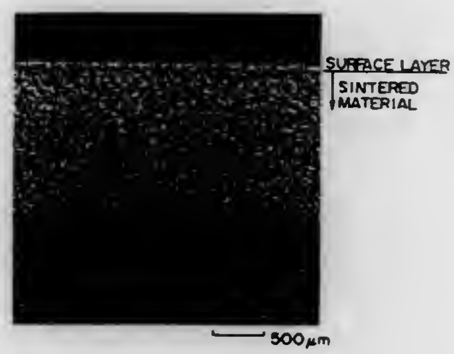
Saburou Nagano; Shuichi Tateno; Kouichi Kamitubo; Kenichi Tajima, and Masahito Nakanishi, all of Kokubu, Japan, assignors to Kyocera Corporation, Kyoto, Japan

Continuation of Ser. No. 828,773, Jan. 30, 1992, abandoned. This application Dec. 7, 1993, Ser. No. 162,796

Claims priority, application Japan, Jan. 31, 1991, 3-032269; Jan. 31, 1991, 3-032270; Jan. 31, 1991, 3-032271; Mar. 25, 1991, 3-084806; Jun. 27, 1991, 3-156826

Int. Cl.^{6} C04B *35/56*

U.S. Cl. 428—698 10 Claims



1. A composite ceramic sintered material comprising a surface layer of a composition which contains silicon nitride and carbon, and an internal portion of silicon carbide or a combination of silicon carbide, silicon nitride and carbon, the content of carbon or of silicon nitride being greater in the surface layer than in the internal portion, wherein the sintered material has a composition gradient in which the composition ratio represented by silicon carbide<(silicon carbide+silicon nitride) increases nearly continuously from the surface layer toward the internal portion.

5,462,814

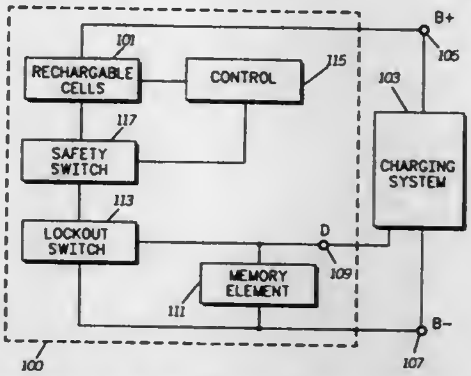
METHOD AND APPARATUS FOR PROVIDING AN ELECTRONIC LOCKOUT FOR A RECHARGEABLE BATTERY

Jose M. Fernandez, Lawrenceville, and Vernon Meadows, Lilburn, both of Ga., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 27, 1994, Ser. No. 364,566

Int. Cl.^{6} H01M *10/46;* H02J *7/10*

U.S. Cl. 429—7 7 Claims



1. A rechargeable battery including a lockout circuit located within a battery system for preventing a cell located within said battery system from being recharged with an incompatible charging system comprising:

- at least one rechargeable cell connected to a charging node and a ground node;
- a memory element connected to a data node and said ground node for conveying charging information to said battery system;
- a lockout switch connected to said at least one rechargeable cell for connecting said at least one rechargeable cell to said ground node; and
- wherein said charging system provides a voltage on said data node to control operation of said lockout switch connecting said at least one rechargeable cell to said ground node for charging said at least one rechargeable cell.

5,462,815

FUEL CELL POWER GNERATION SYSTEM AND METHOD OF CONTROLLING THE SAME

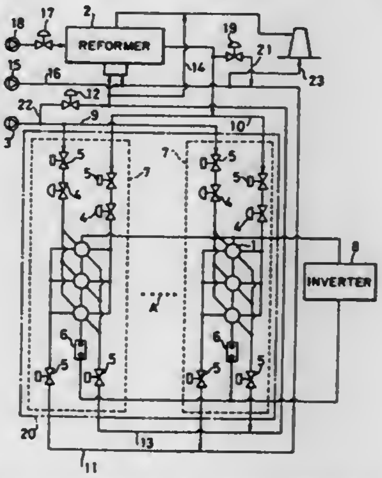
Yoshimi Horiuchi, Kawasaki, Japan, assignor to Fuji Electric Co., Ltd., Kanagawa, Japan

Filed Aug. 19, 1993, Ser. No. 108,447

Claims priority, application Japan, Aug. 20, 1992, 4-220530

Int. Cl.^{6} H01M *8/04*

U.S. Cl. 429—13 9 Claims



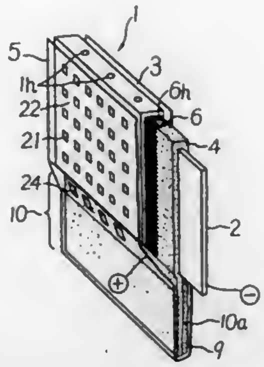
1. A fuel cell power generation system, comprising:

a fuel cell subsystem including a plurality of fuel cell stacks connected in parallel with each other, each of said fuel cell stacks comprising at least one fuel cell and a dc breaker connected in series therewith;
a source of raw fuel gas;
a raw fuel gas feed conduit for feeding said raw fuel gas;
a reformer for forming fuel gas, said reformer having first, second and third inputs, and an output, the first input being connected to said source of raw fuel gas through said raw fuel gas feed conduit;
a fuel gas feed conduit interposed between the output of said reformer and said fuel cell stacks for feeding fuel gas to said fuel cell stacks, the fuel gas feed conduit having a fuel gas shut-off valve for each of said fuel cell stacks;
a fuel gas exhaust conduit connected to said fuel cell stacks and to the second input of said reformer, said fuel gas exhaust conduit having a fuel gas exhaust shut-off valve for each of said fuel cell stacks;
a source of oxidant gas;
an oxidant gas feed conduit for connecting said source of oxidant gas to said fuel cell stacks;
an oxidant gas exhaust conduit connected to said fuel cell stacks and to the third input of said reformer, said oxidant gas exhaust conduit having an oxidant gas exhaust shut-off valve for each of said fuel cells stacks;
said reformer receiving exhaust oxidant gas and exhaust fuel gases from said oxidant and fuel gas exhaust conduits, respectively, for reforming said exhaust fuel gas into said fuel gas and feeding said fuel gas to said fuel cell subsystem;
a first bypass conduit interposed between said reformer and said fuel gas exhaust conduit, said first bypass conduit having a first flow rate control valve therein;
a second bypass conduit interposed between said oxidant gas feed conduit and said oxidant gas exhaust conduit, said second bypass conduit having a second flow rate control valve therein;
a plurality of abnormality detectors, one of said detectors being connected to each of said fuel cell stacks for detecting the output thereof, each of said abnormality detectors generating a shut-off signal when the output of the fuel cell stack to which it is connected decreases to an amount below which the total load on said source of oxidant gas and on said reformer has reached a predetermined minimum value required for operation of said power generation system, said shut-off signal shutting the fuel gas, fuel gas exhaust, oxidant gas and oxidant gas exhaust shut-off valves, operating said first flow rate control valve to bypass a part of the fuel gas from said reformer to said fuel gas exhaust conduit, operating said second flow rate control valve to bypass a part of the oxidant gas from said source of oxidant gas to said oxidant gas exhaust conduit, and opening the dc breaker of the fuel cell stack connected to the abnormality detector which generated said shut-off signal; and
an inverter electrically connected in parallel with said at least one fuel cell of each of said fuel cell stacks, through said dc breaker, for converting a DC output of said fuel cells to an AC output.

5,462,816
AIR CELL

Okiyoshi Okamura, Hiroshima; Katsuma Sakai, and Mitsunori Yoshimura, both of Yamaguchi, all of, Japan, assignors to Koa Oil Company, Ltd., Tokyo, Japan
Filed Oct. 27, 1994, Ser. No. 329,880
Claims priority, application Japan, Jan. 29, 1993, 5-272502
Int. Cl.^{6} H01M *8/24*

U.S. Cl. 429—18 **11 Claims**

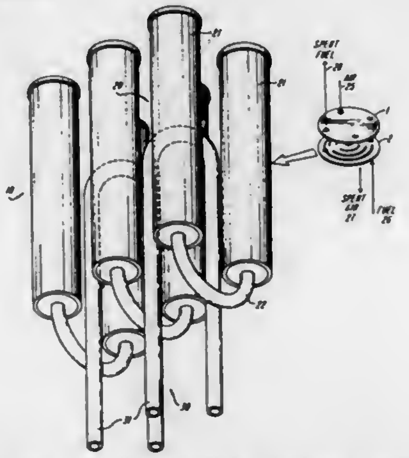


1. An air cell having a single cell, comprising:
a positive electrode;
a negative electrode;
a separator disposed between said positive electrode and said negative electrode and composed of a water absorbing material that absorbs and holds an electrolytic solution;
an electrolytic solution supply member protrusively disposed at a lower edge of said positive electrode and said negative electrode and which supplies the electrolytic solution to said separator;
a spacer for covering an outer surface of said positive electrode and said negative electrode and forming an air layer on the front surface thereof; and
a cover member for covering surfaces of said electrolytic solution supply member, said cover member having a blank portion that is at least a minimum opening portion for supplying the electrolytic solution to said electrolytic solution supply member.

5,462,817
RADIANT THERMAL INTEGRATION WITH REGENERATIVE HEATING IN A HIGH TEMPERATURE ELECTROCHEMICAL CONVERTER

Michael S. Hsu, Roundhill Rd., Lincoln, Mass. 01773
Continuation-in-part of Ser. No. 981,200, Nov. 25, 1992, abandoned. This application Nov. 24, 1993, Ser. No. 157,749
Int. Cl.^{6} H01M *8/06*

U.S. Cl. 429—19 **17 Claims**



1. A high efficiency electrochemical converter system, said system comprising:
an electrochemical converter assembly having a plurality of converter elements disposed in columns, said converter assembly including reactant supply means for supplying reactants to said electrochemical converter assembly, and exhaust means for removing exhaust gases,
electricity extraction means for extracting an electrical current from said assembly,
regenerative heat exchange means coupled to one end of said converter assembly for heating said reactants prior to introduction to said converter assembly to a selected operating temperature while simultaneously cooling said exhaust to

effectuate a balanced thermal energy transfer between said incoming reactants and said outgoing exhaust gases such that the heat energy transferred from said exhaust to said incoming reactants is approximately equal to the heat absorbed by said reactants, and

an integrated heat transfer assembly having a plurality of heat transfer elements for transport of a working medium, said heat transfer elements being disposed between said electrochemical converter elements without contacting said converter elements to provide efficient temperature regulation thereof and serving to remove waste heat by radiant heat transfer from said columnar converter elements to said heat transfer elements, said heat transfer assembly being adapted to couple said waste heat to a bottoming thermodynamic device thereby substantially reducing the need for applying a supplemental cooling mass flow through said electrochemical converter elements to remove waste heat therefrom.

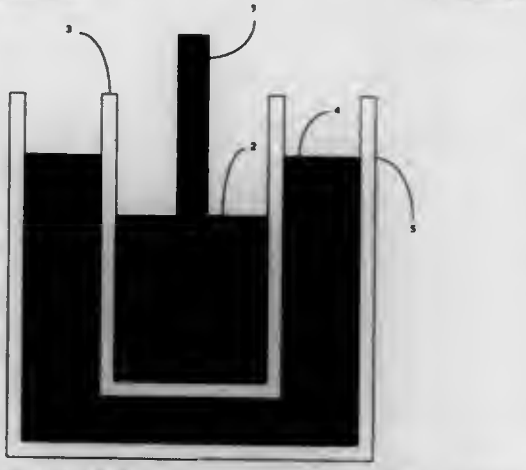
5,462,818
HIGH TEMPERATURE SODIUM-GRAPHITE ELECTROCHEMICAL CELL

Edward J. Plichta, Howell, and Wishvender K. Behl, Ocean, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 8, 1994, Ser. No. 336,149

Int. Cl.^{6} H01M *6/30*

U.S. Cl. 429—104 **4 Claims**



4. A high temperature electrochemical cell including a liquid alkali metal containing material selected from the group consisting of liquid sodium and liquid low melting alloys of sodium as the anode, an alkali metal ion conducting solid electrolyte separator and a mixture of graphite and molten alkali metal tetrachloroaluminate as the cathode, and wherein the cathode mixture is 20 weight percent graphite and 80 weight percent molten alkali metal tetrachloroaluminate.

5,462,819
RECHARGEABLE ALKALINE ROUND CELL HAVING HOT MELT BARRIER

Robert J. Jacus, Madison; James A. Senn, Platteville, and Kenneth R. Kusel, Dodgeville, all of Wis., assignors to Rayovac Corporation, Madison, Wis.

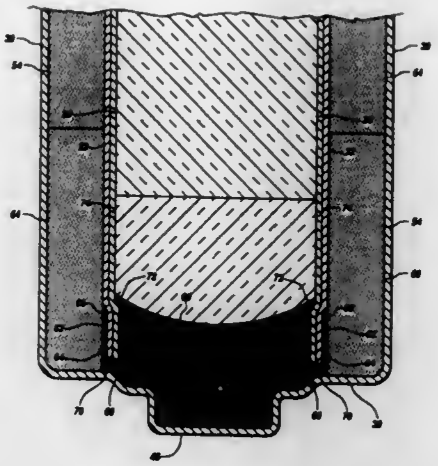
Continuation-in-part of Ser. No. 968,896, Oct. 30, 1992, Pat. No. 5,324,332. This application Jun. 10, 1994, Ser. No. 257,569

Int. Cl.^{6} H01M *2/16*

U.S. Cl. 429—174 **5 Claims**

1. A rechargeable alkaline manganese dioxide round cell, comprising:

(a) a cylindrical metal container comprising a closed first end forming a bottom, an initially open second end, and upstanding sidewalls, the bottom and upstanding sidewalls having inner surfaces, the container forming a positive current collector;



(b) a cylindrically-shaped annular cathode disposed within the container and comprising manganese dioxide, the cathode having outer and inner peripheral sidewalls, the outer peripheral sidewalls being disposed propinquant to the inner surface of the upstanding sidewalls, the inner peripheral sidewalls forming a central cylindrically shaped void, the bottommost portion of the void forming a space;

(c) a cylindrically-shaped anode having outer peripheral sidewalls and comprising gelled zinc, the anode being disposed within the void;

(d) a cylindrically-shaped separator having a bottom edge, an inner sidewall, and an outer sidewall, the separator being disposed between the outer peripheral sidewalls of the anode and the inner peripheral sidewalls of the cathode, the bottom edge being disposed within the space; and

(e) a hot melt barrier disposed in the bottom of the container and completely occupying the space, the barrier engaging and surrounding completely the bottom edge and portions of the inner and outer separator sidewalls propinquant to the bottom edge, the barrier forming a seal for inhibiting the occurrence of electrical shorts between the anode and the cathode, the barrier comprising an undifferentiated, substantially homogeneous solid hot melt material at room temperature, the hot melt material being an undifferentiated, substantially homogenous, form-fitting liquid at temperatures exceeding its melting temperature.

5,462,820
NON-AQUEOUS BATTERY WITH A BLOCK COPOLYMER SEALING MEMBER

Mitsutoshi Tanaka, Minami-ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

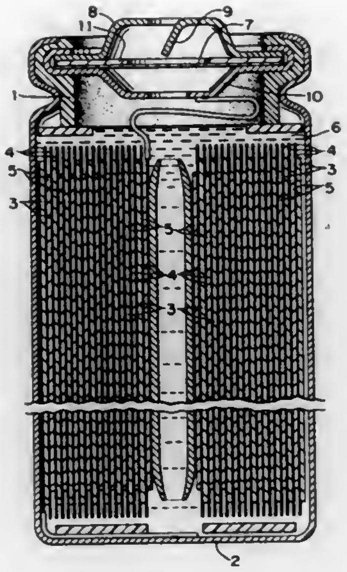
Filed Nov. 1, 1994, Ser. No. 333,301

Claims priority, application Japan, Nov. 2, 1993, 5-274638

Int. Cl.^{6} H01M *2/08*

U.S. Cl. 429—174 **20 Claims**

1. A non-aqueous battery which comprises a positive electrode, a negative electrode and a non-aqueous electrolyte as well as a battery can serving as a negative electrode-terminal and a sealing terminal serving as a positive electrode-terminal which are crimp-sealed through a gasket comprising a polyolefin resin, wherein the polyolefin resin comprises a block copolymer of propylene and ethylene having an ethylene copolymerization rate ranging from 2 to 20% by weight and a modulus in flexure ranging from 12000 to 18000 kg/cm^2.



5,462,821

GALLIUM BASED ACTIVE MATERIAL FOR THE NEGATIVE ELECTRODE, A NEGATIVE ELECTRODE USING THE SAME, AND BATTERIES USING SAID NEGATIVE ELECTRODE

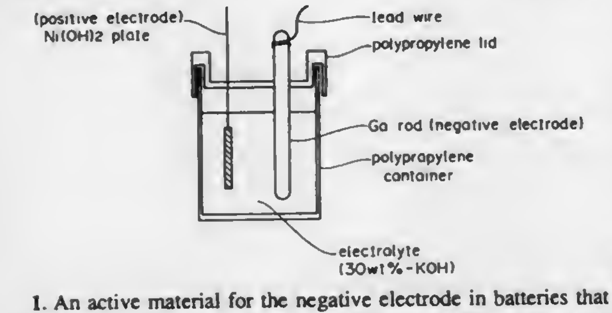
Takashi Onoue; Kiyoshi Araki; Noriya Ishida; Toshiya Kitamura; Yasuhiko Niitsu; Makiko Yanagisawa; Ryo Sakamoto, and Fumihiro Sato, all of Tokyo, Japan, assignors to Dowa Mining Co., Ltd., Tokyo, Japan

Filed Nov. 16, 1994, Ser. No. 340,725

Claims priority, application Japan, Nov. 19, 1993, 5-314185; Feb. 18, 1994, 6-044887; Aug. 10, 1994, 6-209279; Aug. 25, 1994, 6-224194; Sep. 3, 1994, 6-234381; Sep. 13, 1994, 6-244701

Int. Cl.^{6} H01M *4/58;* **G01N** *27/26*

U.S. Cl. 429—218 **10 Claims**



1. An active material for the negative electrode in batteries that contains metallic gallium, a gallium alloy or a gallium compound as a principal component.

5,462,822

PHOTOGRAPHIC PRINT MATERIAL SUITED FOR THE PRODUCTION OF A MULTICOLOUR LIQUID CRYSTAL DISPLAY

Raymond Roosen, 's-Gravenwezel; Herman Van Gorp, Tielen, and Marcel Monbaliu, Mortsel, all of, Belgium, assignors to AGFA-GEVAERT N. V., Mortsel, Belgium

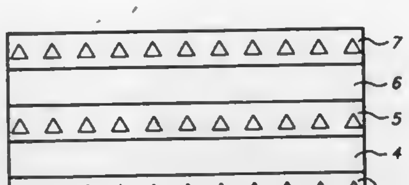
Filed Feb. 17, 1994, Ser. No. 197,879

Claims priority, application Germany, Mar. 11, 1993, 93 20 0707.3

Int. Cl.^{6} G03C *9/00;* **C09K** *19/02*

U.S. Cl. 430—7 **4 Claims**

1. A multicolor liquid crystal imaging device comprising in a sealed gap between glass plates, each provided with an electrode or electrode structure, a liquid crystal layer and a multicolor filter array element which comprises supported on one of said glass plates a pixelwise exposed and color-processed multicolor silver halide layer assemblage, said filter array element being arranged in said multicolor liquid crystal display device with the glass support thereof directed away from said liquid crystal layer, said assemblage containing yellow pixels in an originally before processing blue light sensitive emulsion layer (1) containing a yellow dye forming color coupler, magenta pixels in an originally before processing green light sensitive emulsion layer (2) containing a magenta dye forming color coupler, and containing cyan pixels in an originally before processing red light sensitive emulsion layer (3) containing a cyan dye forming color coupler, said layer (3) being the emulsion layer most remote from the glass plate supporting said assemblage, and which pixels are in superposition according to the principles of subtractive color photography to yield a color matrix (mosaic) of blue, green and red pixels, a thermally cured organic resin layer over said emulsion layer containing said cyan pixels to form a water-impermeable covering layer over the assemblage, the thermal curing of said resin being at a temperature in the range of 50° to 200° C., a transparent electrode layer on top of the cured resin layer, and a resinous alignment layer on top of said transparent electrode layer.



5,462,823

MAGNETIC RECORDING MATERIALS PROVIDED WITH A PHOTOSENSITIVE LAYER

Christopher M. Evans; Mark R. Buckingham, both of Essex, and Colin F. Norman, Hertfordshire, all of, England, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

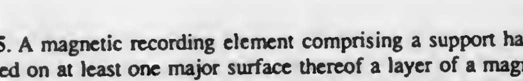
Filed Nov. 15, 1993, Ser. No. 152,811

Claims priority, application United Kingdom, Nov. 16, 1992, 9224003

The portion of the term of this patent subsequent to Feb. 14, 2012, has been disclaimed.

Int. Cl.^{6} G11B *13/04*

U.S. Cl. 430—14 **24 Claims**



15. A magnetic recording element comprising a support having coated on at least one major surface thereof a layer of a magnetic recording medium and a photosensitive layer, which may be separate from or integral with the magnetic recording layer, wherein exposure of the photosensitive layer to activating actinic radiation causes generation or destruction of an infrared radiation absorbing dye or promotes or inhibits the generation or destruction of an infrared radiation-absorbing dye upon heat development.

5,462,824

SILVER HALIDE PHOTOGRAPHIC MATERIAL

Fumio Kawamoto; Yoshiki Sakaino, both of Kanagawa, and Shohei Yoshida, Shizuoka, all of, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 2, 1993, Ser. No. 160,160

Claims priority, application Japan, Dec. 3, 1992, 4-349977; Jan. 5, 1993, 5-015928; Feb. 26, 1993, 5-038190; Apr. 27, 1993, 5-122201

The portion of the term of this patent subsequent to Nov. 29, 2011, has been disclaimed.

Int. Cl.^{6} G03C *1/795*

U.S. Cl. 430—501 **19 Claims**

1. A silver halide photographic material comprising at least one silver halide emulsion layer on a support and wound in a roll form, wherein the support is a biaxially oriented polyester containing at least 70% by mole of naphthalenedicarboxylic acid and ester thereof as a dicarboxylic acid component, and having a loss elastic modulus of 0.01 to 0.1, a Young's modulus of 530 to 670 kg/mm^2, a breaking elongation of 60% to 200%, a crystallinity of 0.3 to 0.5, and a ratio of refraction indexes of film width to film thickness of 1.10 to 1.22.

5,462,825

ELECTROPHOTOGRAPHIC PHOTOCONDUCTOR HAVING A PHOTOSENSITIVE LAYER WITH CHARGE GENERATING PARTICLES AND A CHARGE TRANSPORTING MATERIAL DISPERSED IN A BINDER

Masashi Tanaka; Toshiyuki Fukami; Masato Katsukawa, and Hideo Nakamori, all of Osaka, Japan, assignors to Mita Industrial Co., Ltd., Japan

Filed Nov. 12, 1993, Ser. No. 151,297

Claims priority, application Japan, Nov. 16, 1992, 4-305613

Int. Cl.^{6} G03G *5/06*

U.S. Cl. 430—58 **7 Claims**

1. An electrophotographic photoconductor comprising:

a conductive substrate and a photosensitive layer formed on the conductive substrate,

wherein the photosensitive layer comprises charge generating particles, a charge transporting material, and a binder resin, and the charge generating particles are made of a composition comprising an organic charge generating material dispersed in a binding medium, and

wherein the charge generating particles are comprised in the photosensitive layer in an amount of 1 to 30 parts by weight per 100 parts by weight of the binder resin.

5,462,826

CHARGE TRANSPORTING MATERIALS AND ELECTROPHOTOGRAPHIC PHOTOCONDUCTORS USING THE SAME

Tomoyuki Shimada, Numazu; Masaomi Sasaki, Susono; Mitsuru Hashimoto, and Tamotsu Aruga, both of Numazu, all of, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Division of Ser. No. 77,968, Jun. 18, 1993, Pat. No. 5,298,661, which is a continuation of Ser. No. 817,975, Jan. 8, 1992, abandoned, which is a continuation of Ser. No. 442,533, Nov. 28, 1989, abandoned, which is a continuation-in-part of Ser. No. 260,063, Oct. 20, 1988, Pat. No. 4,898,800. This application Feb. 17, 1994, Ser. No. 197,854

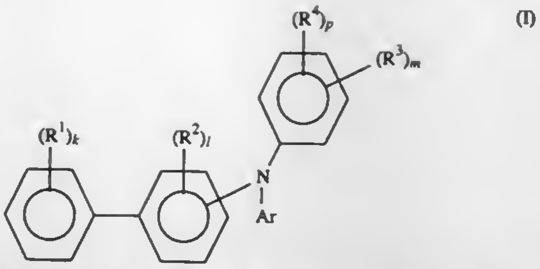
Claims priority, application Japan, Jan. 27, 1989, 1-18698; Jan. 27, 1989, 1-18699

The portion of the term of this patent subsequent to Jun. 15, 2010, has been disclaimed.

Int. Cl.^{6} G03G *5/04*

U.S. Cl. 430—59 **41 Claims**

1. A charge transporting material, comprising one or more compounds having the formula (I):



(I)

wherein R^1 represents hydrogen; an unsubstituted or substituted alkyl group; an alkoxyl group having 1 to 4 carbon atoms; a thioalkoxyl group having 1 to 4 carbon atoms; an aryloxy group; an aralkyl group; a nitro group; an unsubstituted or substituted aryl group; a halogen; an amino group; an unsubstituted or substituted dialkylamino group; R^2 represents hydrogen; an unsubstituted or substituted alkyl group; an alkoxyl group having 1 to 4 carbon atoms; or a halogen; R^3 represents hydrogen; an alkyl group having 1 to 4 carbon atoms; an alkoxyl group having 1 to 4 carbon atoms; a halogen; a dialkylamino group; an amino group; a thioalkoxyl group having 1 to 4 carbon atoms; an aryloxy group; a methylenedioxy group; an aralkyl group; or an unsubstituted or substituted aryl group; R^4 represents hydrogen; an unsubstituted or substituted alkyl group; an alkoxyl group; or a halogen; Ar represents an unsubstituted or substituted monocyclic hydrocarbon group, non-condensed polycyclic hydrocarbon group or heterocyclic group; k is an integer of 0 to 5, l is an integer of 0 to 4, and (p+m) is 0 to 5, provided that when Ar is an unsubstituted phenyl group, R^1, R^2, R^3, and R^4 cannot be hydrogen at the same time.

5,462,827

ELECTROPHOTOGRAPHIC PHOTORECEPTOR AND ELECTROPHOTOGRAPHIC PROCESS

Shigeru Yagi; Masato Ono; Taketoshi Higashi; Tsuyoshi Ohta, and Yuzuru Fukuda, all of Minami Ashigara, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Jan. 18, 1994, Ser. No. 184,193

Claims priority, application Japan, Jan. 20, 1993, 5-023422

Int. Cl.^{6} G03G *5/14*

U.S. Cl. 430—65 **8 Claims**

1. A negative-charging electrophotographic photoreceptor comprising an electrically conductive support having consecutively thereon (a) a charge injection prevention layer having a thickness of from 0.15 to 10 μm, (b) a photoconductive layer, and (c) a surface layer,

said charge injection prevention layer (a) comprising amorphous silicon containing at least one of a hydrogen atom and a halogen atom, and containing a nitrogen atom in an atomic ratio of from 0.01 to 0.65 to the silicon atom,

said photoconductive layer (b) comprising amorphous silicon containing at least one of a hydrogen atom and a halogen atom.

5,462,828

STYRENE/N-BUTYL ACRYLATE TONER RESINS WITH EXCELLENT GLOSS AND FIX PROPERTIES

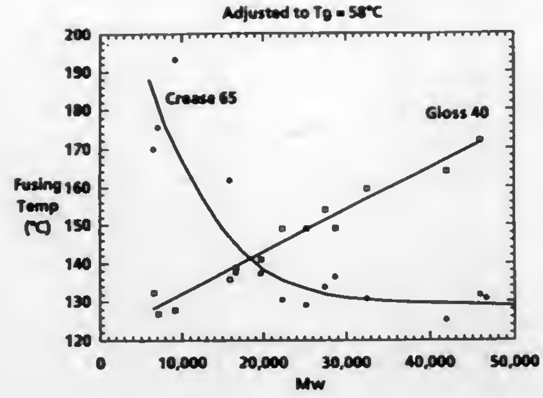
Karen A. Moffat, Brantford; Fatima M. Pontes; Anthony J. Paine, both of Mississauga; Brian McAneney, Burlington, and Paul Puri, Brampton, all of, Canada, assignors to Xerox Corporation, Stamford, Conn.

Filed Jun. 22, 1994, Ser. No. 264,210

Int. Cl.^{6} G03G *9/087*

U.S. Cl. 430—106 **17 Claims**

1. A toner composition comprising a monomodal styrene butyl acrylate polymer resin and a colorant, wherein said toner resin has a number average molecular weight of from about 1,000 to about



5,000, a weight average molecular weight of from about 10,000 to about 40,000 and a molecular weight distribution of greater than 6.

5,462,829

POLYMER BLENDS AND TONER COMPOSITIONS COMPRISING SAME

Dinesh Tyagi, Fairport, and Louis J. Sorriero, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 21, 1993, Ser. No. 171,488
Int. Cl.^{6} G03G *9/087*

U.S. Cl. 430—109 **18 Claims**

1. A thermoplastic polymer composition comprising a homogeneous blend of

(a) a major amount of a linear or branched matrix polymer, said polymer being a polyester having a number average molecular weight of at least 2,000 or a vinyl polymer having a number average molecular weight of at least 3,000, and

(b) a minor amount of a block copolymer of AB or ABA type wherein A is a homopolymer block which is compatible with said matrix polymer and B is a homopolymer block which is incompatible with said matrix polymer,

said blend having a fusing temperature of not more than 250° C., a melt viscosity of from about 4×10^2 to 5×10^4 poise as measured on a Rheometrics Dynamic Analyzer at 150° C. and a frequency of 1 rad/sec and a melt elasticity of from about 1.5×10^2 to 4×10^4 dynes/cm^2.

5,462,830

RESIN COMPOSITION FOR A TONER FOR AN ELECTROPHOTOGRAPHY AND THE TONER COMPRISED THE SAME

Hideyuki Kubota; Mitsuaki Horiike, both of Shizuoka, and Toshiharu Furukawa, Suita, all of, Japan, assignors to Tomoegawa Paper Co., Ltd., Tokyo, and Sekisui Chemical Co., Ltd., Osaka, both of, Japan

Filed Dec. 13, 1994, Ser. No. 357,276
Claims priority, application Japan, Dec. 13, 1993, 5-341175
Int. Cl.^{6} G03G *9/097*

U.S. Cl. 430—110 **4 Claims**

1. A resin composition for a toner comprising a polymer made of styrene/(meth)acrylic ester copolymers, a thermoplastic polyesterurethane resin having a weight average molecular weight in a range of 5,000 to 500,000, and a vegetable wax having a melting point in a range of 65° to 90° C.

5,462,831

PROCESSING OF SILVER HALIDE PHOTOGRAPHIC INDUSTRIAL X-RAY FILMS

Benedictus Jansen, Geel; André Roefs, Kasteriee; Francis Sels, Kontich; Pieter Perdieus, O.L.V. Waver, and Raymond Florens, Edegem, all of, Belgium, assignors to Agfa-Gevaert, N.V., Mortsel, Belgium

Filed Apr. 5, 1994, Ser. No. 223,426
Claims priority, application European Pat. Off., Apr. 13, 1993, 93201074
Int. Cl.^{6} G03C *5/16*

U.S. Cl. 430—139 **10 Claims**

1. Method of image formation in a silver halide industrial X-ray photographic material, comprising on at least one side of a support, at least one gelatino silver bromide or bromoiodide emulsion layer and a total amount of silver halide, corresponding to from 6 to 20 g of silver nitrate per square meter and per side, and at least one non-sensitive protective antistress coating by the steps of exposing said material to direct X-rays and processing the material in an automatic processing machine by development, fixing, rinsing and drying, characterized in that said material further comprises at least one hardening agent different from a vinyl sulphone compound and at least one polyoxyalkylene compound, said at least one polyalkylene compound being the condensation product of castor oil add polyethylene oxide with 40 recurrent units, in at least one of its hydrophilic layers, and that development occurs in a developer comprising as a surfactant at least one anionic alkylphenoxy and/or alkoxy polyalkyleneoxy phosphate ester, sulphate ester, alkyl carboxylic, sulphonic or phosphonic acid and/or a salt thereof.

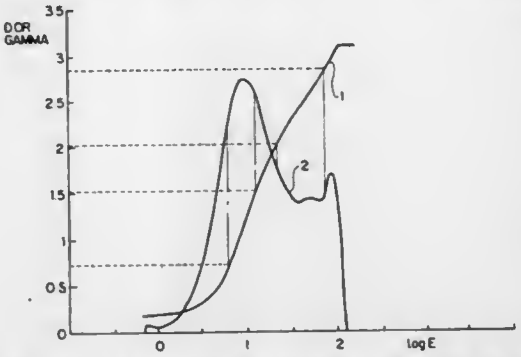
5,462,832

METHOD OF FORMING RADIATION IMAGES AND SILVER HALIDE PHOTOGRAPHIC MATERIAL THEREFOR

Nobuyuki Iwasaki, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 12, 1994, Ser. No. 274,025
Claims priority, application Japan, Jul. 14, 1993, 5-174384
Int. Cl.^{6} G03C *5/16*

U.S. Cl. 430—139 **13 Claims**



1. A method of forming radiation images comprising the steps of:

exposing a radiation image-forming system to radiation, said radiation image-forming system comprising a silver halide photographic material having at least one light-sensitive silver halide emulsion layer on each side of a transparent support and two radiation-intensifying screens respectively arranged on the front and the back sides of said photographic material, said photographic material having a crossover rate of at most 15% with respect to the light emitted from said intensifying screens; and

developing said exposed photographic material to form a radiation image, wherein said developed photographic material has a characteristic curve such that when drawn using crossed coordinates equal to each other in unit length, with diffusion density as ordinate (Y-axis) and common logarithm of exposure amount as abscissa (X-axis), the characteristic curve provides a point gamma value ranging from 1.8 to 3.0 at every point within the optical density range of 0.7 to 1.5 and a point gamma value ranging from 1.2 to 2.0 at every point within the optical density range of 2.0 to 2.8.

5,462,833

LITHOGRAPHIC BASE AND A METHOD FOR MAKING A LITHOGRAPHIC PRINTING PLATE THEREWITH

Guido Hauquier, Nijlen; Willem Cortens, Booischot; Paul Coppens, Turnhout; Joan Vermeersch, Deinze; Erik Mostaert, Boechout, and Eric Verschueren, Merksplas, all of, Belgium, assignors to Agfa-Gevaert, N.V., Mortsel, Belgium

Filed Mar. 9, 1994, Ser. No. 207,709

Claims priority, application European Pat. Off., Apr. 5, 1993, 93200969

Int. Cl.^{6} G03C *1/93;* **G03F** *7/016*

U.S. Cl. 430—159 **8 Claims**

1. A lithographic base comprising on a hydrophobic support a subbing layer contiguous to a hydrophilic layer containing a hydrophilic (co)polymer or (co)polymer mixture and being hardened with a hydrolyzed tetraalkyl orthosilicate crosslinking agent characterized in that said subbing layer contains a hydrophilic binder and silica, the surface area of the silica being at least 300 m^2 per gram.

5,462,834

WATER BASED VARNISH FOR PRODUCTION OF COLORED IMAGES

Edward L. Weller, Jr., 1959 Robin Crest La., Glenview, Ill. 60025; Edward J. Renkor, 2 N. 565 Pearl Ave., Lyn Ellyn, Ill. 60137, and Edward L. Weller, III, 1959 Robin Crest La., Glenview, Ill. 60025

Continuation of Ser. No. 681,556, Apr. 5, 1991, abandoned, which is a continuation-in-part of Ser. No. 337,295, Apr. 13, 1989, abandoned, which is a continuation-in-part of Ser. No. 197,681, May 5, 1988, abandoned, which is a division of Ser. No. 867,956, May 29, 1986, Pat. No. 4,748,102. This application Jan. 6, 1994, Ser. No. 178,466

Int. Cl.^{6} G03F *7/021*

U.S. Cl. 430—176 **5 Claims**

1. An acidic water-based varnish for use in the production of colored images on a backing from a transparent negative image comprising: water, a water-based color pigment dispersed in said water to form a dispersion, said pigment having an original color, which is color matched to a prescribed color, sufficient dispersed organic resin to form a colored film on drying, and an aromatic diazo compound that will cross-link with said organic resin upon exposure to actinic light, said pigment being present in greater quantity by weight than said compound, such that the color of said varnish after exposure to actinic light and after drying is substantially the same color as said prescribed color.

5,462,835

PHOTOCURABLE COMPOSITION, FLEXIBLE, PHOTOSENSITIVE ARTICLES MADE THEREFROM, AND METHODS OF IMPROVING SOLVENT RESISTANCE AND FLEXIBILITY OF THOSE ARTICLES

Srinivas K. Mirle, Ellicott City, Md., and Trevor J. Williams, Mableton, Ga., assignors to P T Sub Inc., Wilmington, Del.

Filed Sep. 16, 1991, Ser. No. 760,430

Int. Cl.^{6} G03C *1/73*

U.S. Cl. 430—287 **17 Claims**

1. A photocurable composition comprising

(a) a solid butadiene/methacrylic acid copolymer having an acid ephr of at least 0.2, and

(b) a liquid acid-containing polymer having a weight average molecular weight of about 1000 to 10,000 suitable for flexibilizing the photocurable composition when cured, wherein said liquid acid-containing polymer has at least one free ethylenically unsaturated group and is the reaction product of a liquid butadiene/methacrylic acid copolymer and glycidyl methacrylate, or said liquid acid-containing polymer is the reaction product of (i) a hydroxy-terminated polybutadiene, (ii) maleic anhydride, and (iii) a compound having a free ethylenically unsaturated group and a free acid reactive group, and wherein the liquid acid-containing polymer (b) is further reacted with an anhydride.

5,462,836

METHOD OF MANUFACTURING A FLEXOGRAPHIC PRINTING PLATE

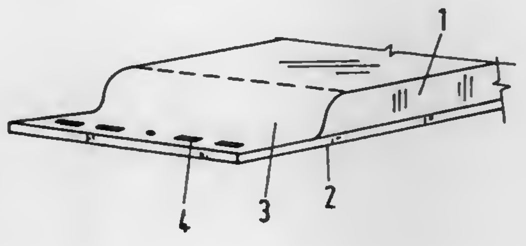
Manfred Hornschuh, Hauptstrasse 4, D-49174 Hilter, Germany

Filed Mar. 15, 1994, Ser. No. 212,969

Claims priority, application Germany, Mar. 16, 1993, 43 09 258.6

Int. Cl.^{6} G03F *7/00*

U.S. Cl. 430—306 **5 Claims**



1. A method of manufacturing a flexographic printing plate, the printing plate having a base, a soft caoutchouc mass enriched with photo-initiators, the caoutchouc mass being arranged on the base, and a film with the image to be printed being fastened on the caoutchouc mass with a precise fit, the method comprising removing the caoutchouc mass at edges of the base intended for fastening the film, providing the edges of the base from which the caoutchouc mass has been removed with register holes and placing the base with the register holes on register pins of an assembly rail, placing spacer pieces on the edges of the base from which the caoutchouc mass has been removed, wherein the thickness of the spacer pieces corresponds to the thickness of the removed caoutchouc mass, placing the film having corresponding register holes on the register pins, and finally carrying out exposure to light and rinsing of the film.

5,462,837

METHOD OF FABRICATING HIGH DENSITY PRINTED CIRCUIT BOARD

Masahiro Yamaguchi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Sep. 1, 1994, Ser. No. 299,406

Claims priority, application Japan, Sep. 3, 1993, 5-219365

Int. Cl.^{6} G03F *7/20*

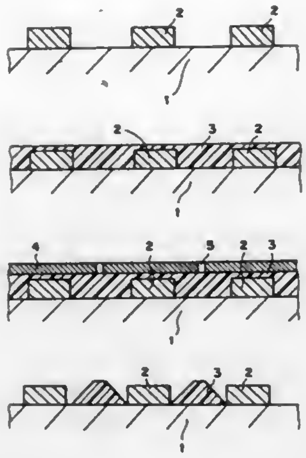
U.S. Cl. 430—311 **10 Claims**

1. A method of fabricating a printed circuit board, comprising the steps of:

forming on a substrate a circuit pattern including pads;

applying a solder resist on said substrate and said circuit pattern; and

exposing said solder resist between said pads using scattered light and a mask film which has light transmission portions.



5,462,838
METHOD FOR MANUFACTURING A CURVED SURFACE MULTI-LAYER WIRING BOARD

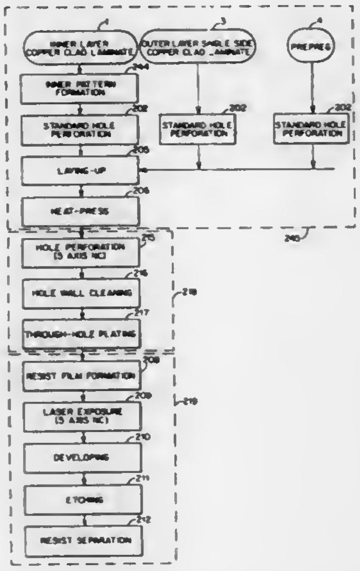
Masahito Sato; Kazuaki Tajima; Yoshio Matsuda, and Takahumi Miyamoto, all of Kanagawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 841,319, Feb. 25, 1992, abandoned. This application Nov. 15, 1993, Ser. No. 152,507

Claims priority, application Japan, Mar. 6, 1991, 3-040048; Jan. 15, 1991, 3-266153

Int. Cl.^{6} G03F *7/00;* **H05K** *3/06*

U.S. Cl. 430—313 **24 Claims**


INNER LAYER COPPER CLAD LAMINATE
OUTER LAYER SINGLE SIDE COPPER CLAD LAMINATE
PREPREG
INNER PATTERN FORMATION
STANDARD HOLE PERFORATION
STANDARD HOLE PERFORATION
STANDARD HOLE PERFORATION
LAYING-UP
HEAT-PRESS
HOLE PERFORATION (5 AXIS NC)
HOLE WALL CLEANING
THROUGH-HOLE PLATING
RESIST FILM FORMATION
LASER EXPOSURE (5 AXIS NC)
DEVELOPING
ETCHING
RESIST SEPARATION
3
4
244
202
202
202
205
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240
215
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1. A method for manufacturing a curved surface multi-layer wiring board comprising the steps of:

laying together (i) flat inner layer substrates in which standard holes are perforated and on which inner patterns are formed on an inner layer single side copper clad laminate, (ii) flat outer layer substrates in which standard holes are perforated in an outer layer single side copper clad laminate, and (iii) a flat prepreg in which standard holes are perforated;

positioning the substrates and the prepreg in a curved formation mould having heating elements formed therein; and

heating and pressing the substrates and the prepreg in the mould to form a wiring board with a curved surface having a copper clad laminate.

5,462,839
PROCESS FOR THE MANUFACTURE OF A MICROMACHINED DEVICE TO CONTAIN OR CONVEY A FLUID

Nicolaas Frans de Rooij, Bôle; Sylvain Jeanneret, La Chaux-de-Fonds; Volker Gass, and Bart van der Schoot, both of Neuchâtel, all of, Switzerland, assignors to Universite de Neuchatel, Neuchatel, Switzerland

Filed May 23, 1994, Ser. No. 247,550

Claims priority, application France, May 24, 1993, 93 06281

Int. Cl.^{6} F04B *43/00*

U.S. Cl. 430—320 **3 Claims**

1. A process for manufacturing a micromachined device which is adapted to contain or convey a fluid and which comprises a body, having at least one cavity surrounded by hydrophilic oxidized surfaces for containing or conveying the fluid, and closure plates fixed to said body, said process comprising the following steps:

covering surfaces of a silicon plate, which are designed to be in contact with said closure plates, with an intermediate oxide layer and a screening layer which is resistant to machining operations;

machining the silicon plate by means of selective oxidation and photolithographic operations to form therein said cavity;

then, oxidizing said surfaces surrounding said cavity to form on said surfaces a second oxide layer which is thicker than said intermediate oxide layer;

removing said screening layer;

eliminating said intermediate oxide layer and partly removing said second oxide layer so as to leave only a final oxide layer which covers said surfaces and favors the wettability thereof; and

fixing said closure plates to the body thus obtained.

5,462,840
USE OF POLY(35-DISUBSTITUTED 4-HYDROXYSTYRENE/N-SUBSTITUTED MALEIMIDE FOR FORMING A NEGATIVE IMAGE

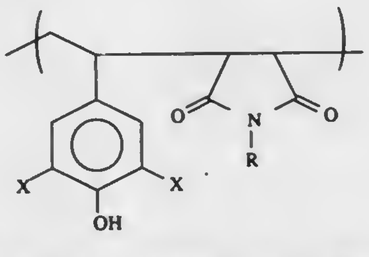
Richard Vicaari, Corpus Christi, Tex., assignor to Hoechst Celanese Corporation, Somerville, N.J.

Continuation of Ser. No. 506,508, Apr. 9, 1990, abandoned, which is a continuation of Ser. No. 97,810, Sep. 16, 1987, abandoned. This application Mar. 19, 1991, Ser. No. 673,243

Int. Cl.^{6} G03F *7/30;7/40*

U.S. Cl. 430—326 **4 Claims**

1. A process for forming a negative photographic image which comprises coating a photographic composition on a support, which photosensitive composition comprises in admixture an alternating copolymer having the structure



wherein X is independently H, C_1 to C_{10} alkyl or alkoxy, primary or secondary amino or halogen, and R consists of a group which is aliphatic, cycloaliphatic, or aliphatic heterocyclic, and wherein the molecular weight ranges from about 1,000 to 50,000; and an o-quinone diazide photosensitizer, a crosslinking agent and a solvent; wherein said copolymer is present in sufficient amount to serve as a binder for the composition, and said diazide and crosslinking agent are present in sufficient amount to provide image differentiation when the composition is coated on a substrate and imagewise exposed to actinic radiation; and said solvent is present in sufficient amount to form a homogeneous solution of the composition components; drying the composition until it is substantially non-tacky; imagewise exposing the composition to sufficient actinic, electron beam or x-ray radiation to provide an imagewise differentiation; crosslinking said copolymer; and removing the imagewise non-exposed portions of said composition with a developer.

5,462,841

TONE RENDITION OF HALFSTONE IMAGES BY PROJECTION EXPOSURE

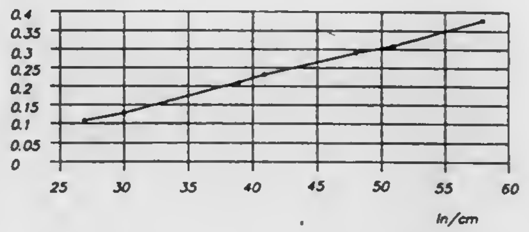
Lode Carleer, Duffel, Belgium, assignor to AGFA-Gevaert N.V., Mortsel, Belgium

Filed Apr. 15, 1994, Ser. No. 228,374

Claims priority, application European Pat. Off., May 19, 1993, 93201431

Int. Cl.^{6} G03C ***5/04***

U.S. Cl. 430—396 **6 Claims**



1. A method for producing by projection exposure of a screened halftone original a reproduction with improved tonality rendition comprising the steps of:

a. Photo-exposing a silver halide emulsion mask film material to said halftone original while the silver halide emulsion layer of the mask film is in close proximity to said halftone original so that a latent screen-free continuous mask image is formed in the mask film, the dose for said photo-exposure being determined by means of a linear relation between the screen ruling size of said halftone original and the maximum optical density that the mask image is required to have in an area corresponding to an area of the original having a dot value in the range of 0–10% dot,

b. Photographically developing said latent mask image in the thus exposed mask film to produce a correction mask, the developing conditions being such that an image of opposite image values with respect to said halftone original is obtained and such that when said close proximity exposure is carried out through a sensitometric wedge continuous tone wedge, a wedge reproduction is obtained wherein the sensitometric curve (Density vs. log E) has a Density/Gradient relationship as in the following Table A:

Density	Gradient
0.05	0.18
0.10	0.43
0.15	0.57
0.20	0.69
0.25	0.81
0.30	0.94

with the proviso that said density values may deviate from those specified in Table A by a factor from 0.5–2;

c. Projection-exposing a photo-sensitive printing plate or a silver halide emulsion film material through an assembly in imagewise registration of said halftone original and said correction mask; and

d. Photographically developing the projection-exposed material under high-contrast development conditions to form reproduction with improved tonality rendition.

5,462,842

PHOTOGRAPHIC ELEMENT HAVING A BLUE LIGHT SENSITIVE LAYER CONTAINING A PARTICULAR YELLOW DYE-FORMING COUPLER AND A MAGENTA IMAGE DYE-FORMING COUPLER

Charles E. Romano, Jr.; Larry D. Edwards, and Richard E. Hibbs, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

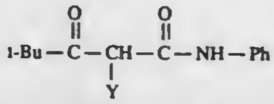
Filed Jan. 12, 1994, Ser. No. 180,252

Int. Cl.^{6} G03C ***1/46***

U.S. Cl. 430—503 **20 Claims**

1. A multicolor photographic element comprising at least one light sensitive photographic silver halide emulsion layer sensitive to blue light and containing a yellow image dye-forming coupler, at least one light sensitive photographic silver halide emulsion layer sensitive to green light and containing emulsion layer sensitive to green light and containing a magenta image dye-forming coupler, and at least one light sensitive photographic silver halide emulsion layer sensitive to red light and containing a cyan dye-forming coupler,

wherein said yellow image dye-forming coupler has the formula I:



$$\text{t-Bu}-\overset{\overset{\large O}{\|}}{C}-\underset{\underset{\large Y}{|}}{CH}-\overset{\overset{\large O}{\|}}{C}-NH-Ph$$

I

wherein t-Bu is a tertiary butyl group, Ph is an unsubstituted phenyl ring or one containing up to 5 substituents, and Y is a heterocyclic ring, substituted or not, which is capable of leaving upon reaction of the coupler with oxidized developer; and

wherein said at least one light sensitive photographic silver halide emulsion layer sensitive to blue light and containing said yellow image dye-forming coupler, or another light sensitive photographic silver halide emulsion layer sensitive to blue light and containing a yellow image dye-forming coupler, has associated therewith a magenta image dye-forming coupler,

and provided that where substitution by a substituent is indicated, the substituent may, unless otherwise specified, be selected from the group consisting of halogen; nitro; hydroxyl; cyano; and carboxyl acid groups; and from alkyl; alkenyl: alkoxy; aryl; aryloxy; carbonamido; sulfonamido; sulfamoyl; carbamoyl; acyl; sulfonyl; sulfonyloxy; sulfinyl; thio; acyloxy; amino; imino; phosphate; phosphite; heterocyclic, heterocyclicoxy, and heterocyclicthio, each of which contains a 3 to 7 membered heterocyclic ring composed of carbon atoms and at least one hetero atom selected from the the group consisting of oxygen, nitrogen, and sulfur; quaternary ammonium: and silyloxy; where said substituents may themselves be further substituted with any of the above groups.

5,462,843

RECORDING MATERIAL FOR COLOR PHOTOGRAPHY

Sieghart Klötzer, Köln, and Bruno Mücke, Bergisch Gladbach, both of, Germany, assignors to Agfa-Gevaert AG, Leverkusen, Germany

Continuation-in-part of Ser. No. 36,156, Mar. 24, 1993, abandoned. This application Sep. 20, 1994, Ser. No. 309,553

Claims priority, application Germany, Apr. 6, 1992, 42 11 462.4

Int. Cl.^{6} G03C ***1/46***

U.S. Cl. 430—503 **5 Claims**

1. A silver halide material for colour photography, comprising a support, at least one blue-sensitive yellow-coupling silver halide emulsion layer, at least one green-sensitive, magenta-coupling silver halide emulsion layer, and at least one red-sensitive, cyan-coupling silver halide emulsion layer applied to the support and conventional intermediate and protective layers, the silver halide emulsion in at least one of the silver halide layers comprising 95 to

100 mol-% AgCl and 0 to 5 mol-% AgBr, is ripened with compounds of gold and sulphur, wherein said silver halide emulsion is doped with at least one compound of a metal of group (a) and with at least one compound of gold, where (a) comprises rhodium, iridium, osmium, ruthenium, rhenium and cadmium.

5,462,844
LIGHT-SENSITIVE SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL AND PROCESS FOR PREPARING COLOR PROOF

Yasuo Tosaka, Odawara, Japan, assignor to Konica Corporation, Tokyo, Japan

Continuation of Ser. No. 120,728, Sep. 13, 1993, abandoned. This application Mar. 29, 1995, Ser. No. 412,618

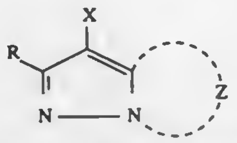
Claims priority, application Japan, Sep. 16, 1992, 4-246869

Int. Cl.^{6} G03C *1/46*

U.S. Cl. 430—503 **14 Claims**

1. A light-sensitive silver halide color photographic material comprising a support and provided thereon a yellow image forming silver halide emulsion layer, a magenta image forming silver halide emulsion layer and a cyan image forming silver halide emulsion layer, wherein said yellow image forming layer contains a Y-emulsion defined as silver halide emulsion which forms a yellow image, said magenta image forming layer contains an M-emulsion defined as a silver halide emulsion which forms a magenta image and said cyan image forming layer contains a C-emulsion which is defined as a silver halide emulsion which forms a cyan image, said Y-, M-, and C-emulsion having spectral sensitivity wavelength regions respectively different from one another; and a P-emulsion defined as a silver halide emulsion with a spectral sensitivity having a part common to the respective spectral sensitivity regions of said C-, M- and Y-emulsions contained in at least one of said image forming silver halide emulsion layers; said magenta image forming silver halide emulsion layer containing a compound represented by the following Formula M-1 and a yellow dye forming coupler

Formula M-1



where Z represents a group of non-metal atoms necessary to complete a nitrogen-containing heterocyclic ring, X represents a hydrogen atom or a group capable of being split off upon reaction with an oxidized product of a color developing agent and R represents a hydrogen atom or a substituent,

and wherein a ratio of the sensitivity of said C-, M- or Y-emulsion to that of said P-emulsion is within a range of 1/10 to 10.

5,462,845
SILVER HALIDE COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Yasuhiro Yoshioka, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 159,459, Nov. 30, 1993, abandoned. This application Jul. 14, 1994, Ser. No. 275,333

Claims priority, application Japan, Nov. 30, 1992, 4-341012

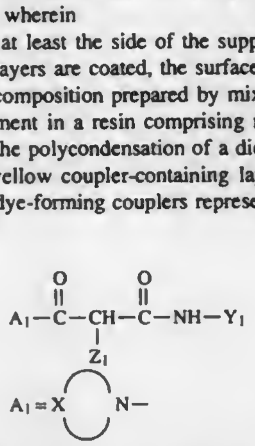
Int. Cl.^{6} G03C *1/46*

U.S. Cl. 430—505 **17 Claims**

1. A silver halide color photographic light-sensitive material comprising a reflective support having provided thereon (a) at least three light-sensitive hydrophilic colloid layers on one side of the reflective support, with at least one light-sensitive layer containing a yellow color-developing coupler and silver halide emulsion grains, at least one light-sensitive layer containing a magenta color-developing coupler and silver halide emulsion grains, and at least one light-sensitive layer containing a cyan color-developing coupler and silver halide emulsion grains, with each light-sensitive layer having a different color sensitivity from the other light-sensitive layers, and (b) a light-insensitive hydrophilic colloid layer, wherein

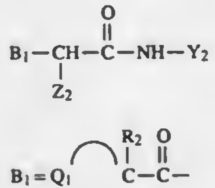
on at least the side of the support on which the light-sensitive layers are coated, the surface of the support is coated with a composition prepared by mixing and dispersing a white pigment in a resin comprising mainly polyester synthesized by the polycondensation of a dicarboxylic acid and a diol, and

a yellow coupler-containing layer contains at least one of the dye-forming couplers represented by formula (I) or (II):



(I)

wherein X represents an organic group necessary to form a nitrogen-containing heterocyclic group together with a nitrogen atom; Y_1 represents an aromatic group or a heterocyclic group; and Z_1 represents a group that splits off when the coupler represented by formula (I) reacts with an oxidation product of a developing agent;



(II)

wherein R_2 represents a monovalent substituent other than a hydrogen atom, wherein said monovalent substituent is selected from the group consisting of a halogen atom, an alkyl group, an alkoxy group, an alkylthio group, an aryl group, an aryloxy group, and an arylthio group; Q_1 represents a group of non-metal atoms necessary to form a 3- to 5-membered hydrocarbon ring or a 3- to 6-membered heterocyclic group having at least one hetero atom selected from the group consisting of N, O, S and P together with at least one carbon atom; provided that R_2 may be combined with Q_1 to form a polycyclic ring having two or more rings; Z_2 represents a hydrogen atom or a group capable of splitting off upon a coupling reaction with the oxidation product of an aromatic primary amine developing agent; and Y_2 represents an aromatic group or a heterocyclic group.

5,462,846
SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL

Hiroyuki Yoneyama, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 22, 1994, Ser. No. 346,193

Claims priority, application Japan, Nov. 22, 1993, 5-313974

Int. Cl.^{6} G03C *1/46*

U.S. Cl. 430—507 **12 Claims**

1. A silver halide color photographic material having, on a support, a yellow-coloring silver halide emulsion layer, a magenta-coloring silver halide emulsion layer, a cyan-coloring silver halide emulsion layer and at least one non-coloring layer, wherein said non-coloring layer contains at least one water-insoluble polymer having a number average molecular weight of less than 2000 which is obtained by polymerizing at least one monomer having an aromatic group.

5,462,847

SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL

Shigeaki Otani, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

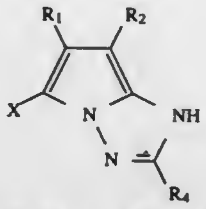
Filed Jun. 2, 1993, Ser. No. 70,294

Claims priority, application Japan, Jun. 2, 1992, 4-165481

Int. Cl.^{6} G03C *1/08*

U.S. Cl. 430—508 **26 Claims**

1. A silver halide color photographic material comprising at least one yellow-developable silver halide emulsion layer, at least one magenta-developable silver halide emulsion layer and at least one cyan-developable silver halide emulsion layer on a support, wherein said at least one cyan-developable silver halide emulsion layer comprises at least one cyan dye-forming coupler represented by the following formula (IIIa) and silver bromocholoride or silver chloride emulsion grains substantially free of silver iodide having a silver chloride content of 95 mol % or more spectrally sensitized with at least one sensitizing dye having a reduction potential of −1.27 V or lower:



(IIIa)

R_1 is a cyano group and R_2 is any of a trifluoromethyl group, a straight-chain or branched unsubstituted alkoxycarbonyl group, an alkoxycarbonyl group substituted with a carbamoyl group, an alkoxycarbonyl group having an ether bond, and an aryloxycarbonyl group that is either unsubstituted or substituted with an alkyl group or an alkoxy group; R_4 represents a hydrogen atom or substituent; X represents a hydrogen atom or a split-off group from the rest of the structure upon coupling reaction with an oxidation product of an aromatic primary amine color developing agent; and R_1, R_2, R_4 or X may be a divalent group which is connected to a dimer or higher polymer or a high molecular chain to form a homopolymer or copolymer.

5,462,848

COLOR PHOTOGRAPHIC MATERIALS INCLUDING MAGENTA COUPLER, INHIBITOR-RELEASING COUPLER AND CARBONAMIDE COMPOUND, AND METHODS

Paul B. Merkel, Rochester, and Stephen P. Singer, Spencerport, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 752,147, Aug. 29, 1991, Pat. No. 5,250,405. This application Jun. 10, 1993, Ser. No. 74,908

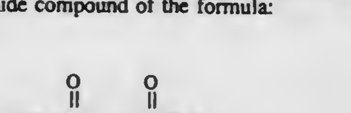
Int. Cl.^{6} G03C *1/08;7/26;7/32*

U.S. Cl. 430—546 **18 Claims**

1. A color photographic material, comprising a sup-port bearing a silver halide emulsion and a coupler composition comprising

(a) a two-equivalent pyrazolone magenta dye-forming coupler;

(b) a carbonamide compound of the formula:



$$R_7R_8N\overset{\overset{O}{\|}}{C}-A-\overset{\overset{O}{\|}}{C}NR_8R_7 \qquad (V)$$

wherein, R_7 and R_8 are individually selected from the group consisting of (i) straight chain, branched and cyclic alkyl groups, straight chain and branched alkenyl groups and straight chain and branched alkylene groups, (ii) said alkyl groups, alkenyl groups and alkylene groups containing one or more substituents selected from the group consisting of alkoxy, aryloxy, aryl, alkoxycarbonyl, aryloxycarbonyl, and acyloxy groups and halogens; (iii) a phenyl group; and (iv) a phenyl group containing one or more substituents selected from the group consisting of alkyl, alkoxy, aryloxy, alkoxycarbonyl, aryloxycarbonyl and acyloxy groups and halogens; and further wherein R_7 and R_8 combined contain at least 12 carbon atoms; and A is a phenylene group.

5,462,849

SILVER HALIDE EMULSIONS WITH DOPED EPITAXY

Traci Y. Kuromoto, West Henrietta; Eric L. Bell, Wesbter; Woodrow G. McDugle, Rochester; Raymond S. Eachus, Rochester; Sherrill A. Puckett, Rochester; Myra T. Olm, Webster, and Robert D. Wilson, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 27, 1994, Ser. No. 330,280

The portion of the term of this patent subsequent to Nov. 1, 2011, has been disclaimed.

Int. Cl.^{6} G03C *1/08;1/09;1/035*

U.S. Cl. 430—567 **20 Claims**

1. A photographic silver halide emulsion comprised of radiation sensitive composite silver halide grains including host grain portions accounting for at least 50 percent of total silver and surface portions epitaxially deposited on the host grain portions wherein

the epitaxially deposited surface portions on the host grain portions exhibit a face centered cubic crystal lattice structure containing a hexacoordination complex of a metal from periods 4, 5 and 6 of groups 3 to 14 inclusive of the periodic table of elements in which one or more organic ligands each containing at least one carbon-to-carbon bond, at least one carbon-to-hydrogen bond or at least one carbon-to-nitrogen-to-hydrogen bond sequence occupy up to half the metal coordination sites in the coordination complex and at least half of the metal coordination sites in the coordination complex are provided by halogen or pseudohalogen ligands.

5,462,850

SILVER HALIDE PHOTOGRAPHIC MATERIAL

Masahiro Asami; Naoto Ohshima, and Shigeaki Otani, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 84,449, Jul. 1, 1993, abandoned, which is a continuation of Ser. No. 821,907, Jan. 15, 1992, abandoned, which is a continuation of Ser. No. 393,553, Aug. 14, 1989, abandoned, which is a continuation-in-part of Ser. No. 181,401, Apr. 14, 1988, abandoned. This application Feb. 6, 1995, Ser. No. 383,980

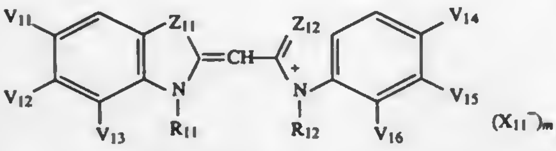
Claims priority, application Japan, Apr. 17, 1987, 62-94931; Apr. 20, 1987, 62-97090

Int. Cl.^{6} G03C *1/28*

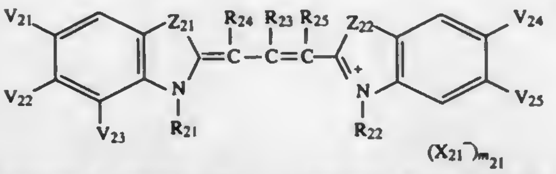
U.S. Cl. 430—569 **18 Claims**

1. A silver halide color photographic paper having on a reflective base at least one blue light sensitive photosensitive emulsion layer, at least one green light sensitive photosensitive emulsion layer, and at least one red light sensitive photosensitive emulsion layer containing a silver halide emulsion having a silver chloride content of 95 mol % or more, said blue light or green light sensitive photosensitive emulsion layers containing a silver halide photographic emulsion, which comprises:

a silver halide photographic emulsion containing silver chlorobromide including a silver chloride in an amount of 95 mol % or more but substantially free from silver iodide and prepared by the steps comprising forming silver halide grains in the presence of a hydrophilic colloid, physical ripening, desalting, and chemical ripening, and adding (i) a photographic blue spectral-sensitizing dye of formula (VII) to said blue light sensitive photosensitive emulsion layer, (ii) adding a photographic green spectral sensitizing dye of formula (VIII) to said green light sensitive photosensitive emulsion layer, or (iii) adding said blue spectral-sensitizing dye of formula (VII) to said blue light sensitive photosensitive emulsion layer and adding a photographic green spectral-sensitizing dye of formula (VIII) to said green light sensitive photosensitive emulsion layer, said blue and green spectral-sensitizing dyes each being added in an amount in the range of 1.0×10^{-6} to 1.0×10^{-2} mol per mol of silver halide after the addition of at least 85 wt. % of a soluble silver salt solution, required for formation of the silver halide grains, but during the time silver halide grains are being formed;



(VII)

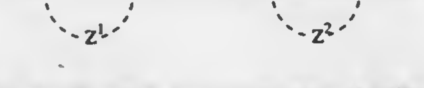


(VIII)

wherein in formula (VII), Z_{11} represents an oxygen atom or a sulfur atom; Z_{12} represents a sulfur atom or an oxygen atom; R_{11} and R_{12}, which may be the same or different, each represents an optionally substituted alkyl group or alkenyl group containing up to 6 carbon atoms, with at least one of R_{11} and R_{12} being a sulfo-substituted alkyl group; when Z_{11} represents an oxygen atom, V_{11} and V_{13} each represents a hydrogen atom, and V_{12} represents a phenyl group or a phenyl group substituted by an alkyl group or an alkoxy group containing up to 3 carbon atoms or a chlorine atom; when Z_{11} represents a sulfur atom, V_{11} represents an alkyl group or an alkoxy group containing up to 4 carbon atoms or a hydrogen atom, V_{12} represents an alkyl group containing up to 5 carbon atoms, an alkoxy group containing up to 4 carbon atoms, a chlorine atom, a hydrogen atom, an optionally substituted a hydroxy group, and V_{13} represents a hydrogen atom; X_{11} represents a counter ion which is required to neutralize a charge on a cyanine dye of formulas (VII) or (VIII); m_{11} represents 0 or 1, and in the case of forming an inner salt, m_{11} represents 1; V_{14} represents hydrogen or methyl, V_{15} represents hydrogen, chlorine or methyl, and V_{16} represents hydrogen; and

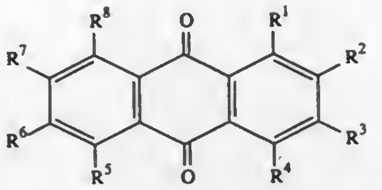
wherein in formula (VIII), Z_{21} represents an oxygen atom, and Z_{22} represents an oxygen atom; R_{21} and R_{22} are the same as defined for R_{11} or R_{12} in general formula (VII); R_{23} represents an ethyl group, a propyl group or a butyl group; R_{24} and R_{25} each represents a hydrogen atom; V_{21} represents a hydrogen atom;

V_{22} represents a hydrogen atom, an alkyl group containing up to 5 carbon atoms, an alkoxy group containing up to 5 carbon atoms, a chlorine atom or an optionally substituted phenyl group; V_{23} represents hydrogen or V_{22} may be bonded to V_{21} or V_{23} to form a fused benzene ring when Z_{21} represents an oxygen atom, or V_{22} represents an optionally substituted phenyl group or may be linked to V_{21} or V_{23} to form a fused benzene ring when Z_{21} and Z_{22} both represent an oxygen atom; V_{24} represents a hydrogen atom; V_{25} represents an alkoxy group containing up to 4 carbon atoms, a chlorine atom or an optionally substituted phenyl group or may be bonded to V_{24} or V_{26} to form a fused benzene ring; V_{26} represents a hydrogen atom; X_{21} represents a counter ion which is required to neutralize a charge on a cyanine dye of formula (VII) or (VIII); m_{21} represents 0 or 1 and, when an inner salt is formed, m_{21} represents 0; and said silver halide photographic emulsion further containing at least one compound represented by the formula (I), (II), or (III):

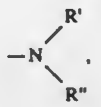


$$O{=}C{-}C{=}L{+}L{=}L{)_n}C{=}C{-}OH \quad (Z^1,\ Z^2)$$

wherein Z^1 and Z^2, which may be the same or different, each represent a group of nonmetal atoms required to form a heterocyclic ring, L represents a methine group in which L and L may connect each other to form a ring, and n is 0, 1, or 2,

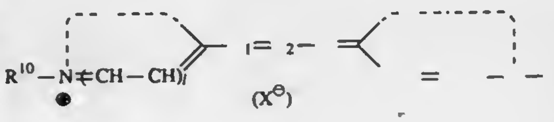


wherein R^1, R^4, R^5 and R^8, which may be the same or different, each represent a hydrogen atom, a hydroxy group, an alkoxy group, an aryloxy group, a carbamoyl group, or an amino group represented by

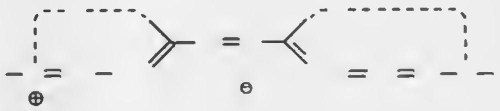


in which R' and R", which may be the same or different, each represent a hydrogen atom, or an aryl or an alkyl group, having at least one sulfonic acid group or a carboxylic acid group,

R^2, R^3, R^6, and R^7, which may be the same or different, each represent a hydrogen atom, a sulfonic acid group, a carboxyl group or an aryl or an alkyl group, having at least one sulfonic group or a carboxyl group,



(A)



(B)

wherein

R^{10} and R^{11}, which may be the same or different, each represent an alkyl group,

L_1, L_2, and L_3, which may be the same or different, each represent a methine group, m is 0, 1, 2, or 3,

L_1 and R^{10}, L_3 and R^{11}, L_2 and L_2 when m is 2, and L_1 and L_1 when m is 3, may connect each other to form a ring,

Z and Z', which may be the same or different, each represent a group of nonmetal atoms required for forming a heterocyclic 5- or 6-membered ring, and l and n each are 0 or 1,

$X^{\ominus}$ represents an anion, and p is 1 or 2, provided that when the compound forms an inner salt, p is 1.

5,462,851

SILVER HALIDE PHOTOGRAPHIC MATERIAL

Takashi Kato, and Tadashi Ikeda, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 16, 1993, Ser. No. 121,740

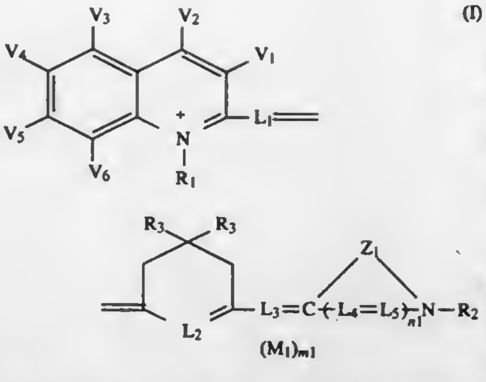
Claims priority, application Japan, Sep. 24, 1992, 4-254565

Int. Cl.⁶ G03C *1/20*

U.S. Cl. 430—584 **10 Claims**

1. A silver halide photographic material comprising a support having thereon at least one silver halide emulsion layer, wherein the layer contains at least one compound represented by formula (I):

(I)



wherein Z_1 represents an atomic group required for forming a five-membered or six-membered nitrogen-containing heterocyclic ring;

- R_1 and R_2 each represents an alkyl group;
- two R_3groups represent an alkyl group, an aryl group, or a heterocyclic group;
- V_1, V_2, V_3, V_4, V_5 and V_6 each represents a hydrogen atom or a substituent;
- L_1, L_2, L_3, L_4 and L_5 each represents a methine group;
- n_1 represents 0 or 1;
- M_1 represents an ion for neutralizing charge; and
- m_1 represents a number of 0 or more which is required for neutralizing charge in the compound.

5,462,852

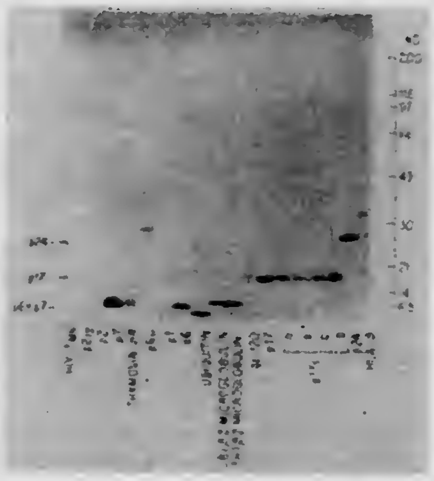
HIV NUCLEOCAPSID PROTEIN CAPTURE ASSAY AND METHOD OF USE

Larry O. Arthur, Walkersville, and Louis E. Henderson, Mt. Airy, both od, Md., assignors to The Government of the United States of America, as Represented by the Secretary, DHHS, Rockville, Md.

Filed Oct. 28, 1992, Ser. No. 967,658

Int. Cl.^{6} C12Q *1/70*

U.S. Cl. 435—5 **12 Claims**



1. An antigen capture method for detecting the presence of HIV-1 in a biological sample, without interference from antigen-antibody immune complexes, comprising the steps of:

a) contacting a lysate of the biological sample with a detectable amount of an antibody specifically reactive with the p7 antigen or an immunoreactive fragment of the p7 antigen for a time and under conditions sufficient for p7 antigen contained in the lysate to form a p7-antibody complex; and

b) determining the presence of the p7-antibody complex, the presence of the complex indicating the presence of HIV in the biological sample.

5,462,853

DETECTION OF COMPONENTS OF RNA VIRAL GLYCOPROTEINS USING A MANNOSE-SPECIFIC LECTIN BINDING ASSAY

Derek Stewart, Dundee; John M. S. Forrest, Gorsefield, both of, Great Britain, and Werner Muller, Wiesbaden, Germany, assignors to Scottish Crop Research Institute, Scotland

PCT No. PCT/GB90/01638, § 371 Date Jun. 19, 1992, § 102(e) Date Jun. 19, 1992, PCT Pub. No. WO91/06311, PCT Pub. Date May 16, 1991

Continuation of Ser. No. 849,017, Jun. 19, 1992, abandoned. This PCT application Oct. 25, 1990, Ser. No. 143,500

Claims priority, application United Kingdom, Jan. 25, 1989, 8924006; Germany, Dec. 2, 1989, 39 40 009.3; United Kingdom, Mar. 28, 1990, 9006965; May 9, 1990, 9011263

Int. Cl.^{6} C12Q *1/700*

U.S. Cl. 435—5 **8 Claims**

1. An in vitro assay for determining the presence or amount of components of RNA vital glycoproteins with mannose-mannose linkages selected from the group consisting of α-1→3 and α-1→6 mannose-mannose linkages in a sample suspected of containing said components, the assay comprising:

providing an Amaryllidaceae-derived lectin which specifically binds to mannose-mannose linkages selected from the group consisting of α-1→3 and α-1→6 mannose-mannose linkages;

contacting said samples with said lectin to form specific binding complexes between said lectin and any of said components in said sample;

determining the presence or amount of said specific binding complexes; and,

correlating the presence or amount of said specific binding complexes to the presence or amount of said components in said sample.

5,462,854

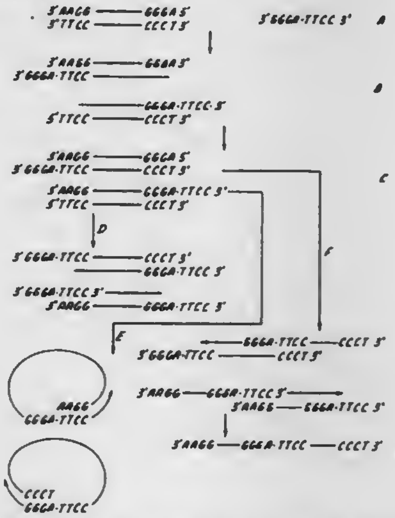
INVERSE LINKAGE OLIGONUCLEOTIDES FOR CHEMICAL AND ENZYMATIC PROCESSES

Peter J. Coassin, San Juan Capistrano; Kenneth D. Konrad, Long Beach; Jang B. Rampal, Yorba Linda, and Ronald M. Cook, San Rafael, all of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Apr. 19, 1993, Ser. No. 50,681

Int. Cl.^{6} C12Q *1/68;* C12P *19/34;* C07H *21/04*

U.S. Cl. 435—6 **12 Claims**



1. A process for the amplification of a double-stranded nucleic acid molecule, said molecule comprising a strand and a complementary strand, comprising the steps of:

(a) separating the strand from the complementary strand;

(b) treating the strand and the complementary strand to at least one 3'-Inverse Linkage Oligonucleotide, where each 3'-Inverse Linkage Oligonucleotide comprises a first sequence portion complementary to a region on said strand and a second sequence portion complementary to a region on said complementary strand, where said regions are not complementary with each other, under conditions sufficient to permit the first sequence portion of said 3'-Inverse Linkage Oligonucleotide to hybridize to said region on said strand or the second sequence portion of said 3'-Inverse Linkage Oligonucleotide to hybridize to said region on said complementary strand;

(c) extending said hybridized 3'-Inverse Linkage Oligonucleotide with a polymerase along said strand or said complementary strand, respectively, to form 3'-Inverse Linkage Oligonucleotide products, wherein each of said products includes a segment capable of hybridizing to the portion of the 3'-Inverse Linkage Oligonucleotide not hybridized in step (b);

(d) separating 3'-Inverse Linkage Oligonucleotide products from the strand and the complementary strands to form single-stranded products, wherein at least one 3'-Inverse Linkage Oligonucleotide product has a first 3'-termini complementary to a second 3'-termini, said first 3'-termini capable of hybridizing to said second 3'-termini to form a partially double-stranded circle;

(e) treating the single-stranded products of step (d) with the 3'-Inverse Linkage Oligonucleotide of step (b) and allowing said first and second 3'-termini to hybridize to form said partially double-stranded circle; and

(f) extending the 3'-Inverse Linkage Oligonucleotide and the appropriate 3'-termini of said circle with a polymerase.

5,462,855

METHOD FOR THE DETECTION AND QUANTITATIVE DETERMINATION OF NITROSOMONAS STRAINS IN WASTEWATERS OR SOILS

Wolfgang Springer, Wuppertal; Hans G. Rast, Bergisch Gladbach; Antonius Löbberding, Wuppertal, and Reinhard Kanne, Leverkusen, all of, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation of Ser. No. 692,745, Apr. 24, 1991, abandoned. This application Apr. 30, 1993, Ser. No. 55,945

Claims priority, application Germany, May 9, 1990, 40 14 845.9

Int. Cl.^{6} C12Q *1/68;* **C07H** *17/00*

U.S. Cl. 435—6 **7 Claims**

1. A DNA probe consisting of a labeled continuous fragment of SEQ ID No. 1, said fragment being selected from the group consisting of:

(i) a 0.2 kb PstI/AccI digestion fragment of SEQ ID No. 1;
(ii) a 0.3 kb PstI/HindIII digestion fragment of SEQ ID No. 1;
(iii) a 0.5 kb ClaI/PstI digestion fragment of SEQ ID No. 1;
(iv) a 0.7 kb PstI/AccI digestion fragment of SEQ ID No. 1; and
(v) a continuous fragment of SEQ ID No. 1 which is a 15 mer to 100 mer and which specifically hybridizes to Nitrosomonas strains from wastewaters or soil samples, but not to the genome of other bacteria.

5,462,856

METHODS FOR IDENTIFYING CHEMICALS THAT ACT AS AGONISTS OR ANTAGONISTS FOR RECEPTORS AND OTHER PROTEINS INVOLVED IN SIGNAL TRANSDUCTION VIA PATHWAYS THAT UTILIZE G-PROTEINS

Michael R. Lerner, Hamden, Conn., and Ethan A. Lerner, Brookline, Mass., assignors to Bunsen Rush laboratories, Inc., Newton, Mass.

Continuation-in-part of Ser. No. 555,724, Jul. 19, 1990. This application Jul. 16, 1991, Ser. No. 732,476

Int. Cl.^{6} C12N *15/12;5/10;* **G01N** *33/566*

U.S. Cl. 435—7.21 **14 Claims**

1. A method for identifying a chemical that acts as an agonist for a G-protein coupled cell surface receptor (GPC receptor) comprising: introducing to test cells of a pigment cell line capable of dispersing or aggregating their pigment in response to a specific stimulus and expressing an exogenous clone coding for the GPC receptor, a stimulant that sets an initial state of pigment disposition wherein the pigment is aggregated within the test cells if activation of the exogenous GPC receptor induces pigment dispersion, or introducing a stimulant that sets an initial state of pigment disposition wherein the pigment is dispersed within the test cells if activation of the exogenous GPC receptor induces pigment aggregation; contacting the test cells set in an initial state of pigment disposition with the test chemical; and determining whether the pigment disposition in the test cells treated with the chemical is changed from the initial state of pigment disposition, wherein a change in pigment disposition observed in the test cells expressing the exogenous GPC receptor indicates that the chemical is an agonist for the exogenous GPC receptor.

5,462,857

DIAGNOSING MALIGNANT HYPERTHERMIA SUSCEPTIBILITY BY DETECTION OF ABNORMAL PROTEOLYTIC ENZYME DIGESTION FRAGMENTS OF THE RYANODINE RECEPTOR

Kevin P. Campbell, Iowa City, Iowa; C. Michael Knudson, Kirkwood, Mo.; Steven D. Kahl, Iowa City, Iowa; Charles F. Louis, and James R. Mickelson, both of St. Paul, Minn., assignors to University of Iowa Research Foundation, Oakdale, Iowa

Continuation of Ser. No. 562,719, Aug. 6, 1990, Pat. No. 5,242,801. This application Aug. 9, 1993, Ser. No. 104,330

The portion of the term of this patent subsequent to Sep. 7, 2010, has been disclaimed.

Int. Cl.^{6} G01N *33/543;33/544;33/68*

U.S. Cl. 435—7.21 **8 Claims**

1. A method for identifying a pig which is heterozygous for malignant hyperthermia sensitivity, comprising:

a) providing a test sample isolated from muscle tissue isolated from a pig having a non-malignant hyperthermia phenotype;

b) contacting the test sample with trypsin under conditions which result in the production of a protein transfer blot banding pattern in control samples isolated from a pig which exhibits the malignant hyperthermia phenotype and a pig having a non-malignant hyperthermia phenotype, which banding pattern differs substantially in the relative intensity of a predetermined proteolytic fragment band when stained with anti-ryanodine receptor antibodies;

c) separating the proteolytic digestion fragments from step b) by gel electrophoresis;

d) transferring the separated proteolytic digestion fragments from step c) to a solid support thereby creating a protein transfer blot;

e) contacting the protein transfer blot from step d) with polyclonal antibodies which bind to the ryanodine receptor;

f) washing the protein transfer blot of step e) to remove non-specifically bound antibody;

g) detecting the specific binding of the polyclonal antibodies to the proteolytic digestion fragments bound to the solid support; and

h) comparing the relative intensity of the predetermined proteolytic fragment band, if present, in the test sample with the intensity of the predetermined proteolytic fragment band in the control sample from a normal pig treated as described above, a substantial difference in the relative intensity of the predetermined proteolytic fragment band in the test sample as compared with the predetermined proteolytic fragment band in the control sample, or the absence of said band, being diagnostic of heterozygosity for malignant hyperthermia sensitivity.

5,462,858

DRY MULTILAYER ANALYTICAL ELEMENTS FOR ASSAYING TRANSAMINASES

Marsha D. Bale Oenick, Rochester; Richard L. Detwiler, Webster; Jon N. Eikenberry, and John W. H. Sutherland, both of Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 29, 1993, Ser. No. 175,013

Int. Cl.^{6} C12Q *1/52;1/26;1/28;* **G01N** *21/25*

U.S. Cl. 435—16 **14 Claims**

1. A dry multilayer analytical element for assaying transaminases wherein said element comprises:

a) a transaminase substrate;

b) reagents that generate pyruvate in the presence of a transaminase and the transaminase substrate;

c) pyruvate oxidase and cofactors for pyruvate oxidase; and

d) reagents that generate a color in proportion to a concentration of hydrogen peroxide;

and wherein said element has, in the following order, a spreading layer, a reagent layer, and a support wherein

i) the spreading layer contains the transaminase substrate and a material selected from the group consisting of polymer beads, barium sulfate, titanium oxide, and mixtures thereof;

ii) the reagent layer contains the pyruvate oxidase; and

iii) both a hardened gelatin layer and a subbing layer separate the reagent layer from the spreading layer.

5,462,859

METHOD OF DIAGNOSING IRREGULARITIES IN BILE SALT ABSORPTION VIA BRUSH BORDER MEMBRANE PROTEINS

Helmut Hauser, Laboratorium fur Biochemie, ETH-Zentrum, Universitatstrasse 16, CH-8092 Zurich, Switzerland

Filed May 14, 1993, Ser. No. 61,372

Int. Cl.^{6} C12Q *1/02*

U.S. Cl. 435—29 **3 Claims**

1. A method for detecting irregularities in bile salt absorption via proteins of the intestinal brush border membrane comprising the steps of:

a) suspending an intestinal brush border membrane vessicle (BBMV) sample in a suitable buffer,

b) incubating said BBMV sample with suitable concentrations of radiolabelled bile salt at room temperature for suitable period of time,

c) centrifuging said BBMV sample incubated with radiolabelled bile salt at about 80000 g for about 10 min. to separate BBMV from bile salt associated with brush border membrane (BBM) protein,

d) measuring an amount of radiolabelled bile salt associated with the BBM protein, and

e) comparing the amount measured in step (d) with a standard bile salt-BBM protein association value wherein a discrepancy in said measured amount of step (d) and said standard bile salt-BBM protein association value represents an irregularity in bile salt absorption via proteins on intestinal brush border membrane.

5,462,860

CONDITIONED CULTURE MEDIUM FOR RAPID GROWTH AND DETECTION OF MICROBES

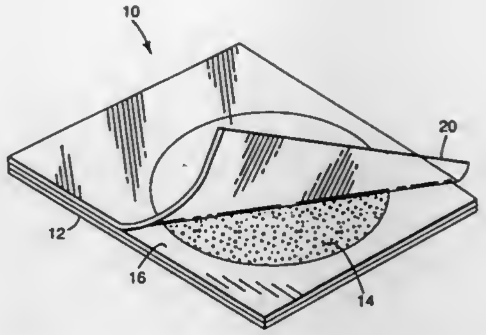
Patrick A. Mach, Shorewood, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jun. 6, 1994, Ser. No. 254,750

Int. Cl.^{6} C12M *3/04;* **C12N** *1/00;1/10;1/38*

U.S. Cl. 435—34 **9 Claims**

1. A conditioned culture medium which facilitates early detection and enumeration of microorganisms selected from the group consisting of Gram positive and Gram negative bacteria and fungi present in a sample, wherein the conditioned medium is prepared by a process comprising the steps of



i) inoculating a broth comprising gelatin, casein or animal peptones and yeast extract with a microbial culture wherein the microbial culture is selected from the group consisting of Gram positive and Gram negative bacteria and fungi

ii) incubating the broth while the microbial culture is in the log phase of growth,

iii) removing the incubated microbial culture from the broth, and

iv) adding carbohydrates and salts to the broth of step iii) to give a conditioned medium.

5,462,861

METHOD FOR IMPROVING ENZYME ACTIVITIES WITH NOBLE GASES

Kevin C. Spencer, Riverside; Pascal Schvester, and Christine E. Boisrobert, both of Chicago, all of Ill., assignors to American Air Liquide, Chicago Research Center, Countryside, Ill.

Continuation of Ser. No. 706,587, May 28, 1991, abandoned.

This application May 17, 1993, Ser. No. 62,332

The portion of the term of this patent subsequent to Nov. 15, 2011, has been disclaimed.

Int. Cl.^{6} C12N *9/14;9/86;9/88*

U.S. Cl. 435—41 **13 Claims**

1. A method for using an enzyme to act on a substrate therefor, wherein the enzyme activity is improved, which method comprises contacting at least one enzyme selected from the group consisting of hydrolases, lyases, isomerases and ligases, with the substrate therefor, and during at least part of said contacting, contacting said at least one enzyme with an amount effective to improve said enzyme activity of a gas consisting essentially of a noble gas selected from the group consisting of xenon, argon, neon, krypton and mixtures thereof, at a temperature effective to improve said enzyme activity, and at a pressure of up to about 3 atmospheres.

5,462,862

METHOD AND COMPOSITIONS FOR ENHANCING PRODUCTION OF SECONDARY METABOLITES USING CLUSTERED BIOSYNTHETIC GENES

Martinus A. M. Groenen, Zetten; Annemarie E. Veenstra, Vennep; Pieter Van Solingen, Naaldwijk; Bertus P. Koekman, Schipluiden; Lucia H. M. Van Der Voort, Pe Delft, all of, Netherlands; Juan F. Martin, Leon, Spain; Santiago Gutierrez, Leon, Spain; Bruno Diez, Sebastian, Spain; Emilio Alvarez, Sevilla, Spain; Jose L. Barredo, Trespaderne, Spain, and Christina Esmahan, Bilbao, Spain, assignors to Gist-brocades N.V., Ma Delft, Netherlands

Continuation of Ser. No. 392,119, Aug. 10, 1989, abandoned.

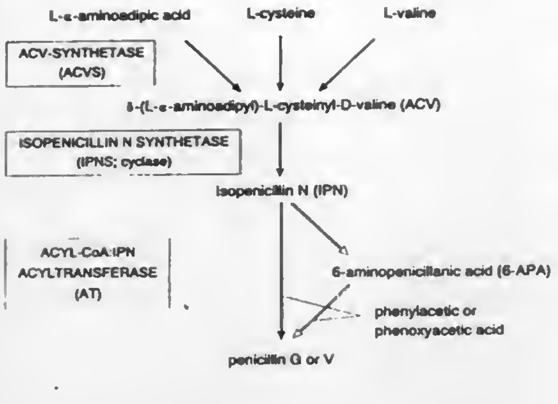
This application Jan. 25, 1993, Ser. No. 8,688

Claims priority, application European Pat. Off., Aug. 11, 1988, 88201714; Apr. 21, 1989, 89201044

Int. Cl.^{6} C12P *21/06;* **C12N** *15/00;1/20;* **C07H** *17/00*

U.S. Cl. 435—69.1 **17 Claims**

1. A DNA construct comprising at least two genes selected from the group consisting of genes encoding isopenicillin N synthetase, acyltransferase and ACV synthetase.



L-ε-aminoadipic acid
L-cysteine
L-valine
ACV-SYNTHETASE (ACVS)
δ-(L-ε-aminoadipyl)-L-cysteinyl-D-valine (ACV)
ISOPENICILLIN N SYNTHETASE (IPNS; cyclase)
Isopenicillin N (IPN)
ACYL-CoA:IPN ACYLTRANSFERASE (AT)
6-aminopenicillanic acid (6-APA)
phenylacetic or phenoxyacetic acid
penicillin G or V

5,462,863

ISOLATION OF HEPATITIS B SURFACE ANTIGEN FROM TRANSFORMED YEAST CELLS

Jih-Han Hsieh, Parsippany, N.J.; Shu-Ching Shih, York Avenue, N.Y.; Wei-Kuang Chi, Taipei, Taiwan, Prov. of China; Yi-Ding Chu, Taipei, Taiwan, Prov. of China, and Ae-Ning Lin, Taipei, Taiwan, Prov. of China, assignors to Development Center for Biotechnology, Taipei, Taiwan, Prov. of China

Continuation-in-part of Ser. No. 799,379, Nov. 27, 1991, abandoned, which is a continuation-in-part of Ser. No. 308,441, Feb. 9, 1989, abandoned. This application Apr. 28, 1994, Ser. No. 235,029

Int. Cl.^{6} C07K *14/085;1/30;1/36;* **C12N** *15/51*

U.S. Cl. 435—69.3 26 Claims

1. A method for recovering hepatitis B surface antigen protein from transformed yeast cells comprising the steps of:

obtaining an aqueous homogenate of said yeast cells;

enriching said hepatitis B surface antigen protein in said homogenate with a protein-aggregating reagent to form a precipitate which contains hepatitis B surface antigen protein;

dissolving said precipitate in a buffer to form a suspension; and

post-homogenizing said suspension to obtain a 10% to 50% increase in yield of said hepatitis B surface antigen protein; wherein said 10% to 50% increase in yield is calculated based on a yield achieved without performing said post-homogenizing step.

5,462,864

MANUFACTURING METHOD OF HIGH PURITY MALTOSE AND ITS REDUCED PRODUCT

Masahiro Niimi, Ibaraki; Yukari Hariu, Shizuoka; Koichi Kataura, Shizuoka; Yoshibumi Ishii, Shizuoka, and Kazuaki Kato, Saitama, all of, Japan, assignors to Towa Chemical Industry Co., Ltd., Tokyo, Japan

Division of Ser. No. 425,714, Oct. 24, 1989, Pat. No. 5,141,859. This application May 18, 1992, Ser. No. 884,197

Claims priority, application Japan, Jan. 28, 1988, 63-270855

Int. Cl.^{6} C12P *19/12;19/24;19/20;* **C12N** *1/20*

U.S. Cl. 435—100 22 Claims

1. A method to manufacture high purity maltitol using the following four processes:

(a) process of liquefying starch to produce a liquefied substance,

(b) process of saccharifying the obtained liquefied substance by using at least two enzymes selected from the group consisting of β-amylase, pullulanase and isoamylase,

(c) process of further saccharifying the obtained liquefied substance, after the start of the (b) process, by using glucoamylase or maltogenic-α-amylase which is produced by inserting the portion of the gene of *Bacillus stearothermophilus* coding for maltogenic-α-amylase into *Bacillus subtilis*, and

(d) process for reducing saccharic liquid after completion of the (c) process utilizing a nickel or noble metal catalyst.

5,462,865

PROCESS FOR PRODUCING TOCOPHEROLS

Achim Stocker, Zurich, and Wolf D. Woggon, Benglen, both of, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 908,762, Jul. 1, 1992, Pat. No. 5,348,869, which is a continuation of Ser. No. 466,360, Mar. 21, 1990, abandoned. This application Mar. 22, 1994, Ser. No. 216,112

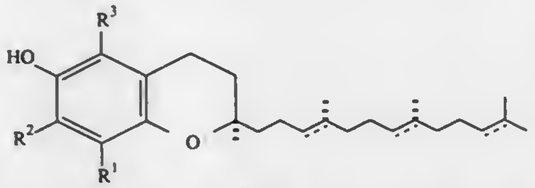
Claims priority, application European Pat. Off., Aug. 2, 1988, 88810529; Hague Agreement, Jul. 28, 1989, 89/00890

The portion of the term of this patent subsequent to Sep. 20, 2011, has been disclaimed.

Int. Cl.^{6} C12P *17/06;* **C12N** *1/12;1/20*

U.S. Cl. 435—125 10 Claims

1. A process for producing a compound of formula:

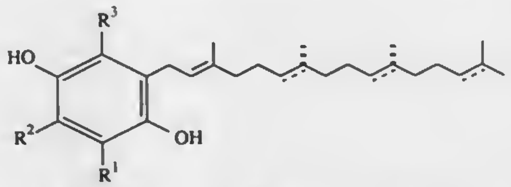


A

wherein R^1 is methyl and R^2 and R^3 are hydrogen; R^1 and R^2 are methyl and R^3 is hydrogen; R^1 and R^3 are methyl and R^2 is hydrogen; or R^1, R^2 and R^3 are all hydrogen or all methyl, and

------ indicates a single or a double bond, with the proviso that all ------ within the compound must be the same, which process comprises:

(a) reacting a compound of formula:



B

wherein R^1, R^2, R^3 and ------ are respectively the same as in the compound of formula A, with β-cyclodextrin or 2,6-di-O-methyl-β-cyclodextrin to form a complex;

(b) treating the complex, in an effective amount of a reducing agent, with enzyme fractions having cyclase activity obtained from solubilized spheroplasts of *Anabaena variabilis* SAG 1403-4*b* or Chlorogloeopsis SAG 1411-1; and

(c) recovering the compound of formula A.

5,462,866

SEMIPERMEABLE MICROSPHERES ENCAPSULATING BIOLOGICAL MATERIAL

Taylor G. Wang, Nashville, Tenn., assignor to Vanderbilt University, Nashville, Tenn.

Division of Ser. No. 812,647, Dec. 23, 1991, Pat. No. 5,260,002. This application Sep. 23, 1993, Ser. No. 126,787

Int. Cl.^{6} C12N *11/00;11/16;11/18*

U.S. Cl. 435—174 6 Claims

1. Semipermeable microspheres encapsulating biological material, comprising microspheres of substantially uniform diameter within the range from 200 microns to 2 millimeters, said microspheres having a central portion composed of a solution of a polyanion containing a biological material of molecular size greater than 150,000 Daltons, and an outer permeable membrane enclosing said central portion, said membrane being a complex of said polyanion and a polycation, the porosity of said membrane being such than said biological material does not permeate said membrane, said microspheres being formed by individually enveloping falling droplets of said polyanion solution with a collapsing

annular sheet of a solution of said polycation while said sheet is traveling downwardly at essentially the same velocity as said droplets.

5,462,867

COVALENT ATTACHMENT OF MACROMOLECULES TO POLYSULFONES OR POLYETHERSULFONES MODIFIED TO CONTAIN FUNCTIONALIZABLE CHAIN ENDS

A. R. M. Azad, Northborough, and Randal A. Goffe, Medway, both of Mass., assignors to Hemasure, Inc., Marlborough, Mass.

Continuation of Ser. No. 956,432, Oct. 1, 1992, abandoned, which is a continuation of Ser. No. 258,406, Oct. 17, 1988, abandoned. This application Feb. 2, 1994, Ser. No. 190,732

Int. Cl.^{6} C12N *11/06;* **G01N** *33/549;* **C07K** *17/06;* **C07C** *315/00*

U.S. Cl. 435—181 76 Claims

1. A process for modifying the surface properties of a hydrophobic polymer chosen from the group consisting of polysulfones and polyethersulfones comprising:

(a) treating said hydrophobic polymer with an alkali hydroxide, whereby hydroxyl groups are formed to increase the number of functionalizable chain ends;

(b) contacting said hydrophobic polymer with a solution comprising a first solvent, which is nonsolubilizing to said hydrophobic polymer, and a linker moiety capable of covalently bridging said hydrophobic polymer to a macromolecule, for a length of time sufficient to form a covalent bond between a hydroxyl functionalizable chain end of said hydrophobic polymer and said linker moiety; and

(c) contacting the reacted hydrophobic polymer of step (a) with a solution comprising a second solvent, which is nonsolubilizing to said hydrophobic polymer of step (a), and said macromolecule, for a length of time sufficient to covalently bind said macromolecule to said covalently bound linker moiety, to provide a product hydrophobic polymer with modified surface properties.

5,462,868

COCAINE ESTERASE FROM PSEUDOMONAS SP. NCIMB 40427 FOR DETECTION OF COCAINE

Adrian J. Britt, Culcheth; Neil C. Bruce, Cambridge, and Christopher R. Lowe, Saffron Walden, all of, England, assignors to British Technology Group Limited, London, England

PCT No. PCT/GB92/01324, § 371 Date Jan. 26, 1994, § 102(e) Date Jan. 26, 1994, PCT Pub. No. WO93/02186, PCT Pub. Date Feb. 4, 1993

PCT Filed Jul. 20, 1992, Ser. No. 185,835

Claims priority, application United Kingdom, Jul. 22, 1991, 9115765

Int. Cl.^{6} C12N *9/16;1/20;* **C12Q** *1/44*

U.S. Cl. 435—196 5 Claims

1. An isolated cocaine esterase obtainable from Pseudomonas sp NCIMB 40427 or a mutant thereof having the following properties:

(1) it catalyses the debenzoylation of cocaine;

(2) it has a molecular weight in the unaggregated form of about 120,000 Daltons as determined by gel filtration;

(3) it has esterase activity specifically at the benzoate ester linkage of cocaine,

(4) it separates at a major band of Rf about 0.2 on PAGE, in its aggregated form; and

(5) it is completely inhibited by 1 mM phenylmethylsulphonyl fluoride but ineffectively inhibited by 1 mM eserine, each determined at 30° C. with respect to 2 mM cocaine as substrate.

5,462,869

HUMAN ENDOTHELIN CONVERTING ENZYME ISOLATED FROM BLOOD OR PLACENTA BY HYDRATED DENSITY

Tatsuya Obwaki, Ohimachi, and Hiroshi Sakai, Ohi, both of, Japan, assignors to Nisshin Flour Milling Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 982,581, Nov. 27, 1992, abandoned. This application May 23, 1994, Ser. No. 247,413

Claims priority, application Japan, Nov. 29, 1991, 3-316874

Int. Cl.^{6} C12N *9/48;9/50;9/64*

U.S. Cl. 435—212 5 Claims

1. An isolated endothelin converting enzyme having an activity of converting big endothelin to endothelin, wherein said enzyme is isolated from human or porcine blood by the steps of:

(i) separating serum or plasma from said blood;

(ii) centrifuging said serum or plasma at 4° to 25° C. for 10–30 minutes at 10,000 to 30,000 g;

(iii) removing a fraction I which floats to the surface;

(iv) centrifuging the fraction I-free sample at 4°–25° C. for 16 to 24 hours at 100,000 to 200,000 g;

(v) removing a fraction II which floats to the surface;

(vi) adjusting the density of the remaining sample, which is free of fraction II to about 1.063 g/ml and the pH to about 7.0;

(vii) centrifuging the sample of (vi) at 4°–25° C. for 16–24 hours at 100,00 to 200,000 g; and

(viii) collecting a fraction III which floats to the surface and contains endothelin converting enzyme which has a hydrated density of about 1.006 to about 1.063 g/ml.

5,462,870

HUMAN DIPLOID SALIVARY GLAND EPITHELIAL CELL LINES

Dharam P. Chopra, Detroit, Mich., assignor to Wayne State University, Detroit, Mich.

Filed Apr. 23, 1993, Ser. No. 52,263

Int. Cl.^{6} C12N *5/08;5/06*

U.S. Cl. 435—240.2 2 Claims

1. A biologically pure culture of a normal diploid immortal epithelial cell line derived from a male human designated ATCC Registration No. CRL11706.

5,462,871

ISOLATED NUCLEIC ACID MOLECULES WHICH ENCODE MAGE DERIVED NONAPEPTIDES

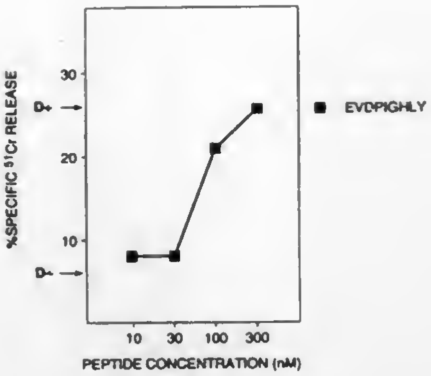
Thierry Boon-Falleur; Pierre van der Bruggen; Etienne De Plaen; Christophe Lurquin, all of Brussels, Belgium; Catia Traversari, Milan, Italy; Beatrice Gaugler, and Benoit Van den Eynde, both of Brussels, Belgium, assignors to Ludwig Institute for Cancer Research, New York, N.Y.

Continuation-in-part of Ser. No. 938,334, Aug. 31, 1992, Pat. No. 5,405,940, and a continuation-in-part of Ser. No. 37,230, Mar. 26, 1993. This application Jun. 7, 1993, Ser. No. 73,103

Int. Cl.^{6} C12N *15/12;1/21;5/10*

U.S. Cl. 435—240.2 16 Claims

1. Isolated nucleic acid molecule consisting of a nucleotide sequence which codes for a nonapeptide selected from the group consisting of SEQ ID NO: 17, SEQ ID NO: 18, SEQ ID NO: 19, SEQ ID NO: 20, SEQ ID NO: 21, and SEQ ID NO: 22, wherein said nonapeptide binds to a human leukocyte antigen molecule on a cell surface and provokes lysis of said cell by a cytolytic T lymphocyte specific for a complex of said nonapeptide and said human leukocyte antigen.



5,462,872

HUMAN LYMPHOID CELLS EXPRESSING HUMAN IMMUNODEFICIENCY VIRUS ENVELOPE PROTEIN GP160

Zdenka L. Jonak, Devon; Christine Debouck, Wayne, both of Pa.; Robert Clark, Woodstown, N.J., and Stephen Trulli, Havertown, Pa., assignors to SmithKline Beecham Corporation, Philadelphia, Pa.

Continuation of Ser. No. 906,613, Jun. 30, 1992, which is a continuation of Ser. No. 587,011, Sep. 24, 1990, abandoned. This application Oct. 8, 1993, Ser. No. 134,128

Int. Cl.^{6} C12N *5/22*

U.S. Cl. 435—240.2 **4 Claims**

1. A CD4 negative, Epstein-Barr virus negative, human Burkittle lumphoma modified to stably express a heterologous protein consisting of the entire human immunodeficiency virus envelop protein gp160 and which is capable of forming syncytia with human lymphoid cells of CD4+ phenotype.

5,462,873

DNA FOR USE IN A SIMPLE METHOD FOR DETECTING INHIBITORS OF RETROTRANSPOSITION

David J. Garfinkel, Frederick, and M. Joan Curcio, Keedysville, both of Md., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Continuation of Ser. No. 668,865, Mar. 13, 1991, abandoned. This application Aug. 6, 1993, Ser. No. 102,854

Int. Cl.^{6} C12N *15/00;* C07H *17/00*

U.S. Cl. 435—254.2 **17 Claims**

1. A vector comprising a DNA segment comprising a selectable marker gene wherein said selectable marker gene contains an intron inserted into a coding sequence of said gene and said intron is present in an antisense orientation relative to transcription of said marker gene.

5,462,874

DIALYZED MULTIPLE WELL TISSUE CULTURE PLATE

Martin L. Wolf, 1280 Keston St., St. Paul, Minn. 55108, and John R. Wilson, 173 Windsor La., New Brighton, Minn. 55112

Filed Jun. 23, 1993, Ser. No. 81,541

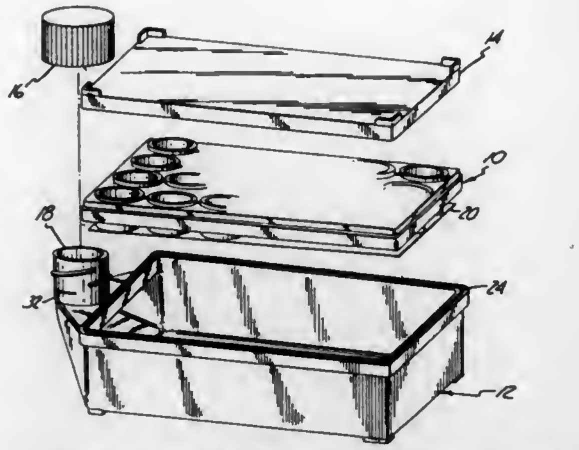
Int. Cl.^{6} C12M *3/00*

U.S. Cl. 435—297.5 **6 Claims**

1. A multiple well tissue culture assembly comprising

a) a plate comprising a plurality of wells each open at the top and bottom and defining a first predetermined volume,

b) a membrane closing off the bottom of each well, said membrane excluding passage therethrough of molecules in excess of a predetermined size between 10,000 and 50,000 daltons,



c) a common reservoir defining a second predetermined volume greater than the sum of the first predetermined volumes of a plurality of said wells, said common reservoir having an access port for adding basal medium to and removing basal medium from said reservoir, and

d) means for securing said plate to said reservoir so that when said reservoir contains a basal medium, said medium is in contact with the membrane which closes the bottoms of the wells.

5,462,875

CELL CULTURE VIAL

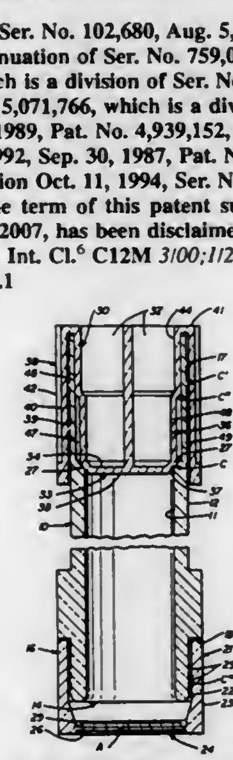
Stephen M. Barr, San Jose, and Paul A. Rohlf, Mountain View, both of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Continuation of Ser. No. 102,680, Aug. 5, 1993, abandoned, which is a continuation of Ser. No. 759,013, Sep. 12, 1991, abandoned, which is a division of Ser. No. 518,388, May 2, 1990, Pat. No. 5,071,766, which is a division of Ser. No. 305,890, Feb. 2, 1989, Pat. No. 4,939,152, which is a division of Ser. No. 102,992, Sep. 30, 1987, Pat. No. 4,845,038. This application Oct. 11, 1994, Ser. No. 321,653

The portion of the term of this patent subsequent to Jul. 5, 2007, has been disclaimed.

Int. Cl.^{6} C12M *3/00;1/24*

U.S. Cl. 435—289.1 **17 Claims**



1. An apparatus for maintaining a biological sample on a support comprising

a hollow tubular member with internal and external surfaces open at first and second opposed ends having a first stop on said internal surface proximate said first end and a second stop on said external surface proximate said second end;

a first closure adapted for sealing attachment to said tubular member at said first end, said first closure comprising a plug adapted to firmly contact said first stop when said first closure is firmly attached to said tubular member, said plug being a hollow cylinder having an open end, a cavity divided by a wall attached to opposed sides of said plug, a closed end formed by a bottom wall having internal and external surfaces, and

a second closure adapted for sealing attachment to said tubular member at said second end and adapted to firmly contact said second stop when said second closure is firmly attached to said tubular member, said second closure being open at a first end and closed by a bottom wall having internal and external surfaces at a second opposed end, and a side wall having internal and external surfaces, the distance between said second open end of said tubular member and said internal surface of said bottom wall when said tubular member is firmly attached to said second closure being less than the diameter of said support and said internal diameter of said tubular member at said second end being less than the diameter of said support.

5,462,876

Patent Not Issued For This Number

5,462,877

METHOD FOR DETERMINING LIPID BOUND SIALIC ACID IN PLASMA OR SERUM

Nonda Katopodis, 10 Greens Cir., Stamford, Conn. 06903

Filed Nov. 5, 1993, Ser. No. 147,881

Int. Cl.^{6} G01N *33/48;31/22*

U.S. Cl. 436—93 **23 Claims**

1. A method of extracting lipid bound sialic acid from human blood plasma or serum and determining the amount of lipid bound sialic acid in a sample of human blood plasma or serum which comprises the following steps:

(a) diluting a predetermined volume of a blood plasma or serum sample with buffer solution to a volume about six (6) times that of the predetermined volume of the sample;

(b) mixing the diluted sample for a suitable period of time to obtain a substantially homogeneous sample;

(c) adding to the sample a mixture of a chlorinated lower alkyl hydrocarbon and a lower alkyl alcohol, the volume of the mixture added being about twenty (20) times the predetermined volume of the blood plasma or serum sample, and the volume ratio of chlorinated hydrocarbon to alcohol in the mixture being about 1:1;

(d) mixing the resulting admixture for a suitable period of time to dissolve matter present in the sample in the chlorinated hydrocarbon/alcohol/buffer mixture;

(e) centrifuging the admixture for a suitable period of time at a suitable speed to permit formation of a substantially clear upper phase;

(f) separately recovering from the clear upper phase so formed a predetermined volume of the upper phase;

(g) adding to the predetermined volume of the clear upper phase a color development reagent;

(h) mixing the resulting admixture;

(i) boiling the admixture;

(j) cooling the admixture;

(k) mixing, then centrifuging said admixture, separating the clear supernatant from the precipitated material; and

(l) determining the amount of lipid bound sialic acid present in the supernatant and thereby the amount present in the blood plasma or serum sample.

5,462,878

METHOD FOR DETERMINING HYDROXY AROMATIC COMPOUNDS

Kris A. Berglund, Okemos; Joel I. Dulebohn, and Beatrice A. Torgerson, both of Lansing, all of Mich., assignors to Board of Trustees operating Michigan State University, East Lansing, Mich.

Filed Sep. 6, 1994, Ser. No. 301,652

Int. Cl.^{6} G01N *33/00*

U.S. Cl. 436—131 **14 Claims**

1. A method for determining the presence of a hydroxy substituted aromatic compound in a solution which comprises:

(a) providing a titanium containing film formed from a reaction of a titanium alkoxide and an aliphatic carboxylic acid which changes light absorbance in the presence of the hydroxy substituted aromatic compound in solution; and

(b) determining the presence of the hydroxy aromatic compound because of a change of light absorbance of the film in contact with the solution when the solution contains the hydroxy substituted aromatic compound.

5,462,879

METHOD OF SENSING WITH EMISSION QUENCHING SENSORS

James G. Bentsen, North St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 14, 1993, Ser. No. 136,967

Int. Cl.^{6} G01N *21/64*

U.S. Cl. 436—136 **32 Claims**

1. A method for sensing the concentration of an analyte in a medium comprising the steps of:

exposing a sensing element to said medium, said sensing element comprising an emissive indicator configured for exposure to a quencher, said quencher comprising said analyte or a substance related to said analyte by a known relationship, and wherein said emissive indicator has a bimolecular quenching rate constant k_q for said quencher and one or more fluoresence liftimes τ_o above a lowest lifetime τ_{oL};

exposing said sensing element to an excitation signal at a radial frequency ω thereby causing said sensing element to emit an analyte concentration dependent signal or signals having a concentration dependent parameter which varies as a function of analyte concentration;

detecting said emitted signal(s) and providing detected signal(s);

univariantly processing at least one of said detected signals to derive the concentration dependent parameter thereby determining the concentration of said analyte in said medium, wherein said sensing element and said excitation signal are configured so as to provide an operating condition where the quantity $\{[(k_q[Q])^2+\omega^2]\tau_o^2\}$ is greater than 4 times the quantity $\{1+2k_q\tau_o[Q]\}$ for all analyte concentrations within the operating range of interest and for all lifetimes τ_o greater than τ_{oL}, where [Q] is the concentration of said quencher in said sensing element.

5,462,880

RATIOMETRIC FLUORESCENCE METHOD TO MEASURE OXYGEN

James Kane, N. Brunswick, N.J.; Roy Martin, Maple Grove, and Anne Schilling, Mahtomedi, both of Minn., assignors to Optical Sensors Incorporated, Minneapolis, Minn.

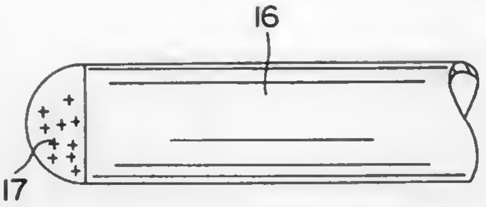
Filed Sep. 13, 1993, Ser. No. 120,593

Int. Cl.^{6} G01N *21/64;* **G02B** *1/08*

U.S. Cl. 436—138 **18 Claims**

1. A method for measuring oxygen in a fluid sample, comprising:

(a) providing an optical sensor comprising an optical waveguide having a distal end portion for contacting the fluid sample, and a proximal end portion for communication with means for



receiving a signal from the distal end portion, and wherein the distal end portion has an oxygen sensor means comprising a cross-linked oxygen-permeable membrane of a cured perfluorinated urethane polymer and, physically entrapped therein, an indicator composition of an oxygen indicator selected from the group consisting of complexes of ruthenium (II), osmium (II), iridium (III), rhodium, rhenium, and chromium (III) with 2,2'-bipyridine, 1,10-phenanthrolene, 4,7-diphenyl-1,10-phenanthrolene, 4,7-dimethyl-1,10-phenanthrolene, 4,7-disulfonated-diphenyl-1,10-phenanthrolene, 2,2'-bi-2-thiazoline, 2,2'-bithiazole, 5-bromo-1,10-phenanthrolene, and 5-chloro-1,10-phenanthrolene, and complexes of VO (II), Cu (II), platinum (II), and zinc (II) with porphyrin, etioporphyrin, tetraphenylporphyrin, mesoporphyrin IX dimethylester, protoporphyrin IX dimethylester and octaethylporphyrin, and wherein the oxygen indicator provides for an oxygen-sensitive fluorescence emission signal, and a reference dye comprising a fluorescent organic compound selected from the group consisting of fluorescein, carboxyfluorescein, hydroxypyrene trisulfonic acid, dichlorofluorescein, N,N'-bis(2,5-di-tert-butylphenyl)-3,4,9,10-perylenecarboximide, and N,N'-bis(2,6-xylidyl)-3,4,9,10-perylenecarboximide, and wherein the reference dye provides for an oxygen-insensitive fluorescence emission signal;

(b) contacting the fluid sample with the distal end portion of the optical sensor;

(c) exciting the indicator composition at using radiation of a first wavelength, to produce an oxygen indicator emission signal at a second wavelength and a reference dye emission signal at a third wavelength;

(d) calculating the apparent quantity of oxygen present in the fluid sample from the oxygen indicator emission signal; and

(e) correcting the apparent quantity of oxygen present for variations resulting from external factors, by determining the ratio of the oxygen indicator emission signal to the reference dye emission signal.

5,462,881

TEMPORARY LIQUID STORAGE CAVITIES IN A CENTRIFUGE TUBE

Daniel Perlman, Arlington, Mass., assignor to Brandeis University, Waltham, Mass.

Continuation-in-part of Ser. No. 215,132, Mar. 18, 1994, abandoned, which is a continuation-in-part of Ser. No. 110,313, Aug. 23, 1993, abandoned. This application Mar. 30, 1994, Ser. No. 219,840

Int. Cl.^{6} G01N *1/10*

U.S. Cl. 436—180 **9 Claims**

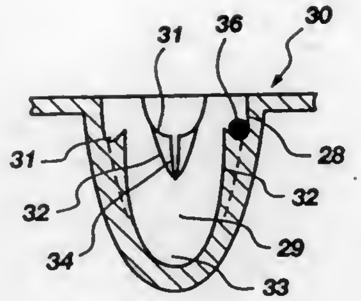
1. A method of controlling delivery of at least one liquid component to a bottom region of a centrifuge tube, said method comprising the steps of:

(a) providing a centrifuge tube comprising:

at least one specimen well defined by an inner perimeter wall and having an upper opening and an opposing bottom region;

at least one ledge formed on said inner wall but not extending around the upper opening so as to define a liquid-holding cavity;

an open-groove liquid drain channel formed on the inner wall and extending downward from the liquid-holding cavity toward the bottom region of the specimen well;



(b) depositing a volume of a liquid component in said liquid-holding cavity for temporary storage of said liquid component, such that no liquid flow of said liquid component from said liquid-holding cavity or beyond said open-groove drain channel occurs under the force of natural gravity; and

(c) applying a centrifugal force to said centrifuge tube to cause flow of said liquid component from said liquid-holding cavity through said drain channel and into said bottom region of said centrifuge tube.

5,462,882

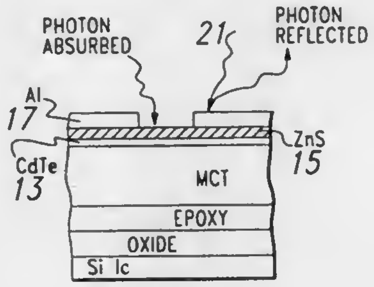
MASKED RADIANT ANNEAL DIFFUSION METHOD

Michael F. Chisholm, Plano, and David I. Forehand, Wylie, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 20,519, Feb. 22, 1993, Pat. No. 5,420,445. This application Oct. 31, 1994, Ser. No. 332,276

Int. Cl.^{6} H01L *31/18;21/324;21/326*

U.S. Cl. 437—5 **28 Claims**



1. A method of fabricating a semiconductor device comprising the steps of:

(a) providing a group II-VI semiconductor wafer having a surface and a passivating layer disposed over said surface to form an interface with said wafer with said passivating layer having an exposed surface opposed to said interface;

(b) masking a region of said exposed surface of said passivating layer with one of a heat energy reflecting layer or a non-photon-transmitting layer with the remainder of said exposed surface being an unmasked region; and

(c) causing interdiffusion of said group II-VI semiconductor wafer and said passivating layer disposed only at said interface of said semiconductor wafer and said passivating layer in said unmasked region by impinging heat energy upon the masked and unmasked regions of said passivating layer when a heat energy reflecting layer is used in step (b) or by impinging light energy upon the masked and unmasked regions of said passivating layer when a non-photon-transmitting layer is used in step (b), the energy impinging upon the mask being reflected therefrom.

5,462,883

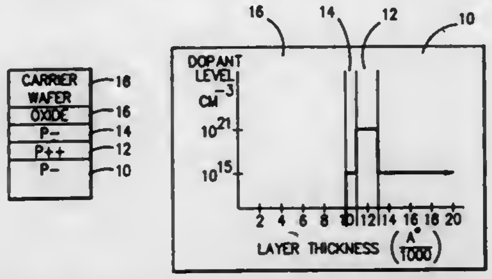
METHOD OF FABRICATING DEFECT-FREE SILICON ON AN INSULATING SUBSTRATE

Robert H. Dennard, Peekskill; Bernard S. Meyerson, Yorktown Heights, and Robert Rosenberg, Peekskill, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 723,091, Jun. 19, 1991, abandoned. This application Apr. 11, 1994, Ser. No. 225,499

Int. Cl.^{6} H01L *21/265*

U.S. Cl. 437—21 **32 Claims**



1. Method of forming a silicon on insulator structure comprising the steps of:

forming an etch stop layer of silicon very heavily doped with a p or n dopant on a silicon substrate, said etch stop layer containing a percentage of germanium sufficient to compensate for stress produced by the very heavy doping concentration;

forming an active layer of lightly doped silicon on said etch stop layer;

forming an insulator layer on said active layer;

forming a carrier substrate on said insulator layer;

removing said silicon substrate; and

removing said etch stop layer thereby forming a substantially dislocation free, uniform silicon active layer on said insulator layer.

5,462,884

METHOD OF MAKING FIELD EFFECT TRANSISTOR WITH T-SHAPED GATE ELECTRODE

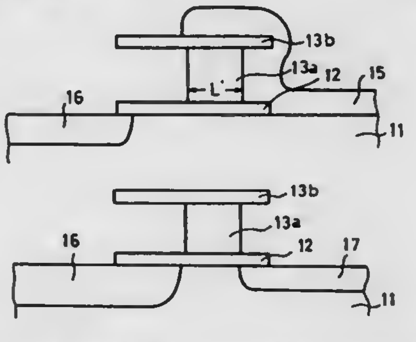
Akihisa Taniguchi, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 958,788, Oct. 9, 1992, Pat. No. 5,384,479. This application Sep. 23, 1994, Ser. No. 312,047

Claims priority, application Japan, Jan. 14, 1991, 3-296354

Int. Cl.^{6} H01L *21/266;21/8252;21/8232*

U.S. Cl. 437—39 **3 Claims**



1. A method of making a semiconductor device comprising the steps of:

depositing a semiconductor epitaxial layer of a first conductivity type on a substrate;

forming an insulating layer on said semiconductor epitaxial layer;

successively depositing a first metal layer and a second metal layer on said insulating layer, said first metal layer being more rapidly etched by a first etchant than said second metal layer;

applying a first resist over said second metal layer;

removing a portion of said first resist, leaving a portion of said first resist in place;

dry-etching the structure with the first etchant using, as a mask, said portion of said first resist left on said second metal layer to form an upper gate electrode section of said second metal layer and a lower gate electrode section of said first metal layer having a shorter gate length than said upper gate electrode section;

removing said first resist from said second metal layer and applying a second resist over said upper and lower gate electrode sections, said insulating layer, and said semiconductor epitaxial layer;

removing a portion of said second resist disposed on one side of the center of said upper gate electrode section, leaving a portion of said second resist in place at a second side of said upper gate electrode section;

dry etching said lower gate electrode section using said second resist as a mask so that the gate length of said second lower gate electrode section is reduced without substantially reducing the gate length of said upper gate electrode section whereby said lower gate electrode section is no centrally disposed relative to said upper gate electrode section;

implanting a dopant impurity producing a second conductivity type opposite to the first conductivity type in said semiconductor epitaxial layer, using said second resist as a mask, to form a precursor source region in said semiconductor epitaxial layer; and

removing all of said second resist and implanting a dopant impurity producing the second conductivity type in said semiconductor epitaxial layer to form source region from said precursor source region and to form a drain region in said semiconductor epitaxial layer spaced from said source region, said source region containing a higher concentration of dopant impurities producing the second conductivity type than said drain region.

5,462,885

METHOD OF MANUFACTURING THIN FILM TRANSISTORS IN A LIQUID CRYSTAL DISPLAY APPARATUS

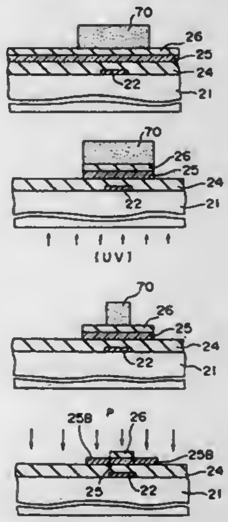
Yasuhiro Nasu; Teruhiko Ichimura, and Tomotaka Matsumoto, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Division of Ser. No. 135,030, Oct. 13, 1993, Pat. No. 5,407,845. This application Dec. 30, 1994, Ser. No. 366,914

Claims priority, application Japan, Jan. 15, 1992, 4-276884; Feb. 26, 1993, 5-38795; Jul. 8, 1993, 5-169288

Int. Cl.^{6} H01L *21/786*

U.S. Cl. 437—40 **9 Claims**



1. A method of manufacturing thin film transistors in a liquid crystal display apparatus, comprising the steps of:

forming a gate electrode;

growing a gate insulator film, a semiconductor active layer and an insulating channel protective film one after another on a region including said gate electrode;

forming a photoresist pattern on said gate electrode and therearound;

patterning to said channel protective film and said semiconductor active layer using said photoresist pattern as a mask;

using said gate electrode as the mask, radiating light from the side of said transparent insulating substrate so as to expose said photoresist pattern and develop it, thereby to change said photoresist pattern into a configuration along the gate electrode;

patterning to said channel protective film using said photoresist pattern through exposure and development in two times as a mask, thereby to expose said semiconductor active layer located on both sides of said gate electrode;

forming a contact region by introducing impurities into said semiconductor active layer exposed outside from the contour of said channel protective film; and

forming a source electrode and a drain electrode connected to said contact region and separated thereon.

5,462,886

METHOD OF MANUFACTURING A SEMICONDUCTOR ELEMENT

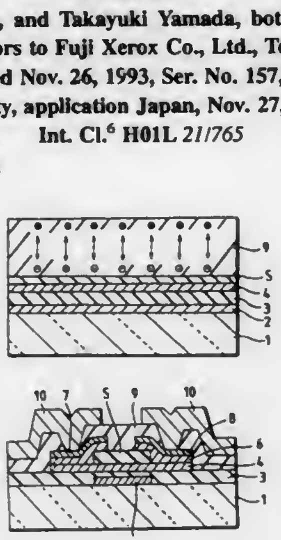
Yoshihiko Sakai, and Takayuki Yamada, both of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Nov. 26, 1993, Ser. No. 157,259

Claims priority, application Japan, Nov. 27, 1992, 4-339514

Int. Cl.⁶ H01L *21/765*

U.S. Cl. 437—41 **5 Claims**



1. A method of manufacturing a semiconductor element, comprising the steps of:

forming a semiconductor layer over a substrate;

placing liquid organic insulating material over said semiconductor layer to form an organic insulating layer while an electric field is applied to said liquid organic insulating material in a direction vertical to said substrate; and

baking said liquid organic insulating material for initial hardening immediately after said placing step while an electric field is applied to said liquid organic insulating material in the direction vertical to said substrate.

5,462,887

PROCESS FOR MAKING A MATRIX OF THIN LAYER TRANSISTORS WITH MEMORY CAPACITORS

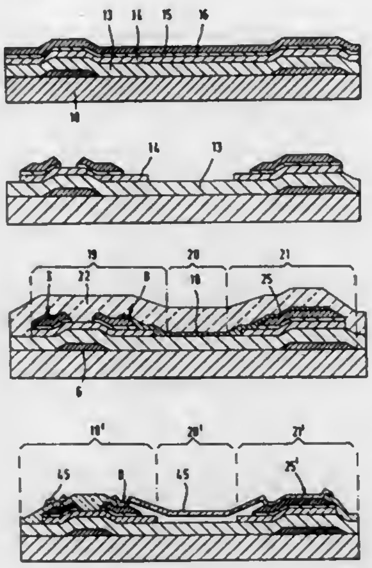
Joachim Glück, Stuttgart, Germany, assignor to Ernst Luder, Stuttgart, Germany

Filed Nov. 22, 1994, Ser. No. 343,108

Claims priority, application Germany, Nov. 22, 1993, 43 39 721.2

Int. Cl.⁶ H01L *21/786*

U.S. Cl. 437—48 **19 Claims**



1. A process for making a matrix of thin layer transistors with memory capacitors comprising the steps of:

a) forming a first electrically conductive layer on a substrate (10) and, in a first mask step, etching the first electrically-conductive layer to form row conductors (11) of the thin layer transistors, gate contacts (G) of the thin layer transistors (19) and ground electrodes (12) of the memory capacitors (21);

b) forming a gate-insulating layer (13) for the thin layer transistors (19) on the first electrically conductive layer on the substrate and the substrate;

c) forming an undoped semiconductor layer (14) on the gate-insulating layer (13) and the substrate (10);

d) forming a p- or n-doped semiconductor layer (15) on the undoped semiconductor layer (14) and the substrate (10) to provide drain and source contacts (D,S) of the thin layer transistors (19);

e) forming a second electrically conductive layer on the doped semiconductor layer and etching the second electrically conductive layer (16) to form column conductors (23) of the thin layer transistors (19), second conductor layers for the drain and source contacts (D,S) of the thin layer transistors (19) and counter electrodes (25) of the memory capacitors (21) in a second mask step;

f) plasma etching of the doped semiconductor layer (15) with the second conductor layer acting as mask and determining when the plasma etching is finished by monitoring optical emission from an etching plasma used for the plasma etching;

g) etching the undoped semiconductor layer (14) in a third mask step;

h) forming a transparent conductive layer thereon and etching the transparent conductive layer (18) to form a screen element electrode (20) and metallizing to form column conductors (23) of thin layer transistors (19) and an electrically conductive connection of the drain contacts (D) of the thin layer transistors (19) with the counter electrodes (25) of the memory capacitors (21) in a fourth mask step; and

i) forming a transparent passivating layer (**22**) over said layers (**13,14,15,16,18**) on said substrate (**10**).

5,462,888

PROCESS FOR MANUFACTURING SEMICONDUCTOR BICMOS DEVICE

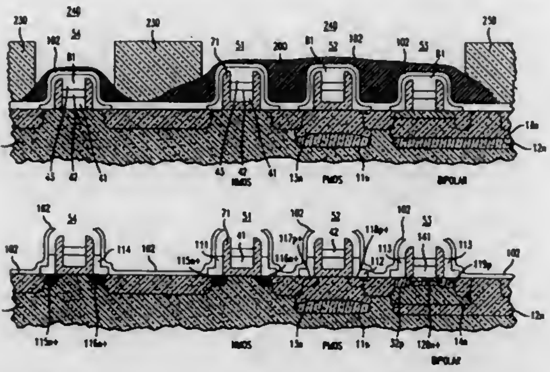
Tzu-Yin Chiu, Martinsville, N.J.; Frank M. Erceg, Bethlehem; Francis A. Krafty, both of Bangor, Pa.; Te-Yin M. Liu, Hsin-Chu, Taiwan, Prov. of China; William A. Possanza, Northampton, Pa., and Janmye Sung, Warren, N.J., assignors to AT&T IPM Corp., Coral Gables, Fla.

Filed Jun. 6, 1994, Ser. No. 254,223

Int. Cl.^{6} H01L *21/70*

U.S. Cl. 437—57 **7 Claims**

1. A process for creating devices in selected areas of a semiconductor substrate wherein stacks of layers of material comprising a first layer of polycrystalline material are formed over portions of the selected areas and wherein the stacks correspond to elements of the devices, comprising: forming a second layer of polycrystalline material over the substrate and the stacks of material formed over the substrate; removing portions of the polycrystalline material of first layers to electrically isolate the individual devices on the substrate; and forming a barrier layer over the second layer of polycrystalline material thereby forming a structure; forming a coating of a resist material comprising a polymer that is not energy sensitive on the surface of the structure; forming an isolation mask over the structure excepting over those areas where the second layer of polycrystalline material overlaps with the first layer of polycrystalline material in the stacks of polycrystalline material and areas within about 1.5 μm or less from the overlapping areas; etching back the barrier layer overlying the area of overlap between the first layer of polycrystalline material and the second layer of polycrystalline material; and etching back the first layer of polycrystalline material that overlaps the second layer of polycrystalline material.



5,462,889

METHOD OF FABRICATING A SEMICONDUCTOR DEVICE WITH A POLYCRYSTALLINE SILICON RESISTIVE LAYER

Michiko Tsukada, and Akio Matsuoka, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 973,967, Nov. 9, 1992, abandoned. This application Jun. 2, 1994, Ser. No. 253,223

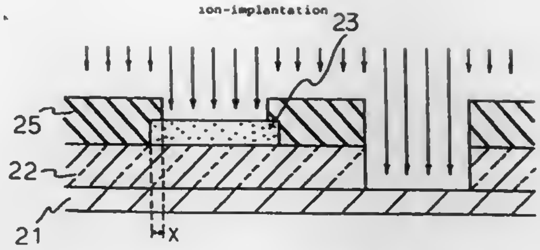
Claims priority, application Japan, Nov. 8, 1991, 3-292944; Nov. 8, 1991, 3-292945

Int. Cl.^{6} H01L *21/70;27/00*

U.S. Cl. 437—60 **10 Claims**

1. A method of fabricating a polycrystalline silicon layer serving as a resistive element involved in a semiconductor integrated circuit device, said method comprising the steps of:

depositing a polycrystalline silicon layer on an insulation layer covering a semiconductor substrate;



subjecting said deposited polycrystalline silicon layer to selective doping by using ion-implantation with employing a photo resist pattern; and

subjecting said doped polycrystalline silicon layer to a selective etching by using a photo resist pattern as a mask so as to have said polycrystalline silicon layer remain at not only said doped area but an undoped peripheral area having a width of 0.5 to 1.5 micrometers,

wherein said peripheral area acts as a buffer preventing variation of area, caused by variations in said selective etching, from occurring in a central portion of said polycrystalline silicon layer.

5,462,890

METHOD FOR MAKING A TUNGSTEN PLUG OF A SEMICONDUCTOR DEVICE

Sung B. Hwang, and Keun Y. Lee, both of Kyoungki-do, Rep. of Korea, assignors to Hyundai Electronics Industries, Co., Ltd., Kyoungki-Do, Rep. of Korea

Filed Oct. 27, 1993, Ser. No. 144,879

Claims priority, application Rep. of Korea, Jan. 30, 1992, 92-20143

Int. Cl.^{6} H01L *21/44;21/285*

U.S. Cl. 437—187 **4 Claims**

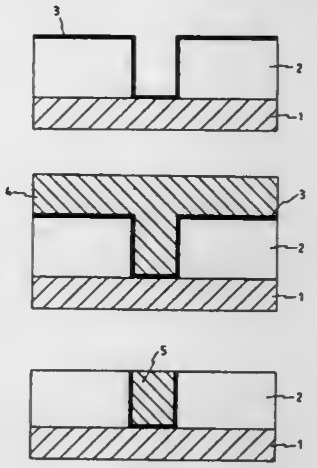
1. A method for making a tungsten plug of a highly integrated semiconductor device, comprising the steps of:

applying an etching process to a region of an insulating film formed on a conductive layer to form a contact hole within said region, said conductive layer being exposed at the region;

adding a reactive gas containing tungsten into hydrogen radical plasma to form a tungsten thin film over said insulating film and said exposed conductive layer, said tungsten thin film having a good adhesiveness to said insulating film and a very thin, uniform thickness;

depositing a blanket tungsten thin film in a thickness on the resulting structure;

applying an etching process to said blanket tungsten thin film and subsequently to said tungsten thin film to expose the upper surface of said insulating film.



5,462,891

PROCESS FOR MANUFACTURING A SEMICONDUCTOR DEVICE USING NH_4OH-H_2O_2 BASED ETCHANT FOR TI BASED THIN FILM

Junji Okada, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

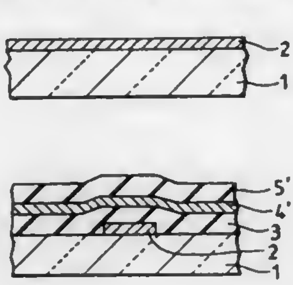
Filed Apr. 22, 1994, Ser. No. 231,293

Claims priority, application Japan, Apr. 23, 1993, 5-119282

Int. Cl.⁶ H01L *21/44;21/48*

U.S. Cl. 437—187 **2 Claims**

1. A process for manufacturing a semiconductor device, comprising the steps of:



- forming a titanium-based thin film on a glass substrate, an SiN_x film, an SiO_2 film, or an a—Si:H film;
- forming a resist pattern of said titanium-based thin film; and
- patterning said titanium-based thin film with an etching solution consisting essentially of ammonia, hydrogen peroxide, and water and having an ammonia concentration of 0.001 to 3 wt %, so as to form a metal electrode or a metal wiring.

5,462,892

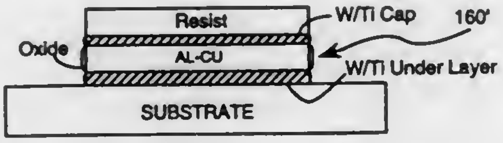
SEMICONDUCTOR PROCESSING METHOD FOR PREVENTING CORROSION OF METAL FILM CONNECTIONS

Calvin T. Gabriel, Cupertino, Calif., assignor to VLSI Technology, Inc., San Jose, Calif.

Continuation of Ser. No. 902,196, Jun. 22, 1992, abandoned. This application Jan. 11, 1994, Ser. No. 180,193

Int. Cl.⁶ H01L *21/283;21/31*

U.S. Cl. 437—189 **18 Claims**



13. A semiconductor wafer processing method having a two dry step process, the method comprising the steps of:
- forming a conductive layer on a semiconductor wafer, said conductive layer being formed from a metal capable of being oxidized;
- forming a masking layer on said conductive layer to define a desired conductive layer interconnect pattern;
- performing a first dry step in a first chamber, said first dry step comprising the step of reactive ion etching said conductive layer and thereby exposing a sidewall of said conductive layer;
- moving said wafer from said first chamber to a second chamber under vacuum, wherein said moving step is performed without intervening exposure to atmospheric moisture; and
- performing a second dry step in said second chamber, said second dry step comprising the step of forming a metal oxide on said exposed sidewall of said conductive layer by heating said wafer in the presence of oxygen, said masking layer preventing the formation of metal oxide on the top of said conductive layer.

5,462,893

METHOD OF MAKING A SEMICONDUCTOR DEVICE WITH SIDEWALL ETCH STOPPER AND WIDE THROUGH-HOLE HAVING MULTILAYERED WIRING STRUCTURE

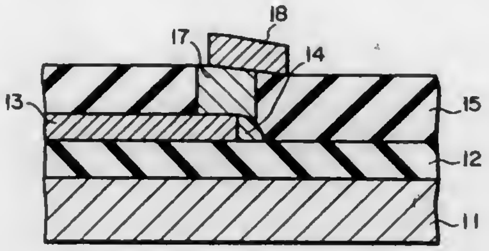
Fumitomo Matsuoka, Kawasaki, and Naoki Ikeda, Yokohama, both of, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Division of Ser. No. 939,425, Sep. 4, 1992, abandoned, which is a continuation of Ser. No. 661,605, Feb. 28, 1991, abandoned. This application Apr. 20, 1994, Ser. No. 231,974

Claims priority, application Japan, Mar. 2, 1990, 2-49500; Feb. 20, 1991, 3-112658

Int. Cl.⁶ H01L *21/44*

U.S. Cl. 437—195 **5 Claims**



1. A method of manufacturing a semiconductor device having a multilayered wiring structure on a semiconductor substrate, comprising the steps of:
- forming a first insulating layer on said semiconductor substrate;
- forming a first wiring layer having a selected wiring width and a selected shape on said first insulating layer;
- forming a protection layer on a side wall of said first wiring layer;
- forming a second insulating layer on the entire surface;
- forming an opening having a width equal to or larger than said wiring width of said first wiring layer reaching a surface of said first wiring layer in said second insulating layer by etching, said protection layer serving as a stopper to prevent said first insulating layer from being etched when a formation position of said opening deviates from said first wiring layer;
- forming a first conductive layer filling said opening; and
- forming a second conductive layer on the entire surface and patterning said second conductive layer, thereby forming a second wiring layer partially connected to said first conductive layer.

5,462,894

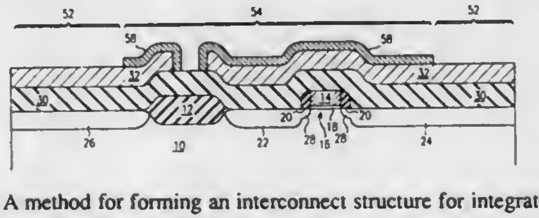
METHOD FOR FABRICATING A POLYCRYSTALLINE SILICON RESISTIVE LOAD ELEMENT IN AN INTEGRATED CIRCUIT

Charles R. Spinner, Dallas, and Fu-Tai Liou, Carrollton, both of Tex., assignors to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

Continuation of Ser. No. 85,972, Jun. 30, 1992, abandoned, which is a division of Ser. No. 741,793, Aug. 6, 1991, Pat. No. 5,268,325. This application Sep. 22, 1994, Ser. No. 310,925

Int. Cl.⁶ H01L *29/8605*

U.S. Cl. 437—195 **5 Claims**



1. A method for forming an interconnect structure for integrated circuit devices, comprising the steps of:
- forming a layer of polycrystalline silicon over an insulating layer;

patterning and etching the polycrystalline silicon layer to define an interconnect portion and resistive load elements, each having an upper surface and side surfaces, wherein portions of the insulating layer are exposed adjacent the interconnect portion and resistive load elements;

forming a masking layer of silicon nitride on the upper surface of the etched polycrystalline silicon layer and the exposed portions of the insulating layer;

patterning and etching the silicon nitride layer to expose the upper and side surfaces of the interconnect portion, while the resistive load elements remain covered thereby;

forming a layer of refractory metal over and in contact with the masking layer and the upper and side surfaces of the interconnect portion of the polycrystalline silicon layer; and

heating the device to cause the refractory metal to react with the polycrystalline silicon in the upper and side surfaces of the interconnect portion, thereby forming a layer of refractory metal silicide on the upper and side surfaces of the interconnect portion.

5,462,895

METHOD OF MAKING SEMICONDUCTOR DEVICE COMPRISING A TITANIUM NITRIDE FILM

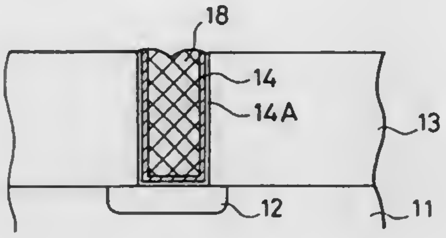
Shih-Chang Chen, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan

Division of Ser. No. 937,380, Aug. 31, 1992, abandoned. This application Aug. 23, 1993, Ser. No. 119,440

Claims priority, application Japan, Sep. 4, 1991, 3-224260; Sep. 4, 1991, 3-224261

Int. Cl.^{6} H01L *21/283*

U.S. Cl. 437—200 **6 Claims**



1. A method of making semiconductor device comprising the steps of:

forming a Ti-rich TiN film in a contact hole formed on a silicon substrate;

forming a stoichiometric TiN film in the contact hole on the Ti-rich TiN film;

forming a blanket film in the contact hole on the stoichiometric TiN film; and

conducting a heat treatment to convert the Ti-rich TiN film into a $TiSi_2$ film before or after the formation of the blanket film;

wherein the formation of the Ti-rich TiN film and the formation of the stoichiometric TiN film are conducted by a continuous CVD process using a gas containing Ti and a gas containing N as source gases, and initially setting the flow ratio between the Ti-containing gas and the N-containing gas to form the Ti-rich TiN film and then altering the flow ratio into a value for forming the stoichiometric TiN film.

5,462,896

METHOD OF FORMING A SIDEWALL ON A SEMICONDUCTOR ELEMENT

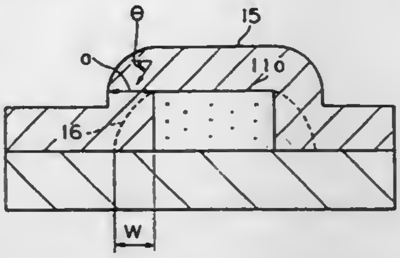
Atushi Komura, Obu; Kenji Kondo, Aichi, and Akira Kuroyanagi, Okazaki, all of, Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jun. 23, 1992, Ser. No. 903,465

Claims priority, application Japan, Jun. 24, 1991, 3-151993; Jan. 18, 1991, 3-271430

Int. Cl.^{6} H01L *21/465*

U.S. Cl. 437—228 **10 Claims**



1. A method of fabricating a semiconductor device comprising the steps of:

depositing silicon (Si)-based insulation material over a substrate having stepped portions provided on a main portion of the substrate, said stepped portions each having a height measured from said main surface thereof, wherein on each of the side surfaces of said stepped portions, a side wall portion comprising said silicon (Si)-based insulation material is provided, a laterally extending portion of said side wall portion having a width which is determined in accordance with said height of said stepped portion; and

etching the silicon-based insulation material by a magnetron-enhanced reactive ion-etching apparatus while pouring onto the etched material carbon-fluoride (CF)-based gas mixed with hydrogen (H), nitrogen (N) or helium (He) gas, the nitrogen and helium gas do not directly contribute to said etching operation, and wherein said etching operation is carried out so as to deposit a polymer formed during said etching step on said sidewall to thereby expand said width of said laterally extending portion of said sidewall portion.

5,462,897

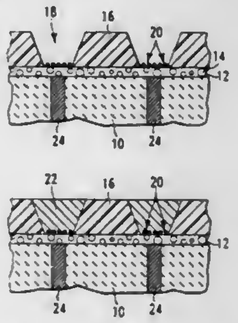
METHOD FOR FORMING A THIN FILM LAYER

Thomas H. Baum, San Jose, Calif.; Shyama P. Mukherjee, Hopewell Junction, N.Y.; Terrence R. O'Toole, Webster, N.Y.; Alice F. Tai, Stormville, N.Y., and Alfred Viehbeck, Fishkill, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 1, 1993, Ser. No. 11,633

Int. Cl.^{6} H01L *21/02;* C23C *26/00*

U.S. Cl. 437—230 **11 Claims**



1. A method for forming a thin film layer on an electronic substrate, the method comprising the steps of:

(a) obtaining a dielectric substrate;

(b) blanket depositing a nonconducting layer of material on the dielectric substrate;

(c) blanket depositing a layer of polymeric dielectric material over the nonconducting layer of material;
(d) patterning said polymeric material so as to form openings to partially expose the underlying layer of nonconducting material;
(e) contacting said exposed underlying layer of nonconducting material with at least one of a palladium, platinum, silver, copper, nickel, or gold salt solution whereby palladium, platinum, copper, silver, nickel, or gold, respectively, is deposited as a seed layer; and
(f) electrolessly plating at least one additional layer of metallization on said seed layer, and within the openings of said polymeric material, the electrolessly plated at least one additional layer of metallization, seed layer and polymeric material all forming at least a part of the final structure.

5,462,898

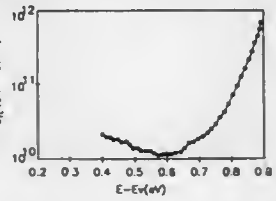
METHODS FOR PASSIVATING SILICON DEVICES AT LOW TEMPERATURE TO ACHIEVE LOW INTERFACE STATE DENSITY AND LOW RECOMBINATION VELOCITY WHILE PRESERVING CARRIER LIFETIME

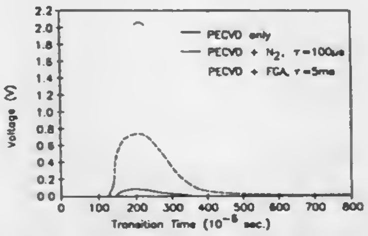
Zhizhang Chen, Duluth, and Ajeet Rohatgi, Marietta, both of Ga., assignors to Georgia Tech Research Corporation, Atlanta, Ga.

Filed May 25, 1994, Ser. No. 249,121

Int. Cl.^{6} H01L *21/02*

U.S. Cl. 437—235 **28 Claims**





1. A method for passivating a surface of crystalline silicon, comprising the steps of:
forming an oxide layer over said crystalline silicon using a plasma enhanced chemical vapor deposition process; and
lowering an interface state density associated with said silicon by heating said oxide layer and said silicon with a light radiating source after said plasma enhanced chemical vapor deposition process.

5,462,899

CHEMICAL VAPOR DEPOSITION METHOD FOR FORMING SIO_2

Yasuo Ikeda, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

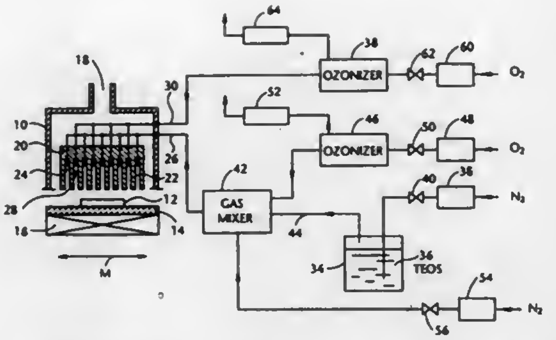
Filed Nov. 30, 1993, Ser. No. 159,235

Claims priority, application Japan, Nov. 30, 1992, 4-320974

Int. Cl.^{6} H01L *21/31;* B05D *1/26;5/12;7/14*

U.S. Cl. 437—238 **9 Claims**

1. A method of forming a silicon oxide film on a substrate surface by chemical vapor deposition, comprising the steps of:
heating a substrate in a reaction chamber;
outside the reaction chamber preparing a gas mixture of an organosilicon compound gas and a first oxygen gas containing ozone, the first oxygen gas having an ozone concentration in the range from 0.1 to 1% by volume, and feeding the gas mixture into the reaction chamber; and
feeding a second oxygen gas containing ozone, the second oxygen gas having an ozone concentration in the range from 1 to 10% by volume and being higher in ozone concentration than said first oxygen gas, directly into the reaction chamber such that the second oxygen gas comes into contact with and mixes with said gas mixture in the vicinity of the substrate surface.



5,462,900

METHOD OF MANUFACTURING SEMICONDUCTOR ELEMENTS WITHOUT BURRS

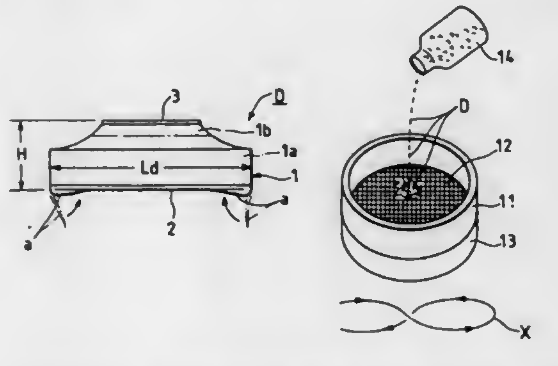
Tetsuro Oki; Koichiro Harada; Ryuichi Neki; Kazuo Kawakami, all of Okayama; Tsuyoshi Miyata, and Kozo Matsuo, both of Kyoto, all of, Japan, assignors to Rohm Co., Ltd., Kyoto, Japan

Filed Sep. 23, 1993, Ser. No. 125,547

Claims priority, application Japan, Mar. 15, 1993, 5-053318

Int. Cl.^{6} H01L *21/463*

U.S. Cl. 437—249 **15 Claims**



1. A method for manufacturing semiconductor elements comprising:
spreading semiconductor elements having ductile metal electrode films formed thereon over a screen arrangement having openings small enough to prohibit the semiconductor elements from passing through it, and
cyclically moving the screen arrangement bearing the semiconductor elements thereon with a periodic motion substantially in a horizontal plane,
whereby burrs extending downwardly from the metal electrode films of the semiconductor elements are cut away or bent toward the metal electrode films of the semiconductor elements.

5,462,901

CERMET SINTERED BODY

Akira Egami, and Masaya Ehira, both of Akashi, Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed May 20, 1994, Ser. No. 246,746

Claims priority, application Japan, May 21, 1993, 5-120253

Int. Cl.^{6} C04B *35/56*

U.S. Cl. 501—87 **11 Claims**

1. A cermet sintered body comprising:

a hard dispersion phase in an amount of from 70 to 95 wt. %, comprising:

TiC and/or Ti(C, N) and

at least one carbide or nitride, excluding TiC, selected from the group consisting of carbides and nitrides of elements in IVa, Va and VIa groups of the periodic system, and

a binder phase in an amount of from 5 to 30 wt. %, comprising at least one element selected from the group consisting of Co, Ni and Fe,

wherein said hard dispersion phase mainly comprises solid-solutions without any structure having a core, and which has a uniform distribution of composition,

said cermet is formed from a raw powder comprising particles of TiC and/or Ti(C, N), wherein all of the TiC and/or Ti(C, N) in said raw powder has an average particle size of 0.8 μm or less, and

said carbide or nitride is dissolved into said particles of TiC and/or Ti(C, N) during sintering, to form said hard dispersion phase.

5,462,902

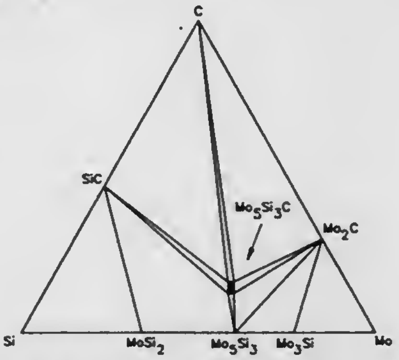
PROCESS FOR PRODUCING DISPERSED PARTICULATE COMPOSITE MATERIALS

Charles H. Henager, Jr., Richland, Wash., and John P. Hirth, Viola, Id., assignors to Battelle Memorial Institute, Richlands, Wash.

Continuation-in-part of Ser. No. 781,021, Oct. 18, 1991, abandoned. This application Nov. 9, 1993, Ser. No. 150,453

Int. Cl.^{6} C04B *35/573*

U.S. Cl. 501—92 **21 Claims**



1. A process for forming a noninterwoven dispersed particulate composite material, which comprises:

forming a multi-layer structure having a plurality of discrete layers comprising at least one discrete layer of a first reactant comprising a metalloid compound and at least one discrete layer of a second reactant comprising a metal compound, the discrete layers being arranged in alternating adjacent layers which are unreactive with each other at room temperature, and at least one of the first reactant and the second reactant having a composition including more than one chemical element; and

heating the multi-layer structure to a temperature wherein interdiffusion between the first and second reactants is initiated, so that at least one element of the first reactant in one discrete layer and at least one element of the second reactant in an alternate adjacent discrete layer undergoes a solid state displacement reaction to form particles of a first reaction product and a second reaction product, the particles of the first reaction product being dispersed within a matrix of the second reaction product to produce said noninterwoven dispersed particulate composite product,

wherein said first reactant is silicon, said second reactant is Mo_2C, said first reaction product is SiC and said second reaction product is $MoSi_2$.

5,462,903

COMPOSITE ALUMINA/METAL POWDERS, CERMETS MADE FROM SAID POWDERS, AND PROCESSES OF PRODUCTION

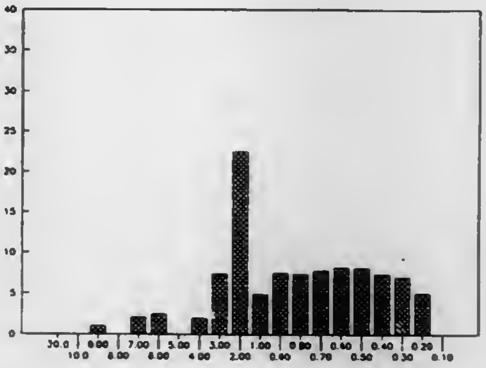
Abel Rousset, Ramonville, and Xavier Devaux, Lanouaille, both of, France, assignors to Centre National De La Recherche Scientifique (C.N.R.S.), Paris, France

Continuation of Ser. No. 856,153, Mar. 24, 1992, Pat. No. 5,338,714. This application May 24, 1994, Ser. No. 248,403

Claims priority, application France, Jul. 24, 1990, 90 09790

Int. Cl.^{6} C04B *35/117*

U.S. Cl. 501—127 **7 Claims**



1. A composite powder of ceramic/metal comprised of micron size grains of alumina and at least one transition metal, and wherein

each micron size grain comprises a compact matrix, having a specific surface area less than 5 m^2/g,

said matrix comprising α alumina (corundum) having a hexagonal structure,

said at least one transition metal being dispersed in each grain at the center of said alumina matrix in the form of crystallites of sizes less than 50 nanometers, and

the ratio by weight of metal/alumina being less than 30%.

5,462,904

PROCESS OF MAKING DEHYDROGENATION CATALYSTS BY OXIDIZING AND SULFIDING CATALYTIC METAL ON A NONACIDIC SUPPORT

Daniel E. Resasco, Norman, Okla.; Bonita K. Marcus, Radnor, Pa.; Chen-Shi Huang, Claymont, Del., and Vincent A. Durante, West Chester, Pa., assignors to Sun Company, Inc. (R&M), Philadelphia, Pa.

Continuation-in-part of Ser. No. 874,499, Apr. 27, 1992. This application Sep. 30, 1994, Ser. No. 316,658

Int. Cl.^{6} C07C *5/333;* **B01J** *27/043*

U.S. Cl. 502—222 **14 Claims**

1. Process for preparing a dehydrogenation catalyst which comprises oxidizing a composition comprising a catalytic metal selected from the group consisting of Group VIIIA first row and Group VIIIA second row metals and a nonacidic microporous support to obtain an oxidized composition, and sulfiding said oxidized composition.

5,462,905

EXHAUST GAS PURIFYING CATALYST

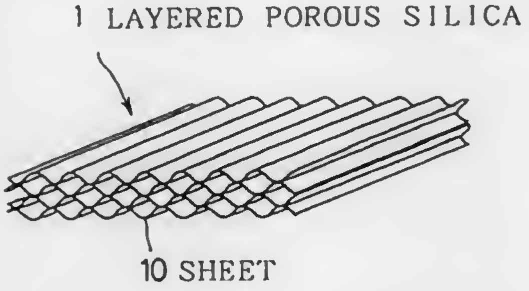
Tetsuo Nagami, Nagoya; Yoshitsugu Ogura; Masahiko Ogai, both of Toyota; Yoshiaki Fukushima, Aichi; Shinji Inagaki, Nagoya; Kazuhiro Fukumoto, Nagoya; Kouji Banno, Nagoya; Yuji Sakakibara, Susono; Yasuo Takada; Takashi Ohta, both of Nagoya; Akane Okada, Oobu; Yukimura Yamada, Ogasa; Kiyotaka Hayashi, Ogasa; Shinji Matsuura, Ogasa, and Kazuyuki Kuroda, Nerima, all of, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, and Toyota Chuo Kenkyusho Kabushiki Kaisha, both of Aichi, Japan

Filed Aug. 13, 1993, Ser. No. 105,932

Claims priority, application Japan, Aug. 21, 1992, 4-222756; Aug. 21, 1992, 4-245698

Int. Cl.^{6} B01J *21/08*

U.S. Cl. 502—232 **4 Claims**



1. An exhaust gas purifying catalyst comprising a support of a layered porous silica or a layered porous silica-metal oxide that comprises a plurality of layered silica sheets, the sheets being curved and partially connected to each other by silicon atoms that constitute the sheets through an oxygen atom, thus forming Si—O—Si bonds to form a three-dimensional structure having a plurality of pores in the diameter range of from 10 to 60 Angstroms, having a surface area in the range of from 4,400 to 4,500 m^2/g and having at least one catalyst metal selected from the group consisting of noble metals, transition metals and rare earth metals, wherein said catalyst metal is loaded on said support.

5,462,906

ESTERIFICATION CATALYST FOR THE PRODUCTION OF HIGH BOILING ESTERS AND PROCESS OF MAKING THE HIGH BOILING ESTERS

Stan Jakubowycz, 504 Albermarle Rd., Bricktownship, Ocean County, N.J. 08724

Filed Dec. 27, 1993, Ser. No. 172,703

Int. Cl.^{6} B01J *21/08;21/12;23/04*

U.S. Cl. 502—232 **4 Claims**

1. A catalyst composition for use in an aqueous environment for the production of high boiling esters by the reaction of an alcohol with an organic acid or anhydride, wherein said catalyst consists essentially of:

(1) sand;
(2) a source of stannous tin; and
(3) an aluminate

wherein said catalyst composition in the presence of water forms stannous and aluminate ions; wherein said source of stannous tin is selected from the group consisting of stannous acetate, stannous tartrate, stannous benzoate, stannous citrate, stannous oxalate, stannous phthalate, stannous sebacate, stannous formate, stannous octoate, dibutyl tin oxide and mixtures thereof;

wherein said aluminate is selected from the group consisting of sodium aluminate, potassium aluminate, magnesium aluminate, cesium aluminate, and mixtures thereof; and

wherein said sand has particle sizes predominately in the range of from about 5 microns to about 18 microns in diameter.

5,462,907

CERIA-ALUMINA OXIDATION CATALYST

Robert J. Farrauto, Westfield; Kenneth E. Voss, Somerville, and Ronald M. Heck, Frenchtown, all of N.J., assignors to Engelhard Corporation, Iselin, N.J.

Continuation of Ser. No. 973,461, Nov. 19, 1992, abandoned, which is a continuation-in-part of Ser. No. 798,437, Nov. 26, 1991, abandoned. This application May 23, 1994, Ser. No. 247,625

Int. Cl.^{6} B01J *21/04;23/42;23/63*

U.S. Cl. 502—304 **13 Claims**

1. An oxidation catalyst composition comprises a refractory carrier on which is disposed a coating of a ceria-alumina catalytic material consisting essentially of a combination of ceria having a BET surface area of at least about 10 m^2/g and alumina having a BET surface area of at least about 10 m^2/g, the ceria and alumina each comprising from about 5 to 95 percent by weight of the combination, and from about 0.1 g/ft^3 to about 0.5 g/ft^3 of platinum dispersed on the catalytic material.

5,462,908

ORGANIC AMINE IMPREGNATED ACTIVATED CARBON

Septimus H.-C. Liang; Brian H. Harrison, both of Nepean, and Jack Pagotto, Kanata, all of, Canada, assignors to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Ottawa, Canada

Filed Jun. 16, 1993, Ser. No. 77,110

Int. Cl.^{6} B01J *20/22;20/02*

U.S. Cl. 502—401 **21 Claims**

1. A breathing gas filter composition providing protection against toxic perfluorocarbons, comprising substantially dry activated carbon and an organic amine impregnant, said organic amine being selected from the group consisting of substituted amines, amides and sulfonamides in an amount of 1.5 to 18% by weight, based on the weight of the carbon and additionally comprising 0.1 to 10% by weight, based on the weight of the carbon of an alkaline hydroxide.

5,462,909

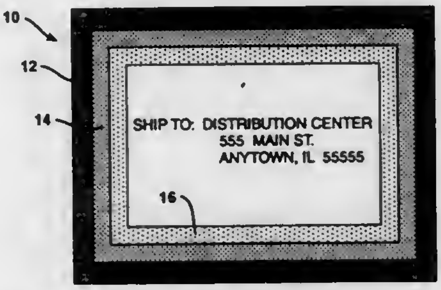
COLOR CODED, THERMALLY IMAGABLE BUSINESS FORM

A. Dale Lakes, Dayton; Patrick A. Konkol, Cincinnati, both of Ohio, and Edward M. Ribar, Phoenix, Ariz., assignors to The Standard Register Company, Dayton, Ohio

Filed Apr. 4, 1994, Ser. No. 222,230

Int. Cl.^{6} B41M *5/30;5/34;5/40*

U.S. Cl. 503—201 **13 Claims**



7. A method for making a color coded business form comprising the steps of:

providing a thermally imagable substrate having first and second surfaces, said first surface of said substrate having thereon a thermally imagable coating which is activated by heat to form a color,

preprinting over said thermally imagable coating different colored areas on selected portions of said first surface of said thermally imagable substrate which are of a different color than the color of said thermally imagable coating;

thermally imaging said substrate in one or more selected areas such that at least one of said different colored areas on said substrate is obscured to provide color coded information.

5,462,910

COMPOSITION FOR FIXING WATER-COLOR INK, COVER FILM FOR THERMAL TRANSFER IMAGE USING COMPOSITION FOR FIXING WATER COLOR-INK, AND THERMAL TRANSFER IMAGE RECORDED MEDIUM

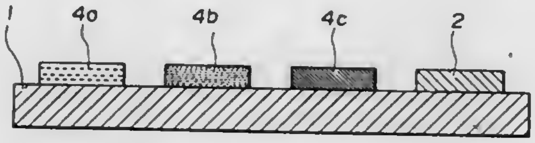
Kengo Ito; Motohiro Mizumachi; Yoshio Fujiwara, and Satoru Shinohara, all of Miyagi, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Aug. 12, 1994, Ser. No. 290,718

Claims priority, application Japan, Dec. 14, 1992, 4-333027; Apr. 27, 1993, 5-125445

Int. Cl.^{6} B41M *5/035;5/38*

U.S. Cl. 503—227 1 Claim



1. A thermal transfer image forming material comprising an ink layer and a water-color ink fixing layer formed on a base material without stacking on each other, the ink layer containing a dye for image formina, the water-color ink fixing layer containing an ion exchanger, the water-color ink fixing layer being peelably formed on the base material.

5,462,911

THERMAL TRANSFER IMAGE-RECEIVING SHEET

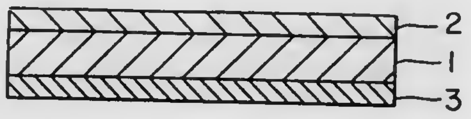
Shino Takao; Shinji Kometani, and Hitoshi Saito, all of Tokyo, Japan, assignors to Dai Nippon Printing Co., Ltd., Japan

Filed Sep. 21, 1994, Ser. No. 307,449

Claims priority, application Japan, Sep. 24, 1993, 5-258841; Jan. 5, 1993, 5-271171; Jan. 10, 1994, 6-012073

Int. Cl.^{6} B41M *5/035;5/38*

U.S. Cl. 503—227 17 Claims



1. A thermal transfer image-receiving sheet comprising a substrate sheet, a dye-receptive layer provided on one surface of said substrate sheet and a dye-unreceptive layer provided on the other surface of said substrate sheet, said dye-unreceptive layer comprising a composition including (a) at least one vinyl resin having at least a hydroxyl group and (b) one of an isocyanate compound and a chelate compound.

5,462,912

AGRICULTURAL CHEMICAL COMPOSITION ENHANCER COMPRISING QUATERNARY DI(POLYOXYALKYLENE) AMMONIUM ALKYL SULFATES

Yuichi Hioki; Kazuhiko Kurita; Keiko Kawabata, and Toshikazu Azuma, all of Wakayama, Japan, assignors to Kao Corporation, Tokyo, Japan

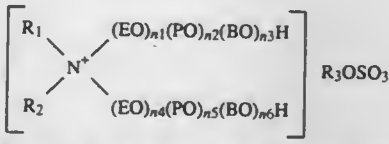
Continuation of Ser. No. 957,819, Oct. 8, 1992, abandoned. This application Sep. 14, 1994, Ser. No. 305,731

Claims priority, application Japan, Jan. 9, 1991, 3-262014

Int. Cl.^{6} A01N *25/30*

U.S. Cl. 504—116 24 Claims

1. An agricultural chemical composition (1) comprising a mixture of compounds represented by the following general formula (I) and having (n1+n2+n3) and (n4+n5+n6) each being a number of 0 to 100 on the average and an agricultural chemical, wherein the weight ratio of the mixture to the agricultural chemical ranges from 0.1 to 50:



(I)

wherein R_1 and R_2 each represent a straight-chain or branched alkyl, alkenyl or hydroxyalkyl group having from 1 to 30 carbon atoms; R_3 represents a straight-chain or branched alkyl group having from 1 to 4 carbon atoms;

$(EO)_{n1}$ and $(EO)_{n4}$ each represent a polyoxyethylene chain;
$(PO)_{n2}$ and $(PO)_{n5}$ each represent a polyoxypropylene chain;
$(BO)_{n3}$ and $(BO)_{n6}$ each represent a polyoxybutylene chain;
n1, n2, n3, n4, n5 and n6 each are 0 or a positive integer; and
(n1+n2+n3) and (n4+n5+n6) each are 0 or a positive integer provided that at least one of (n1+n2+n3) and (n4+n5 +n6) is 1 or more.

5,462,913

SUBSTITUTED 1-H-3-ARYL-PYRROLIDINE-2,4-DIONE DERIVATIVES

Reiner Fischer, Monheim; Thomas Bretschneider, Siegburg; Bernd-Wieland Krüger, Bergisch Gladbach; Christoph Erdelen, Leichlingen; Hans-Joachim Santel, Leverkusen; Klaus Lürssen; Robert R. Schmidt, both of Bergisch Gladbach; Ulrike Wachendorff-Neumann, Monheim, and Wilhelm Stendel, Wuppertal, all of, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

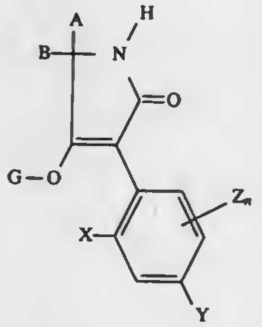
Filed Oct. 21, 1993, Ser. No. 140,635

Claims priority, application Germany, Jan. 28, 1992, 42 36 401.9; Aug. 11, 1993, 43 26 909.5

Int. Cl.^{6} A61K *31/535;* **A01N** *43/38;* **C07D** *413/04;413/14*

U.S. Cl. 504—138 6 Claims

1. A substituted 1-H-3-arylpyrrolidine-2,4-dione derivative of the formula



in which

A and B together with the carbon atom to which they attach represent a C_3–C_8-spirocycle which is monosubstituted or polysubstituted by alkyl, cycloalkyl, haloalkyl, alkoxy, thioalkyl, halogen or phenyl, or

A, B and the carbon atom to which they are attached represent a C_3–C_8-spirocycle which is substituted by an alkylenediyl group which is optionally interrupted by one or two oxygen and/or sulphur atoms or by an alkylenedioxyl or an alkylenedithioyl group, which group, together with the carbon atom to which it is bonded, forms a further five- to eight-membered spirocycle, or

A, B and the carbon atom to which they are attached represent a C_3–C_6-spirocycle in which two substituents together with the C-atoms to which they are bonded represent a saturated or unsaturated cycle which is optionally substituted by alkyl, alkoxy or halogen and which is optionally interrupted by oxygen or sulphur atoms,

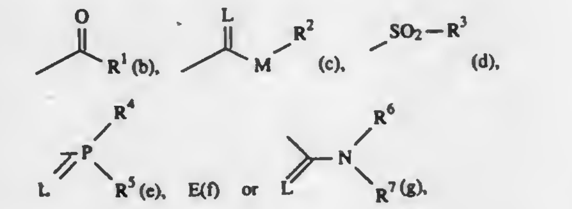
X represents C_1–C_6-alkyl, halogen or C_1–C_6-alkoxy,

Y represents hydrogen, C_1–C_8-alkyl, halogen, C_1– C_6-alkoxy or C_1–C_3-halogenoalkyl,

Z represents C_1–C_6-alkyl, halogen or C_1–C_6-alkoxy,

n represents 0, 1, 2 or 3,

G represents hydrogen (a) or the groups



in which

E represents a metal ion equivalent or an ammonium ion and

L and M in each case represent oxygen and/or sulphur,

R^1 represents in each case optionally halogen-substituted C_1–C_{20}-alkyl, C_3–C_{20}-alkenyl, C_1–C_8-alkoxy-C_2–C_8-alkyl, C_1–C_8-alkylthio-C_2–C_8-alkyl, C_1–C_8-polyalkoxy-C_2–C_8-alkyl or cycloalkyl which has 3 to 8 ring atoms and which is optionally interrupted by oxygen and/or sulphur atoms,

or represents phenyl which is optionally substituted by halogen, nitro, C_1–C_6-alkyl, C_1–C_6-alkoxy, alkoxy, -halogenoalkyl or alkoxy, -halogeno-alkoxy,

or represents phenyl-C_1–C_6-alkyl which is optionally substituted by halogen, C_1–C_6-alkyl, C_1–C_6-alkoxy, C_1–C_6-halogenoalkyl or C_1–C_6-halogenoalkoxy,

or represents hetaryl which is optionally substituted by halogen and/or C_1–C_6-alkyl,

or represents phenoxy-C_1–C_6-alkyl which is optionally substituted by halogen and C_1–C_6-alkyl,

or represents hetaryloxy-C_1–C_6-alkyl which is optionally substituted by halogen, amino and C_1– C_6-alkyl,

R^2 represents in each case optionally halogen-substituted C_1–C_{20}-alkyl, C_3–C_{20}-alkenyl, C_1–C_8-alkoxy-C_2–C_8-alkyl, C_1–C_8-polyalkoxy-C_2–C_8-alkyl or, or represents phenyl, or benzyl, in each case optionally substituted by halogen, nitro, C_1–C_6-alkyl, C_1–C_6-alkoxy or C_1–C_6-halogenoalkyl,

R^3, R^4 and R^5 independently of one another represent in each case optionally halogen-substituted C_1– C_8-alkyl, C_1–C_8-alkoxy, C_1–C_8-alkylamino, di-(C_1– C_8)-alkylamino, C_1–C_8-alkylamino, C_2–C_3-alkenylthio, C_3–C_7-cycloalkylthio, or represent phenyl, phenoxy or phenylthio, in each case optionally substituted by halogen, nitro, cyano, C_1–C_4-alkoxy, C_1–C_4-halogenoalkoxy, C_1–C_4-alkylthio, C_1– C_4-halgenoalkylthio, C_1–C_4-alkyl or C_1–C_4-halogenoalkyl,

R^6 and R^7 independently of one another represent hydrogen, or represent in each case optionally halogen-substituted C_1–C_8-alkyl, C_3–C_8-cycloalkyl, C_1–C_8-alkoxy, C_3–C_8-alkenyl or C_1–C_8-alkoxy-C_2–C_8-alkyl, or represent phenyl which is optionally substituted by halogen, C_1–C_8-halogenoalkyl, C_1–C_8-alkyl or C_1–C_8-alkoxy, or represent benzyl which is optionally substituted by halogen, C_1– C_8-alkyl, C_1–C_8-halogenoalkyl or C_1–C_8-alkoxy, or together represent a C_3–C_8-alkylene ring which is optionally interrupted by oxygen or sulphur.

5,462,914

HERBICIDAL N-CYANOPYRIDAZINONES

Harald Leitner, Oftering; Rudolf H. Wörther, Linz; Horst Korntner, Linz; Rudolf Schneider, Linz; Engelbert Auer; Dietmar Kores, both of Leonding, and Hermann Tramberger, Seitenstetten, all of, Austria, assignors to Sandoz Ltd., Basel, Switzerland

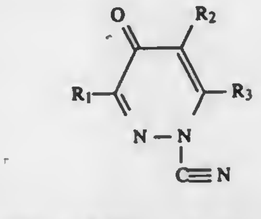
Continuation-in-part of Ser. No. 11,900, Feb. 1, 1993, abandoned. This application Apr. 1, 1994, Ser. No. 221,464

Claims priority, application Austria, Feb. 17, 1992, 258/92

Int. Cl.^{6} A01N *43/58*

U.S. Cl. 504—238 **9 Claims**

1. N-cyanopyridazinones of the formula:



in which R_2 denotes hydrogen, Cl or Br, R_1 and R_3 are the same and each denote Cl, Br or I or R_1 or R_3 denote Cl, Br, I, alkoxy having 1 to 8 carbon atoms, phenyl, which is unsubstituted or mono- or disubstituted by hydroxyl, halogen, cyano, nitro, amino, alkylamino having 1–4 C atoms, dialkylamino, each alkyl having 1–4 C atoms, straight-chain or branched alkyl having 1–10 C atoms being unsubstituted or mono-substituted by cyano or mono to trisubstituted by halogen; cycloalkyl having 5–7 C atoms, cycloalkoxy having 5–7 C atoms, phenyl, phenoxy, alkylthio or alkylsulfonyl having 1–4 C atoms; or trisubstituted by chlorine.

5,462,915

PROCESS FOR PRODUCING MICROCAPSULES

Ralston Curtis, Mountain View; Rakesh Jain, Gilroy, both of Calif.; David C. Creech, Yuma, Ariz., and William L. Fitch, Palo Alto, Calif., assignors to Sandoz Ltd., Basel, Switzerland

Continuation of Ser. No. 907,884, Jul. 2, 1992, abandoned, which is a continuation-in-part of Ser. No. 675,847, Mar. 27, 1991, abandoned, and a continuation-in-part of Ser. No. 663,195, Feb. 21, 1991, abandoned, which is a continuation of Ser. No. 413,795, Sep. 28, 1989, abandoned. This application Feb. 24, 1994, Ser. No. 201,148

Int. Cl.^{6} A01N *25/28;* **B01J** *13/18;13/20*

U.S. Cl. 504—323 **5 Claims**

1. A process for producing microcapsules by

a) adding to a suspension of a substance to be microencapsulated in a liquid a urea-, thiourea- or melamine-formaldehyde prepolymer or mixtures thereof, and

b) curing said prepolymer to provide a crosslinked polymer enclosing the substance to be microencapsulated wherein the improvement comprises heat-curing the microcapsules thus obtained at a temperature of >100° C.

5,462,916

SUPERCONDUCTIVE OPTOELECTRONIC DEVICES WITH THE BASIC SUBSTANCE Bi_2O_3 OF SUPERCONDUCTIVE-CONJUGATE PHOTOCONDUCTIVITY

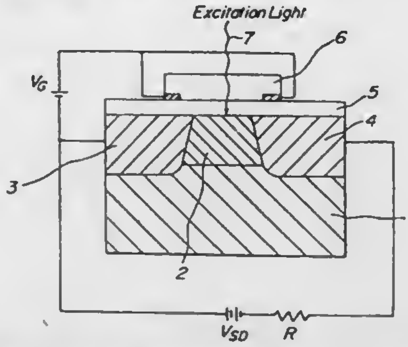
Taizo Masumi, Yokohama, Japan, assignor to The University of Tokyo, Tokyo, Japan

Continuation of Ser. No. 739,373, Aug. 2, 1991, abandoned. This application Feb. 14, 1994, Ser. No. 195,833

Claims priority, application Japan, Aug. 3, 1990, 2-205264

Int. Cl.^{6} H01L *39/22;39/12;* **H01B** *12/00*

U.S. Cl. 505—182 **7 Claims**



1. A superconductive optoelectronic device, comprising a substrate, a photoconductive gate region formed on the substrate, and a source region and a drain region formed on the substrate at opposite sides of the gate region respectively so as to face toward each other across the gate region, and means for supplying bias voltage between said source region and drain region, said source and drain regions being made of a Bi-based superconductive oxide material, said gate region being made of

(a) a basic substance Bi_2O_3 or

(b) Bi_2O_3 having a rhombohedral layered structure formed and stabilized by adding therein at least one divalent element selected from the group consisting of Sr, Ca, and Cu

which reveals photoconductivity at a temperature below critical temperature for superconductivity of said superconductive oxide material, whereby an electric current flowing between said source and drain regions is controlled in accordance with intensity of light which is made incident upon the gate region.

5,462,917

PROCESS OF PREPARING SUPERCONDUCTIVE OXIDE COMPLEXES CONTAINING L, BA, CU AND O AND METHOD OF USING THE SAME

Kamel Salama, and Venkatakrishnan Selvamanickam, both of Houston, Tex., assignors to University of Houston-University Park, Houston, Tex.

Division of Ser. No. 753,012, Aug. 23, 1991, Pat. No. 5,306,697, which is a continuation of Ser. No. 477,311, Feb. 8, 1990, abandoned, which is a continuation-in-part of Ser. No. 309,382, Feb. 10, 1989, Pat. No. 4,956,336. This application Feb. 14, 1994, Ser. No. 194,941

The portion of the term of this patent subsequent to Sep. 11, 2007, has been disclaimed.

Int. Cl.^{6} H01L *39/12;* **H01B** *12/16;* **C04B** *35/653;* **C01F** *11/02*

U.S. Cl. 505—150 **20 Claims**

1. A process for preparing a superconducting metal oxide complex comprising the steps of:

(a) mixing solid compounds containing L, Ba, Cu, and O in amounts appropriate to yield the formula $L_1Ba_2Cu_3O_{6+\delta}$ wherein L is a rare earth element and δ has a number value of from about 0.5 to about 1.0;

(b) heating the solid compounds at a temperature and for a time sufficient to react the compounds in the solid state;

(c) cooling the solid state reaction product to ambient temperature;

(d) compacting the cooled solid state reaction product into a solid mass by application of pressure;

(e) sintering the compacted mass at a temperature between about 40° C. to about 90° C. below its melting point;

(f) heating the sintered mass in a preheated chamber to a temperature of from about 80° C. to 190° C. above its melting point for a time sufficient to partially melt and decompose said sintered mass;

(g) rapidly cooling the heated mass to a temperature between about 10° C. to 40° C. above its melting point and then slowly cooling the rapidly cooled mass to a steady temperature between about 20° C. to 40° C. below its melting point at a rate of approximately 1° C./hour;

(h) maintaining the slowly cooled mass at said steady temperature for a time sufficient for the entire slowly cooled mass to resolidify; and

(i) annealing the resolidified mass in an oxygen containing atmosphere for a time sufficient for the requisite amount of oxygen to diffuse into the resolidified mass.

5,462,918

SUPERCONDUCTING FIELD EFFECT DEVICE WITH VERTICAL CHANNEL FORMED OF OXIDE SUPERCONDUCTOR MATERIAL

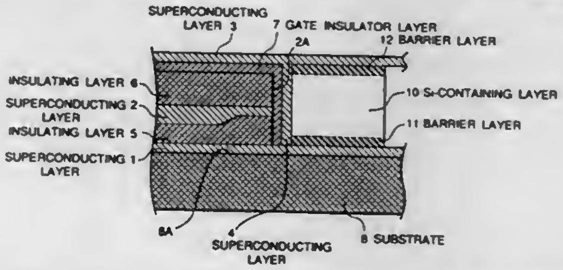
Takao Nakamura; Hiroshi Inada, and Michitomo Iiyama, all of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Japan

Continuation of Ser. No. 784,934, Oct. 31, 1991, abandoned. This application May 26, 1994, Ser. No. 249,478

Claims priority, application Japan, Jan. 31, 1990, 2-294290; Jan. 31, 1990, 2-294291; Jan. 31, 1990, 2-294292; Jan. 31, 1990, 2-294293

Int. Cl.^{6} H01B *12/00;* **H01L** *39/22;* **B05D** *5/12*

U.S. Cl. 505—193 **13 Claims**



1. A superconducting FET device comprising a stacked structure including:

a substrate,

a first superconducting layer provided on the substrate,

a first insulating layer provided on the first superconducting layer,

a second superconducting layer provided on the first insulating layer,

a second insulating layer provided on the second superconducting layer,

a third superconducting layer provided on the second insulation layer,

the stacked structure having an end surface extending from the first insulating layer to the second insulating layer,

a fourth superconducting layer formed to cover the end surface of the stacked structure and,

a third insulating layer which separates the stacked structure end surface and the fourth superconducting layer and prevents tunnel current therebetween, the fourth superconducting layer being in electric connection with the first and third superconducting layers and being isolated from the second superconducting layer by the third insulating layer, the first, second, third and fourth superconducting layers being formed with an oxide superconductor thin film wherein

the first and third superconducting layers constitute a source and drain region, and the fourth superconducting layer constitutes a channel layer extending between the source and drain regions, and the second superconducting layer constitutes a gate electrode, whereby a current through the fourth superconducting layer between the first and the third superconducting layers is controlled by an electric field which is created by a voltage applied to the second superconductor layer and which acts on the fourth superconducting layer.

5,462,919

METHOD FOR MANUFACTURING SUPERCONDUCTING THIN FILM FORMED OF OXIDE SUPERCONDUCTOR HAVING NON SUPERCONDUCTING REGION AND DEVICE UTILIZING THE SUPERCONDUCTING THIN FILM

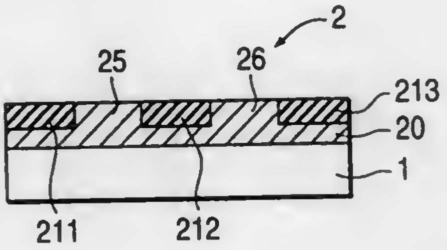
So Tanaka, and Michitomo Iiyama, both of Osaka, Japan, assignors to Sumitomo Electric Industries,Ltd., Osaka, Japan

Division of Ser. No. 936,668, Aug. 28, 1992, abandoned. This application Feb. 18, 1994, Ser. No. 198,362

Claims priority, application Japan, Aug. 28, 1991, 3-242801; Aug. 28, 1991, 3-242802

Int. Cl.^{6} B05D *5/00;* **B44C** *1/22*

U.S. Cl. 505—410 **22 Claims**



1. A method for manufacturing a superconducting thin film having at least one non-superconducting region at and near its surface portion, the method comprising the steps of:

forming on a surface of a substrate a thin film of an oxide superconductor that comprises oxide superconductor crystals,

heating the oxide superconductor thin film in high vacuum environment so that oxygen of the oxide superconductor crystals of the oxide superconductor thin film escapes from the surface of the oxide superconductor thin film and a surface portion of the oxide superconductor thin film having a substantial thickness changes into a non-superconducting layer of a compound oxide which is composed of the same constituent elements as the oxide superconductor but which includes an amount of oxygen less than that of the oxide superconductor, thereby forming a thin superconducting channel under the non-superconducting layer,

selectively masking a portion of the non-superconducting layer which will become a non-superconducting region, and

heating the masked non-superconducting layer in an oxidation atmosphere so that oxygen penetrates into an exposed portion of the non-superconductor layer and the compound oxide of the exposed portion of the non-superconductor layer changes into oxide superconductor which is electrically connected to the superconducting channel.

5,462,920

METHOD OF PREPARING OXIDE SUPERCONDUCTING WIRE

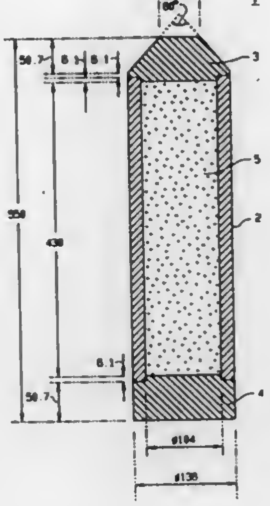
Hidehito Mukai; Kenichi Sato, and Nobuhiro Shibuta, all of Osaka, Japan, assignors to Sumitomo Electric Industries, Inc., Osaka, Japan

Continuation of Ser. No. 854,127, Mar. 19, 1992, Pat. No. 5,369,088. This application Aug. 24, 1994, Ser. No. 295,297

Claims priority, application Japan, Mar. 20, 1991, 3-56685

Int. Cl.^{6} H01L *39/00;* **H01B** *12/00*

U.S. Cl. 505—432 **5 Claims**



1. A method of preparing an oxide superconducting wire, comprising the steps of:

filling up a metal billet with raw material powder for an oxide superconductor;

degassing said metal billet;

sealing said degassed metal billet;

applying hydrostatic extrusion on said sealed metal billet;

deformation processing said extruded metal billet to elongate said extruded metal billet; and

heat treating the extruded metal billet for sintering said raw material powder to form the oxide superconductor.

5,462,921

METHOD OF FORMING HG-CONTAINING OXIDE SUPERCONDUCTING FILMS

Hideaki Adachi; Kentaro Setsune, both of Osaka, and Koichi Mizuno, Nara, all of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed May 9, 1994, Ser. No. 239,963

Claims priority, application Japan, May 14, 1993, 5-112848; Jan. 15, 1993, 5-258163; Dec. 16, 1993, 5-316191

Int. Cl.^{6} B05D *5/12*

U.S. Cl. 505—473 **10 Claims**

1. A method of fabricating a thin-film superconductor, comprising the steps of:

forming a thin film on a substrate, said thin film containing mercury, an alkaline earth element, and copper as main components thereof; and

subjecting said substrate with the thin film to a heat treatment in an atmosphere containing oxygen at a concentration corresponding to an oxygen partial pressure of $1/500$ to $1/10$ atm, to change said thin film into the thin-film superconductor.

5,462,922

SUPERCONDUCTIVE MATERIAL, A SUPERCONDUCTIVE BODY, AND A METHOD OF FORMING SUCH A SUPERCONDUCTIVE MATERIAL OR BODY

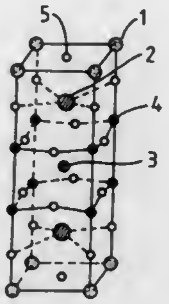
Toshiya Doi; Takeshi Ozawa; Kazuhide Tanaka; Toyotaka Yuasa, all of Hitachi; Tomoichi Kamo, and Shinpei Matsuda, both of Toukai, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 27, 1992, Ser. No. 858,711

Claims priority, application Japan, Mar. 29, 1991, 3-066601; Jun. 24, 1991, 3-151337

Int. Cl.^{6} H01B *12/00;* **H01L** *39/12*

U.S. Cl. 505—785 **15 Claims**



1. A superconductive body comprising at least one superconductive material selected from the group consisting of:

I. $(Tl_{1-X1-X2}Pb_{X1}Bi_{X2})_{\alpha}(Sr_{1-X3}Ba_{X3})_{2\beta}Ca_{2\gamma}Cu_{3\delta}O_{\zeta}$ where
$0 \leqq X1 \leqq 0.8$
$0 \leqq X2 \leqq 0.5$
$0 \leqq X3 \leqq 1.0$
$0.7 \leqq \alpha \leqq 1.5$
$0.7 \leqq \beta \leqq 1.5$
$0.7 \leqq \gamma \leqq 1.5$
$0.7 \leqq \delta \leqq 1.5$
$6.0 \leqq \zeta \leqq 14.0$
$0 < X1+X2 < 0.6$,

II. $(Tl_{1-X1-X2}Pb_{X1}Bi_{X2})_{\alpha(Sr1-X3}Ba_{X3})_{2\beta}Ca_{\gamma}Cu_{2\delta}O_{7\theta}$ where
$0 \leqq X1 \leqq 0.8$
$0 \leqq X2 \leqq 0.5$
$0 \leqq X3 \leqq 1.0$
$0.7 \leqq \alpha \leqq 1.5$
$0.7 \leqq \beta \leqq 1.5$
$0.7 \leqq \gamma \leqq 1.5$
$0.7 \leqq \delta \leqq 1.5$
$4.5 \leqq \zeta \leqq 11.0$
$0 < X1+X2 < 0.6$, and

III. $(Tl_{1-X1-X2}Pb_{X1}Bi_{X2})_{\alpha}(Sr_{1-X3}Ba_{X3})_{2\beta}Ca_{3\gamma}Cu_{4\delta}O_{\zeta}$ where
$0 \leqq X1 \leqq 0.8$
$0 \leqq X2 \leqq 0.5$
$0 \leqq X3 \leqq 1.0$
$0.7 \leqq \alpha \leqq 1.5$
$0.7 \leqq \beta \leqq 1.5$
$0.7 \leqq \gamma \leqq 1.5$
$0.7 \leqq \delta \leqq 1.5$
$7.4 \leqq \zeta \leqq 17.0$
$0 < X1+X2 < 0.6$,

and containing at least one non-superconductive material including an oxide of at least one element selected from the group consisting of elements in said superconductive material; said at least one non-superconductive material providing pinning centers within the superconductive body; said superconductive body exhibiting a Jc of at least 10,000 A/cm^2 under a magnetic field of 1 Tesla at 77 K.

5,462,923

1-OXO-SUBSTITUTED AND UNSUBSTITUTED ISOBUTYL-4-ETHOXY-BENZENES AND MIXTURES THEREOF WITH BICYCLOPENTADIENE DERIVATIVES, USES OF SAME IN PERFUMERY AND METHODS FOR PREPARING SAME

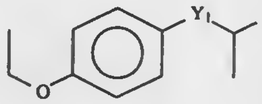
Michael G. Monteleone, Hazlet; Richard A. Weiss, Pine Brook; Mark D. Evans, Plainsboro, and Marie R. Hanna, Keyport, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Sep. 2, 1994, Ser. No. 299,966

Int. Cl.^{6} A61K *7/46*

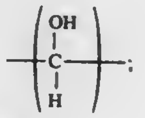
U.S. Cl. 512—19 **24 Claims**

1. An 1-oxo-substituted or unsubstituted isobutyl-4-ethoxy-benzene defined according to the structure:



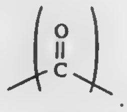
wherein Y is a moiety selected from the group consisting of:

$-[CH_2]-$;



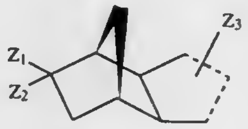
$-\left[\begin{matrix}OH\\|\\C\\|\\H\end{matrix}\right]-$;

and

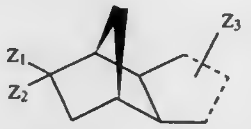


$\left[\begin{matrix}O\\\|\\C\end{matrix}\right]$.

5. A mixture of at least 1-oxo-substituted or unsubstituted isobutyl-4-ethoxy-benzene defined according to claim 1 and at least one bicyclopentadiene derivative defined according to the structure:



wherein in the structure:



in each of the compounds therein, one of the dashed lines represents a carbon-carbon double bond and the other of the dashed lines represents a carbon-carbon single bond; and wherein, Z_1 and Z_2 each represents the same or different hydrogen, C_1–C_3 lower alkyl or C_2–C_3 acyl and Z_3 represents methyl or hydrogen with the proviso that Z_1 and Z_2 are not both hydrogen.

13. A process for imparting, augmenting or enhancing the aroma of a consumable material or to a consumable material selected from the group consisting of perfume compositions, perfumed articles and perfumed polymers comprising the step of intimately admixing with said consumable material an aroma imparting, aug-

menting or enhancing quantity of at least ethoxy benzene derivative defined according to claim 5.

5,462,924

PRODUCT CONTAINING GROWTH FACTOR AND GLUTAMINE AND USE OF GROWTH FACTOR FOR THE TREATMENT OF INTESTINAL MUCOSA

Reinhold Kihlberg, Österskär; Svante B. Lindgren, Märsta, and Lars G. Sandberg, Rimbo, all of, Sweden, assignors to Pharmacia Aktiebolag, Sweden

PCT No. PCT/SE91/00558, § 371 Date Feb. 23, 1993, § 102(e) Date Feb. 23, 1993, PCT Pub. No. WO92/03155, PCT Pub. Date Mar. 5, 1992

PCT Filed Aug. 22, 1991, Ser. No. 975,558

Claims priority, application Sweden, Aug. 24, 1990, 9002732

Int. Cl.^{6} C07K *5/00;* **A61K** *38/00*

U.S. Cl. 574—12 **15 Claims**

1. Method for the treatment of atrophy of the gut mucosa after intravenous nutrition, which comprises injecting a patient in need thereof with a pharmacologically effective dose of IGF-1.

5,462,925

TRANSFORMING GROWTH FACTOR β2,3

Yasushi Ogawa, Pacifica; David Schmidt, Santa Cruz, and James Dasch, Palo Alto, all of Calif., assignors to Celtrix Pharmaceuticals, Inc., Santa Clara, Calif.

Continuation of Ser. No. 614,306, Nov. 16, 1990, abandoned. This application Nov. 20, 1992, Ser. No. 979,441

Int. Cl.^{6} A61K *37/24;37/36*

U.S. Cl. 514—12 **2 Claims**

1. Substantially pure TGF-β2.3 whose partial sequence is SEQ. ID NO:4; said TGF-β2.3 isolated by:

(a) subjecting a pool of TGF-β peak fractions to reverse phase HPLC; and then

(b) recovering the fraction containing said TGF-β2.3, said fraction migrating between TGF-β1 and TGF-β2.

5,462,926

NEUROMEDIN B RECEPTOR ANTAGONISTS WHICH DEMONSTRATE SELECTIVITY

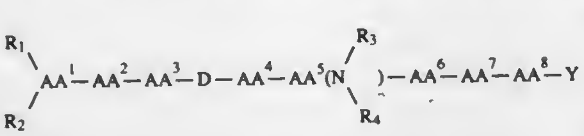
David H. Coy, New Orleans, La., and John E. Taylor, Upton, Mass., assignors to Biomeasure, Inc., Milford, Mass., and Administrators of the Tulane Educational Fund, New Orleans, La.

Continuation-in-part of Ser. No. 919,537, Jul. 27, 1992, abandoned. This application Jun. 17, 1993, Ser. No. 78,419

Int. Cl.^{6} A61K *38/00;* **C07K** *5/00;7/00;17/00*

U.S. Cl. 514—16 **24 Claims**

1. A method of selectively inhibiting inositol phosphate production in cells induced by neuromedin B, said method comprising the step of contacting said cells with an octapeptide of the formula:



$$\overset{R_1}{\underset{R_2}{}}\mathrm{AA}^1-\mathrm{AA}^2-\mathrm{AA}^3-\mathrm{D}-\mathrm{AA}^4-\mathrm{AA}^5(\overset{R_3}{\underset{R_4}{\mathrm{N}}}\quad)-\mathrm{AA}^6-\mathrm{AA}^7-\mathrm{AA}^8-\mathrm{Y}$$

wherein

AA^1 is the D- or L-isomer of an aromatic α-amino acid;

AA^2 is the D- or L-isomer of Cys;

AA^3 is F_5Phe, Phe, or X-Phe in which X is OH;

AA^4 is Trp or an aromatic α-amino acid;

AA^5 is Lys or Orn;

AA^6 is Leu, Ile, Nle, Val, Nal, or Phe;

AA^7 is the D- or L-isomer of Cys;

AA^8 is the D- or L-isomer selected from the group consisting of an aromatic α-amino acid, Thr and Ser;

each R_1 and R_2, independently, is H, C_{1-12} alkyl, C_{2-12} alkenyl, C_{2-12} alkynyl, phenyl, naphthyl, C_{7-12} phenylalkyl, C_{8-12} phenylalkenyl, C_{8-12} phenylalkynyl, C_{11-20} naphthylalkyl, C_{12-20} naphthylalkenyl, C_{12-20} naphthylalkynyl, COE, or COOE in which E is C_{1-12} alkyl, C_{2-12} alkenyl, C_{2-12} alkynyl, phenyl, naphthyl, C_{7-12} phenylalkyl, C_{8-12} phenylalkenyl, C_{8-12} phenylalkynyl, C_{11-20} naphthylalkyl, C_{12-20} naphthylalkenyl, or C_{12-20} naphthylalkynyl, provided that when one of R_1 or R_2 is COE or COOE, the other must be H;

each R_3 and R_4, independently, is H, C_{1-12} alkyl, C_{2-12} alkenyl, C_{2-12} alkynyl, phenyl, naphthyl, C_{7-12} phenylalkyl, C_{8-12} phenylalkenyl, C_{8-12} phenylalkynyl, C_{11-20} naphthylalkyl, C_{12-20} naphthylalkenyl, or C_{12-20} naphthylalkynyl; and

Y is OR_5 or NR_6R_7 in which each R_5, R_6 and R_7, independently, is H, C_{1-12} alkyl, C_{2-12} alkenyl, C_{2-12} alkynyl, phenyl, naphthyl, C_{7-12} phenylalkyl, C_{8-12} phenylalkenyl, C_{8-12} phenylalkynyl, C_{11-20} naphthylalkyl, C_{12-20} naphthylalkenyl, or C_{12-20} naphthylalkynyl;

provided that AA^1 and AA^2 cannot both be D-isomers; and further provided that if AA^8 is Thr or Ser, AA^6 cannot be Val.

5,462,927

PEPTIDES AIDING NERVE REGENERATION

Jacques-Pierre Moreau, Upton, Mass., and David H. Coy, New Orleans, La., assignors to The Administrators of the Tulane Educational Fund, New Orleans, La.

Continuation-in-part of Ser. No. 431,339, Nov. 3, 1989, abandoned, which is a continuation-in-part of Ser. No. 728,847, Apr. 30, 1985, abandoned. This application Dec. 14, 1992, Ser. No. 990,555

Int. Cl.^{6} A61K *38/00;* **C07K** *7/00;7/06;14/68*

U.S. Cl. 514—17 **12 Claims**

1. A peptide of the formula:

$$A^1—A^2—A^3—A^4—\mathrm{Phe}—\mathrm{Arg}—\mathrm{Trp}—A^5$$

wherein A^1 is H or acetyl;

A^2 is D—Ala;

A^3 is Glu or Gln; and

A^4 is His or Tyr;

A^5 is Gly—NH_2; or a pharmaceutically acceptable salt thereof.

5,462,928

INHIBITORS OF DIPEPTIDYL-AMINOPEPTIDASE TYPE IV

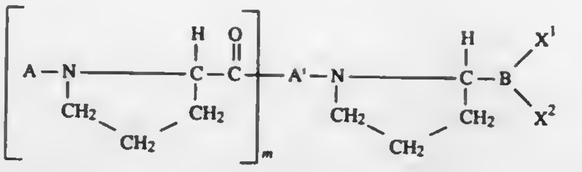
William W. Bachovchin, Melrose; Andrew G. Plaut, and Flentke George R., both of Boston, all of Mass., assignors to New England Medical Center Hospitals, Inc., Boston, and Tufts University, Medford, both of Mass.

Continuation of Ser. No. 781,552, Oct. 22, 1991, abandoned, which is a continuation-in-part of Ser. No. 510,274, Apr. 14, 1990, abandoned. This application Jul. 15, 1993, Ser. No. 93,302

Int. Cl.^{6} A61K *38/00;31/675;* **A01N** *57/00;65/00*

U.S. Cl. 514—19 **13 Claims**

1. A method for treating transplant rejection in a patient comprising administering to said patient an inhibitor of DP-IV, having the structure:



wherein m is an integer between 0 and 10, inclusive; A and A' are amino acid residues such that the A in each repeating bracketed unit can be a different amino acid residue; the bonds between A and N, A' and C, and between A' and N are peptide bonds; and each X^1 and X^2 is, independently, a hydroxyl group or a group capable of being hydrolysed to a hydroxyl group at physiological pH.

5,462,929

TREATMENT OF PSORIASIS BY ADMINISTRATION OF 4-CARBAMOYL-1-β-D-RIBOFURANOSYLIMIDSZOLIUM-5-OLEATE

Makoto Kawashima, Tokyo; Kazuhiro Nagano; Kazuyoshi Hori, both of Hori; Hiroaki Ishikawa, Kanagawa, and Masataka Morishita, Shizuoka, all of, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

PCT No. PCT/JP92/00985, § 371 Date Apr. 11, 1994, § 102(e) Date Apr. 11, 1994, PCT Pub. No. WO93/02683, PCT Pub. Date Feb. 18, 1993

PCT Filed Aug. 3, 1992, Ser. No. 190,165

Claims priority, application Japan, Aug. 6, 1991, 3-219301; Jul. 16, 1992, 4-212188

Int. Cl.^{6} A61K *31/70*

U.S. Cl. 514—43 **2 Claims**

1. A method of treating psoriasis which comprises administering to a patient afflicted with psoriasis an amount of 4-carbamoyl-1-β-D-ribofuranosyl-imidazolium-5-olate, said amount being effective to ameliorate symptoms of psoriasis.

5,462,930

Patent Not Issued For This Number

5,462,931

FUNGICIDAL 2-HETEROCYCLIC-2,2-DISUBSTITUTED-ETHYL 1,2,4-TRIAZOLES

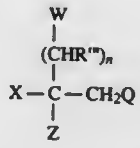
Steven H. Shaber, Horsham, Pa., and Luong T. Nguyen, Singapore, Singapore, assignors to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 904,230, Jun. 25, 1992, Pat. No. 5,358,939. This application Jun. 30, 1994, Ser. No. 269,874

Int. Cl.^{6} A01N *43/64;* **C07D** *249/14;239/02;249/08;241/02*

U.S. Cl. 514—63 **6 Claims**

1. A compound of the formula:



$$X-\overset{\overset{\displaystyle W}{|}}{\overset{(CHR''')_n}{\overset{|}{C}}}-CH_2Q \quad \text{with } Z \text{ below } C$$

wherein

X is a six membered heterocyclic ring having up to three atoms selected independently from nitrogen, oxygen and sulfur, all members of the ring unsubstituted or substituted with one or two substituents independently selected from (C_1-C_{12})alkyl and halo;

Q is 1-(1,2,4-triazolyl) or 4-(1,2,4-triazolyl) or either of said triazolyls substituted with one or two substituents selected from halo, (C_1-C_4)alkyl, nitro, cyano, mercapto and (C_1-C_5)alkylmercapto;

Z is (C_1-C_{12})alkyl, halo(C_1-C_{12})alkyl, (C_2-C_8)alkenyl, halo(C_2-C_8)alkenyl, (C_2-C_8)alkynyl, (C_5-C_8)cycloalkenyl, (C_1-C_{12})alkylaryl, (C_6-C_{10})aryl, or (C_6-C_{10})aryl substituted with one, two or three substituents selected from the group consisting of hydroxy, halo, acetoxy, trihalomethyl, (C_1-C_4)alkyl, (C_1-C_4)alkoxy; (C_1-C_4)alkylthio, (C_1-C_4)alkylsulfinyl, (C_1-C_4)alkylsufonyl, (C_1-C_4)alkoxy (C_{1-C4})alkoxy, (C_1-C_4)alkyl carbonyl, (C_2-C_8)alkenyl, (C_2-C_4)alkenyloxy, (C_2-C_8)alkynyl, (C_2-C_4)alkynyloxy, phenyl phenyl substituted monosubstituted with halo, (C_1-C_4)alkyl or (C_1-C_4)alkoxy, phenoxy and phenoxy monosubstituted with halo, (C_1-C_4)alkyl or (C_1-C_4)alkoxy, (C_6-C_{10})aryl (C_1-C_{12})alkyl;

W is —OR, —OCOR", —OCOY, —OCOR'Y, —OCOR'OR", —OR'OCOR", —OR'OR, —NH2, —NHCOR, —NHCOR'Y, —NHCOY, —OCONHY, —OSO_2A, —$OSiA_3$, —$OPO(OA)_2$ or halo wherein A is (C_1-C_6)alkyl;

R is (C_1-C_{12})alkyl, X,Y-(C_1-C_{12})alkyl, (C_3-C_8)alkenyl, (C_3-C_8)alkynyl, (C_3-C_8)cycloalkyl, cyano (C_1-C_{12})alkyl or epoxy (C_1-C_{12})alkyl, all halogenated or unhalogenated, or is hydrogen, provided that when Z is methyl, R is not haloalkyl;

R' is $(—CH(CH_3)—)p(—CH_2—)m$ or $(—CH_2—)sCH{=}CH(—CH_2—)t$;

m is an integer from 0 to 6;

p is 0 or 1, provided m and p are not both 0;

s and t are each independently integers of from 0 to 3;

R" is phenyl, (C_1-C_6)alkyl, (C_2-C_4)alkenyl or (C_1-C_2)-trialkylsilyl(C_1-C_4)alkyl, all unsubstituted or substituted with 1, 2 or 3 halogens or is hydrogen;

R''' is hydrogen or (C_1-C_6)alkyl;

n is an integer from 1 to 6; and

Y is phenyl, naphthyl, thienyl, furyl or cycloalkyl, or the agronomically acceptable enantiomers, salt complexes or metal complexes thereof.

5,462,932

ORAL LIQUID ALENDRONATE FORMULATIONS

Gerald S. Brenner; Ashok V. Katdare, both of Norristown, Pa.; Denise Pretzer, Chesterfield, Mo., and Donna T. Whiteford, Brooklyn, N.Y., assignors to Merck & Co., Inc., Rahway, N.J.

Filed May 17, 1994, Ser. No. 245,289

Int. Cl.^{6} A61K *31/66;31/685*

U.S. Cl. 514—108 **25 Claims**

1. A pharmaceutical composition comprising a pharmaceutically effective amount of alendronate, in a pharmaceutically acceptable carrier and a sufficient amount of a buffer to maintain a pH of the composition in the range of 2 to 8 and complexing agent to prevent the precipitation of alendronate in aqueous solution.

5,462,933
MODIFIED BILE ACID CONJUGATES, AND THEIR USE AS PHARMACEUTICALS

Werner Kramer, Mainz, and Günther Wess, Erlensee, both of, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Continuation of Ser. No. 806,799, Dec. 12, 1991, abandoned, which is a continuation of Ser. No. 581,390, Sep. 12, 1990, abandoned. This application Mar. 10, 1994, Ser. No. 208,192

Claims priority, application Germany, Sep. 14, 1989, 39 30 696.8

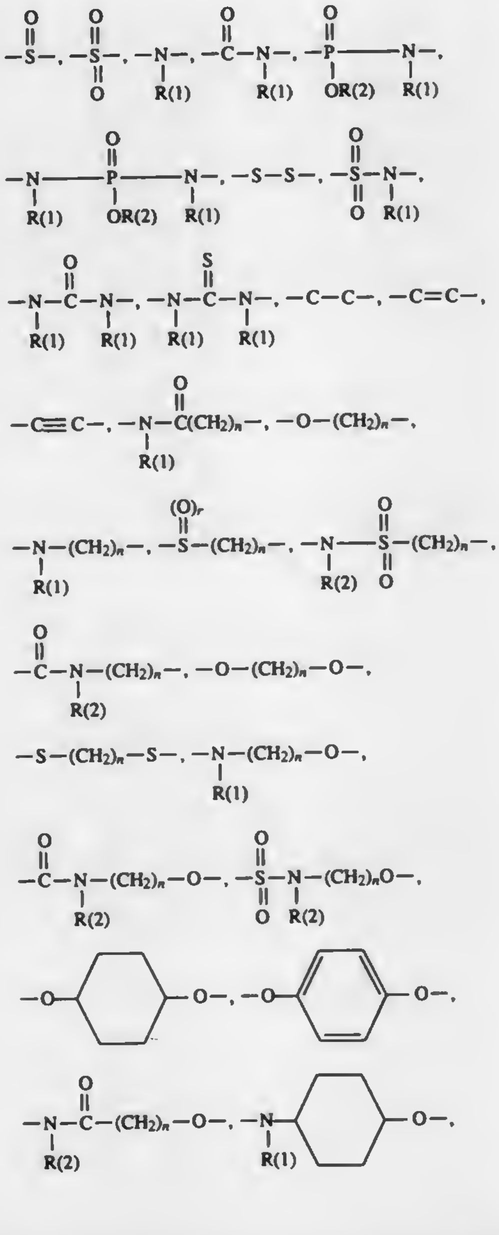
Int. Cl.^{6} A61K *31/58;* C07J *43/00*

U.S. Cl. 514—176 5 Claims

1. A bile acid conjugate compound of the formula I

W—X—G I

consisting of a modified bile acid G—X—, wherein G is a bile acid radical in the form of the free acid, an ester or amide or a salt or a form derivatized on the alcohol groups, and X is a connecting member selected from the following groups



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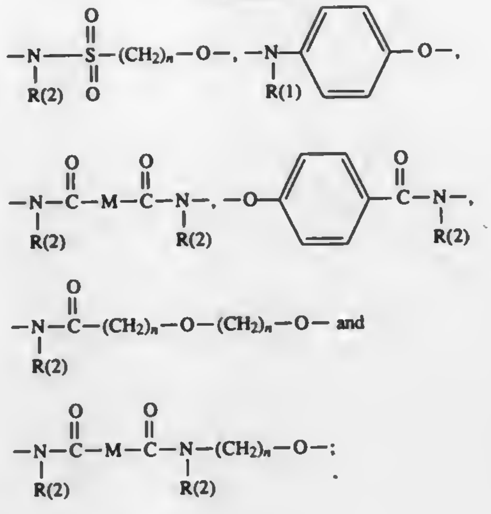
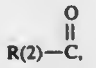


in which

R(1)=H, (C_1–C_8)-alkyl, the group



$R(2)—\overset{O}{\overset{\|}{C}},$

a phenyl radical which is unsubstituted or monosubstituted to trisubstituted by F, CL, Br, (C_1–C_4)-alkyl or (C_1–C_4)-alkoxy, or a benzyl radical which is unsubstituted or monosubstituted to trisubstituted by F, Cl, Br, (C_1–C_4)-alkyl or (C_1–C_4)-alkoxy,

R(2)=H, (C_1–C_8)-alkyl, a phenyl radical which is unsubstituted or monosubstituted to trisubstituted by F, Cl, Br, (C_1–C_4)-alkyl or (C_1–C_4)-alkoxy, or a benzyl radical which is unsubstituted or monosubstituted to trisubstituted by F, Cl, Br, (C_1–C_4)-alkyl or (C_1–C_4)-alkoxy,

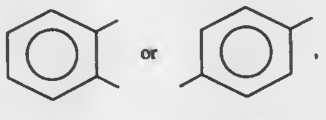
m=0–6,

n=1–16,

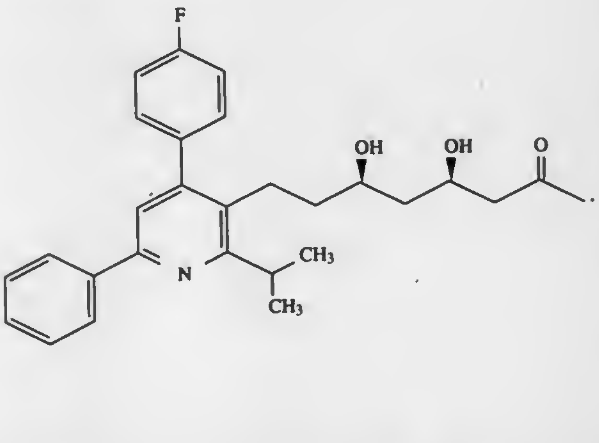
p=1, 2 or 3,

r=0–2and

M=—$(CH_2)_m$—, —$(HC{=}CH)_p$—, —C≡C—,



and an active compound moiety W which is



5. A method for the enhancement of absorption of a pharmaceutically active radical W, as defined in claim 1, by organs connected to the enterohepatic system which comprises administering to a patient in need of such enhancement an effective amount of a compound 1 as claimed in claim 1.

5,462,934

CONDENSED HETEROCYCLIC KETONE DERIVATIVES AND THEIR USE

Giichi Goto, Osaka; Masaomi Miyamoto, and Yuji Ishihara, both of Hyogo, all of, Japan, assignors to Takeda Chemical Industries, Osaka, Japan

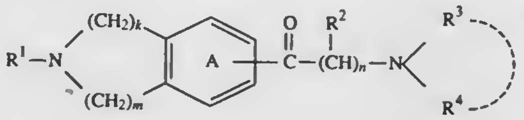
Filed Mar. 4, 1993, Ser. No. 26,041

Claims priority, application Japan, Mar. 9, 1992, 4-050960; Apr. 17, 1992, 4-097848; Jun. 5, 1992, 4-145852; Aug. 6, 1992, 4-210225; Sep. 29, 1992, 4-259606

Int. Cl.^{6} A61K *31/55;* **C07D** *223/16;401/10;403/10*

U.S. Cl. 514—183 **27 Claims**

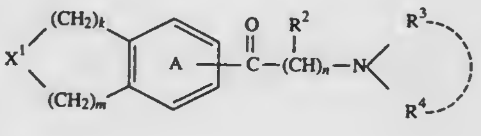
1. A compound of the formula:



[1]

wherein R^1 is H, an optionally substituted hydrocarbon group or an optionally substituted acyl group; ring A is an optionally further substituted benzene ring; n is a whole number of 1 to 10; R^2, is H or an optionally substituted hydrocarbon group; R^3 and R^4 form an optionally substituted heterocyclic group, taken together with the adjacent nitrogen atom; R^2's may be different from one another in the repetition of n; k is a whole number of 0 to 3; and m is a whole number of 1 to 8; provided that when k=0 and m=2, n is a whole number of not less than 2, and provided that k+m=2 to 5; or a pharmaceutically acceptable salt thereof.

27. A method of treating a disease caused by acetylcholinesterase activity which comprises administering a therapeutically effective amount of a compound of the formula:



[VII]

wherein X^1 is R^1—N (R^1 is H, an optionally substituted hydrocarbon group or an optionally substituted acyl group); ring A is an optionally further substituted benzene ring; n is a whole number of 1 to 10; R^2, R^3 and R^4 are independently H or an optionally substituted hydrocarbon group; R^3 and R^4 may form an optionally substituted heterocyclic group, taken together with the adjacent nitrogen atom; R^2's may be different from one another in the repetition of n; k is a whole number of 0 to 3; and m is a whole number of 1 to 8, and provided that k+m=2 to 5; or a pharmaceutically acceptable salt thereof, together with a pharmaceutically acceptable carrier to a mammal suffering from such disease.

5,462,935

CEPHALOSPORIN COMPOUNDS

Yong Z. Kim; Hun S. Oh; Jae H. Yeo; Jong C. Lim; Chan S. Bang; Won S. Kim, and Hyeon J. Yim, all of Daejeon, Rep. of Korea, assignors to Lucky Limited, Yongdungpo, Rep. of Korea

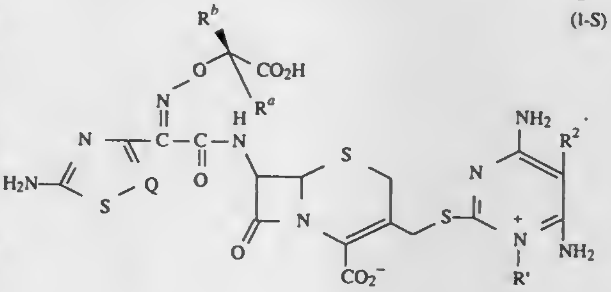
Filed Feb. 10, 1993, Ser. No. 971,986

Claims priority, application Rep. of Korea, Aug. 17, 1990, 90-12892

Int. Cl.^{6} C07D *50/36;* **A61K** *31/545*

U.S. Cl. 514—206 **11 Claims**

1. A cephalosporin compound represented by formula (1-S)



(1-S)

and the pharmaceutically acceptable non-toxic salts, physiologically hydrolyzable esters, hydrates and solvates thereof, wherein:

R^1 is a C_{1-4} alkyl, C_{3-4} alkenyl, C_{3-4} cycloalkyl, amino optionally substituted with a C_{1-4} alkyl radical, phenyl, or 2-, 4- or 6- substituted phenyl group with two or fewer substituents chosen from C_{1-4} alkyl, C_{1-3} alkoxy, halogen and hydroxy radicals;

R^2 is hydrogen or a C_{1-4} alkyl group;

R^a and R^b, which should be different from each other, are hydrogen or a C_{1-4} alkyl group; and

Q is N or CH.

5,462,936

BENZOTHIAZEPINE DERIVATIVES

Teruo Yamamori, Takarazuka; Hiroshi Harada, Toyonaka; Katsunori Sakai, Osaka; Kazumi Iwaki, Higashiosaka, and Kazuki Matsunaga, Suita, all of, Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Division of Ser. No. 960,851, Oct. 14, 1992, Pat. No. 5,378,698. This application Aug. 22, 1994, Ser. No. 292,226

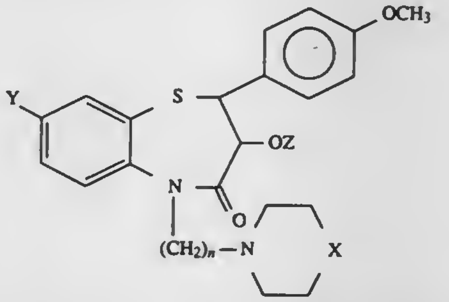
Claims priority, application Japan, Jan. 21, 1991, 3-302348

The portion of the term of this patent subsequent to Jan. 3, 1995, has been disclaimed.

Int. Cl.^{6} A61K *31/55;* **C07D** *417/06*

U.S. Cl. 514—211 **9 Claims**

1. A compound of the formula



(I)

wherein X is $=NR^1$; R^1 is optionally substituted benzhydryl; Y is hydrogen, halogen, C_{1-6} alkyl or C_{1-6} alkoxy; Z is hydrogen or acetyl; n is an integer of from 3 to 6, or a pharmaceutically acceptable salt thereof.

5,462,937

METHODS FOR INHIBITING VASCULAR SMOOTH MUSCLE CELL PROLIFERATION AND RESTINOSIS

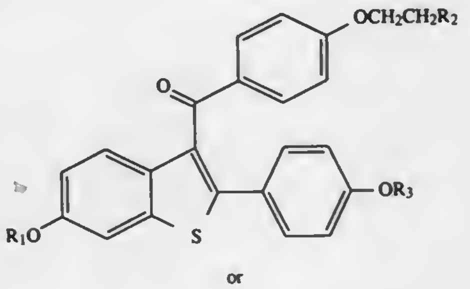
George J. Cullinan, Trafalgar; Jai P. Singh, Carmel, and Dan L. Wood, Indianapolis, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 138,296, Oct. 15, 1993. This application Apr. 14, 1995, Ser. No. 422,286

Int. Cl.^{6} A61K *31/55*

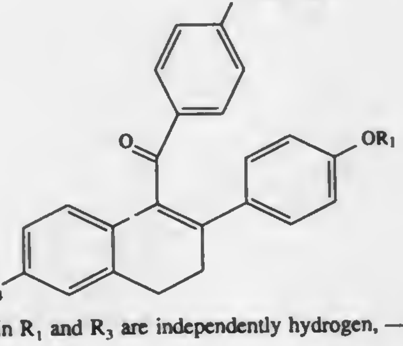
U.S. Cl. 514—212 **6 Claims**

1. A method of inhibiting vascular smooth muscle cell proliferation comprising administering to a human or other mammal in need of treatment an effective amount of a compound having the formula



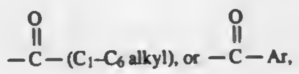
(I)

or



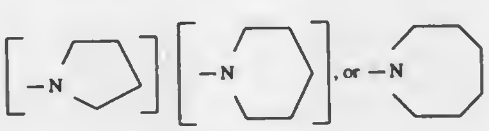
(II)

wherein R_1 and R_3 are independently hydrogen, $-CH_3$,



$$-\overset{O}{\overset{\|}{C}}-(C_1\text{–}C_6\text{ alkyl}),\text{ or }-\overset{O}{\overset{\|}{C}}-Ar,$$

wherein Ar is optionally substituted phenyl; R_2 is



and

R_4 is hydrogen or $-OR_1$, and pharmaceutically acceptable salts and solvates thereof.

5,462,938

ARTHROPODICIDAL OXADIAZINYL, THIADIAZINYL AND TRIAZINYL CARBOXANILIDES

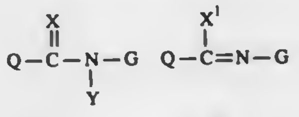
Gary D. Annus, 13 Franklin Rd., Landenberg, Pa. 19350; William E. Barnette, 107 Oxford Rd., West Chester, Pa. 19380; Stephen F. McCann, 11 Old Stable Farm, Newark, Del. 19711, and Keith D. Wing, 1304 Hillside Blvd., Wilmington, Del. 19803

Continuation of Ser. No. 714,401, Jun. 11, 1991, abandoned, which is a continuation of Ser. No. 632,438, Dec. 21, 1990, abandoned. This application Jun. 18, 1993, Ser. No. 75,534

Int. Cl.^{6} A61K *31/535;* **C07D** *273/04*

U.S. Cl. 514—229.8 **16 Claims**

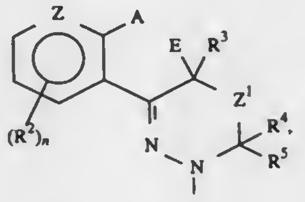
1. A compound of Formula I or II:



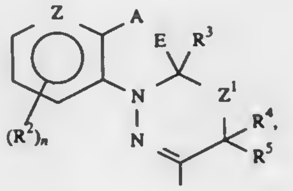
I II

wherein:

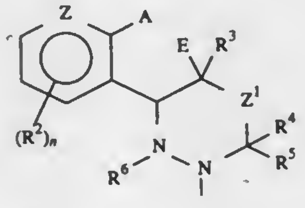
Q is selected from the group



Q-1

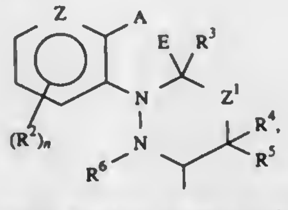


Q-2



Q-3

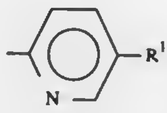
and



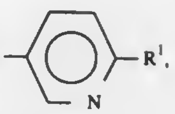
Q-4

A and E are taken together to form $-CH_2-$, $-CH_2CH_2-$, substituted $-CH_2-$, and substituted $-CH_2CH_2-$ the substituents independently selected from 1–2 halogen and 1–2 methyl;

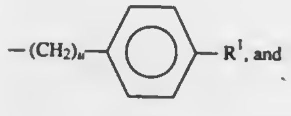
G is selected from the group



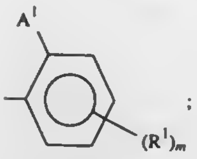
G-1



G-2



G-6



G-9

X is selected from the group O, S and N—X^2;

X^1 is selected from the group Cl, Br, OR^8, SR^8 and NR^8R^9;

X^2 is selected from the group R^8, OH, OR^8, CN, SO_2R^8, SO_2Ph, $OC(O)NR^9R^{10}$, $OC(O)OR^8$, NR^9R^{10} and phenyl optionally substituted with R^{11};

Y is selected from the group H; C_1–C_6 alkyl; benzyl; C_2–C_6 alkoxyalkyl; C_2–C_6 alkenyl; C_2–C_6 alkynyl; C_1–C_6 alkyl optionally substituted by halogen, C_1–C_3 alkoxy, C_1–C_3 haloalkoxy, CN, NO_2, $S(O)_rR^{32}$, COR^{32}, CO_2R^{32}, phenyl optionally substituted by halogen, CN, C_1–C_2 haloalkyl and C_1–C_2 haloalkoxy; C_3–C_6 cycloalkyl; C_3–C_6 cyclohaloalkyl; C_3–C_6 cycloalkylalkyl; CHO; C_2–C_6 alkylcarbonyl; C_2–C_6 alkoxycarbonyl; C_2–C_6 haloalkylcarbonyl; COR^{36}; CO_2R^{36}; C_1–C_6 alkylthio; C_1–C_6 haloalkylthio; phenylthio; $R^{12}OC(O)N(R^{13})S$— and $R^{14}(R^{15})NS$—;

A^1 is H;

A^1 and Y can be taken together to form $-(CH_2)_t-$;

Z is C;

Z^1 is O;

R^1 and R^2 are independently selected from the group H, C_1–C_6 alkyl, C_1–C_6 haloalkyl, C_2–C_6 alkenyl, C_2–C_6 haloalkenyl, C_2–C_6 alkynyl, C_3–C_6 haloalkynyl, C_2–C_6 alkoxyalkyl, C_2–C_6 alkylthioalkyl, C_1–C_6 nitroalkyl, C_2–C_6 cyanoalkyl, C_3–C_8 alkoxycarbonylalkyl, C_3–C_6 cycloalkyl, C_3–C_6 halocycloalkyl, halogen, CN, N_3, SCN, NO_2, OR^{17}, SR^{17}, $S(O)R^{17}$, $S(O)_2R^{17}$, $OC(O)R^{17}$, $OS(O)_2R^{17}$, CO_2R^{17}, $C(O)R^{17}$, $C(O)NR^{17}R^{18}$, $SO_2NR^{17}R^{18}$, $NR^{17}R^{18}$, $NR^{18}C(O)R^{17}$, $OC(O)NHR^{17}$, $NR^{18}C(O)NHR^{17}$, $NR^{18}SO_2R^{17}$, phenyl optionally substituted with 1 to 3 substituents independently selected from W, and benzyl optionally substituted with 1 to 3 substituents independently selected from W; or when m or n is 2, $(R^1)_2$ can be taken together, or $(R^2)_2$ can be taken together as $-OCH_2O-$, $-OCF_2O-$, $-OCH_2CH_2O-$, $-CH_2C(CH_3)_2O-$, $-CF_2CF_2O$ or $-OCF_2CF_2O-$ to form a cyclic bridge; provided that when R^1 or R^2 is $S(O)R^{17}$, $S(O)_2R^{17}$, $OC(O)R^{17}$ or $OS(O)_2R^{17}$ then R^{17} is other than H;

R^3 is selected from the group H, halogen, $N(R^{22})R^{23}$, C_1–C_6 alkyl, C_1–C_6 haloalkyl, C_2–C_6 alkenyl, C_2–C_6 haloalkenyl, C_2–C_6 alkynyl, C_2–C_6 alkoxylalkyl, CO_2R^{17}, $C(O)R^{17}$, $C(O)NR^{17}R^{18}$, phenyl, phenyl substituted with 1 to 3 substituents independently selected from halogen, C_1–C_6 haloalkyl, C_2–C_6 alkenyl, C_2–C_6 haloalkenyl, C_2–C_6 alkynyl, C_3–C_6 haloalkynyl, C_3–C_6 cycloalkyl, C_3–C_6 halocycloalkyl, CN, SCN, NO_2, OR^{17}, SR^{17}, CO_2R^{17}, $C(O)R^{17}$, $C(O)NR^{17}R^{18}$ and $SO_2NR^{17}R^{18}$ benzyl and benzyl substituted with 1 to 3 substituents independently selected from halogen;

R^4 and R^5 are independently selected from the group H, C_1–C_4 alkyl, COR^{20} and C_2–C_4 alkoxycarbonyl; or R^4 and R^5 can be taken together to form =O or =S;

R^6 is selected from the group H, C_1–C_4 alkyl, C_1–C_4 haloalkyl, C_2–C_4 alkylcarbonyl, C_2–C_4 haloalkoxycarbonyl, C_2–C_4 alkoxycarbonyl C_2–C_4 haloalkoxycarbonyl, COR^{36}, CO_2R^{36}, C_2–C_5 alkylaminocarbonyl, C_3–C_6 cycloalkyl, C_3–C_6 halocycloalkyl, C_4–C_7 alkylcycloalkyl, C_4–C_7 haloalkylcycloalkyl, C_1–C_4 alkylsulfonyl, C_1–C_4 haloalkylsulfonyl and SO_2Ph optionally substituted with Cl, Br or CH_3;

R^8 is selected from the group C_1–C_3 alkyl, C_2–C_4 alkenyl, C_2–C_4 alkynyl, C_1–C_3 haloalkyl; C_2–C_4 haloalkenyl, C_3–C_6 cycloalkyl; C_1–C_3 alkyl substituted with OCH_3, OCH_2CH_3, NO_2, CN, CO_2CH_3, $CO_2CH_2CH_3$, SCH_3 or SCH_2CH_3 and benzyl optionally substituted with R^{11};

R^9 is selected from the group H, C_1–C_4 alkyl C_1–C_4 haloalkyl, C_2–C_4 alkoxycarbonyl, and optionally substituted phenyl and pyridine wherein the substituent(s) are selected from R^{15}; or

R^8 and R^9 can be taken together to form $-(CH_2)_4-$, $-(CH_2)_5-$ or $-CH_2CH_2OCH_2CH_2-$ each of which is optionally and independently substituted with 1 or 2 CH_3 groups;

R^{10} is selected from the group H and C_1–C_4 alkyl; or

R^9 and R^{10} can be taken together to form $-(CH_2)_4-$, $-(CH_2)_5-$ or $-CH_2CH_2OCH_2CH_2-$ each of which is optionally and independently substituted with 1 or 2 CH_3 groups;

R^{11} is selected from halogen, CN, C_1–C_3 haloalkyl and C_1–C_3 haloalkoxy;

R^{12} is C_1–C_6 alkyl;

R^{13} is C_1–C_4 alkyl;

R^{14} and R^{15} are independently C_1–C_4 alkyl; or

R^{14} and R^{15} can be taken together as $-CH_2CH_2CH_2CH_2CH_2-$ or $-CH_2CH_2OCH_2CH_2-$;

R^{17} is selected from the group H, C_1–C_6 alkyl, C_1–C_6 haloalkyl, C_2–C_6 alkenyl, C_2–C_6 haloalkenyl, C_2–C_6 alkynyl, C_3–C_6 haloalkynyl, C_2–C_6 alkoxyalkyl, C_2–C_6 alkylthioalkyl, C_1–C_6 nitroalkyl, C_2–C_6 cyanoalkyl, C_3–C_8 alkoxycarbonylalkyl, C_3–C_6 cycloalkyl, C_3–C_6 halocycloalkyl, and optionally substituted phenyl and benzyl wherein the substituents are 1 to 3 substituents independently selected from W;

R^{18} is selected from the group H and C_1–C_4 alkyl; or

R^{17} and R^{18}, when attached to the same atom, can be taken together as $-(CH_2)_4-$, $-(CH_2)_5-$, or $-CH_2CH_2OCH_2CH_2-$;

R^{20} is C_1–C_3 alkyl;

R^{22} is selected from the group H, C_2–C_7 alkylcarbonyl, C_2–C_7 alkoxycarbonyl, optionally substituted C_1–C_4 alkyl, optionally substituted C_2–C_4 alkenyl, and optionally substituted C_2–C_4 alkynyl, the substituents selected from C_1–C_2 alkoxy, CN, $C(O)R^{30}$ and $C(O)_2R^{27}$;

R^{23} is selected from the group H, C_1–C_3 alkyl, phenyl, phenyl substituted with W, benzyl and benzyl substituted with W;

R^{27} is selected from the group C_1–C_3 alkyl, phenyl and phenyl substituted with W;

R^{30} is selected from the group H, C_1–C_3 alkyl, phenyl and phenyl substituted by W;

R^{32} is selected from the group C_1–C_3 alkyl;

R^{36} is selected from the group phenyl and phenyl substituted by W;

W is selected from the group halogen, CN, NO_2, C_1–C_2 alkyl, C_1–C_2 haloalkyl, C_1–C_2 alkoxy, C_1–C_2 haloalkoxy, C_1–C_2 alkylthio, C_1–C_2 haloalkylthio, C_1–C_2 alkylsulfonyl and C_1–C_2 haloalkylsulfonyl;

m is 1 to 3;

n is 1 to 3;

r is 0, 1 or 2;

t is 2 or 3; and

u is 1 or 2.

5,462,939

PEPTIDIC KETONES AS INTERLEUKIN-1β-CONVERTING ENZYME INHIBITORS

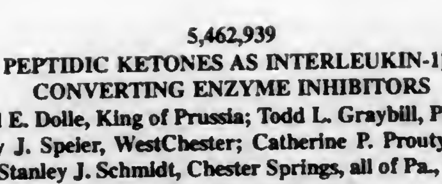
Roland E. Dolle, King of Prussia; Todd L. Graybill, Pottstown; Gary J. Speier, WestChester; Catherine P. Prouty, Wayne, and Stanley J. Schmidt, Chester Springs, all of Pa., assignors to Sterling Winthrop Inc., New York, N.Y.

Filed May 7, 1993, Ser. No. 60,197

Int. Cl.^{6} A61K *31/535;37/00;* **C07D** *409/00*

U.S. Cl. 514—231.5 **15 Claims**

1. A compound of the formula (I) or a pharmaceutically acceptable salt thereof:



(I)

wherein

R_1 is $(CR_5R_6)_n$, $(CR_5R_6)_n$-aryl, $(CR_5R_6)_n$-heteroaryl, X-$(CR_5R_6)_n$, X-$(CR_5R_6)_n$-aryl or X-$(CR_5R_6)_n$-heteroaryl wherein aryl and heteroaryl may be optionally substituted;

X is O or NR_5;

R_5 and R_6 are independently H or lower alkyl;

R_2 is H, halo, lower alkyl or $(CR_5R_6)_n$-aryl;

R_3 and R_4 are independently H or alkyl;

A is a D or L isomer of an amino acid selected from the group consisting of alanine, valine, leucine, isoleucine, proline, phenylalanine, glycine, tyrosine, methionine, asparagine, glutamine, aspartic acid, glutamic acid, lysine, arginine, histidine and β-thienylalanine;

Z is CH_2 or O; and

n is 0–4.

5,462,940

4-OXOCYCLIC UREAS USEFUL AS ANTIARRHYTHMIC AND ANTIFIBRILLATORY AGENTS

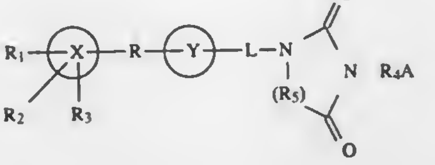
Chia-Nien Yu; Stanford S. Pelosi, Jr., both of Norwich, and Mark A. Calcagno, Oxford, all of N.Y., assignors to Norwich Eaton Pharmaceuticals, Inc., Norwich, N.Y.

Continuation of Ser. No. 59,862, May 10, 1993, abandoned, which is a continuation of Ser. No. 744,867, Aug. 14, 1991, abandoned. This application Jun. 3, 1994, Ser. No. 275,461

Int. Cl.^{6} A61K *31/535;31/495;31/55;* **C07D** *413/00;403/00;401/00;421/00;241/02*

U.S. Cl. 514—235.8 **35 Claims**

1. A novel 4-oxocyclic urea compound having the general structure:



wherein

a) X is a saturated or unsaturated, substituted or unsubstituted, 5-, 6-, or 7-membered heterocycle or 5-, 6-, 7-membered carbocycle; wherein, when X is a heterocycle, said heterocycle has one or two heteroatoms, independently selected from the group consisting of O and N; and wherein when heterocycle X or carbocycle X is substituted, said substituents are R_1, R_2, and R_3;

b) R is selected from the group consisting of covalent bond; nil; heteroatom; carboxyl; saturated or unsaturated, substituted or unsubstituted 5-, 6-, or 7-membered heterocycle having one or two heteroatoms, independently selected from the group consisting of O and N; saturated or unsaturated, substituted or unsubstituted 5-, 6-, or 7-membered carbocycle; alkyl; alkenyl; alkoxy; alkylamino; arylalkyl; aryloxy; acyl; acyloxy, and acylamino; wherein when said heterocycle or said carbocycle is substituted, said substitutents are selected from the group consisting of H, Cl, F, Br, NH_2, CF_3, OH, SO_3H, CH_3SO_2NH, COOH, alkoxy, alkoxycarbonyl, alkyl hydroxyalkyl, carboxyalkyl, aminoalkyl, acylamino, and acyloxy;

c) Y is a substituted or unsubstituted, saturated or unsaturated 5-, 6-, or 7-membered heterocycle having one or two heteroatoms, independently selected from the group consisting of O and N; a substituted or unsubstituted, saturated or unsaturated 5-, 6-, or 7-membered carbocycle; or is nil; wherein when said heterocycle or said carbocycle is substituted, said substitutents are selected from the group consisting of H, Cl, F, Br, NH_2, CF_3, OH, SO_3H, CH_3SO_2NH, COOH, alkoxy, alkoxycarbonyl, aminoalkyl, acylamino, and acyloxy;

and wherein when Y and R are nil, X is a carbocycle or heterocycle; and wherein when R is nil, X and Y are rings, independently selected from carbocycles and heterocycles, which are fused; and wherein when R is a covalent bond, X and Y are unfused rings, independently selected from carbocycles and heterocycles, linked together through covalent bond R; and wherein when Y is nil, R is a covalent bond and X is a carbocycle or heterocycle, then X is bound to L through R;

d) R_1, R_2, and R_3 are substituents on the X moiety and are independently selected from the group consisting of H, Cl, F, Br, NH_2, CF_3, OH, SO_3H, CH_3SO_2NH, COOH, alkoxy, alkoxycarbonyl, alkyl hydroxyalkyl, carboxyalkyl, aminoalkyl, acylamino, and acyloxy;

e) L is a linking moiety and is selected from the group consisting of alkylamino, alkenylamino, alkylimino, alkyenylimino, and acylamino; wherein the carbon-containing end of L is bound to the X-Y-R ring system at Y; but if Y is nil, through R, at X; and wherein the nitrogen atom of L is bound to the nitrogen atom at the 1-position of the 4-oxocyclic urea ring moiety;

f) R_4 is selected from the group consisting of an alkyl, alkenyl, alkynl, alkylacyl, and heteroalkyl;

g) A is a substituted or unsubstituted, saturated or unsaturated, straight-chain or branched C_1–C_8 alkylamino, wherein when said alkylamino is substituted, said substituents are selected from the group consisting of methyl, hydroxyethyl, alkyl, aryl, 5- or 6-membered heterocycle having one or two nitrogen atoms, phenylalkyl, mercaptoethyl, and methansulfonyl; or A is a substituted or unsubstituted, saturated or unsaturated heterocycle having 5-, 6-, or 7-members, and one or two heteroatoms independently selected from the group consisting of O and N; and wherein when heterocycle A is substituted, said substituents are selected from the group hydroxyethyl, alkyl, aryl, mercaptoethyl, methanesulfonyl, 5- or 6-membered heterocycle having one or two nitrogen atoms, and phenylalkyl, and A has one nitrogen atom which is adjacent to R_4; and wherein, when heterocycle A has six members and has one nitrogen atom and A is substituted, said substituents are hydroxyethyl, hydroxy oxo, and methyl; and

h) R^5 is a substituted or unsubstituted C_1 or C_2alkyl.

5,462,941

3,6-DISUBSTITUTED PYRADAZINE DERIVATIVES

Norimichi Iwase, Kanagawa; Yasuhiro Morinaka, Ibaraki; Yoshikuni Tamao, Tokyo; Toshiji Kanayama, and Kumi Yamada, both of Kanagawa, all of, Japan, assignors to Mitsubishi Chemical Corporation, Tokyo, Japan

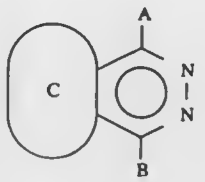
Division of Ser. No. 950,947, Sep. 25, 1992, Pat. No. 5,324,727. This application Mar. 21, 1994, Ser. No. 215,426

Claims priority, application Japan, Sep. 26, 1991, 3-247647; Dec. 18, 1991, 3-335277; Sep. 8, 1992, 4-239545

Int. Cl.^{6} A61K *31/50;* **C07D** *237/34;247/02;409/04*

U.S. Cl. 514—248 **12 Claims**

1. A 3,6-disubstituted pyridazine derivative represented by the following formula (I), an optical antipode thereof or a pharmaceutically acceptable acid-addition salt thereof:

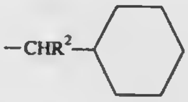


(I)

wherein

A represents a phenyl group, a thienyl group or a furyl group each of which may be substituted by an alkyl group having 1 to 4 carbon atoms;

B represents —NH—D wherein D represents



wherein R^2 represents an alkyl group having 1 to 4 carbon atoms; and

the ring C represents a benzene ring.

5,462,942

2,3-DIHYDRO-1,4-BENZODIOXIN-5-YL-PIPERAZINE DERIVATIVES HAVING 5-HT1A-ANTAGONISTIC ACTIVITY

Jan Hartog; Bartholomeus J. Van Steen; Johannes Mos, and Jacques Schipper, all of Weesp, Netherlands, assignors to Duphar International Research B.V., Weesp, Netherlands

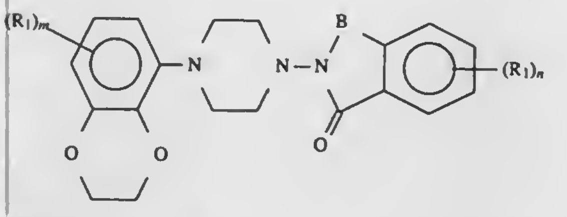
Filed Jun. 30, 1994, Ser. No. 269,086

Claims priority, application European Pat. Off., Jul. 5, 1993, 93201950

Int. Cl.^{6} A61K *31/495;* **C07D** *405/14*

U.S. Cl. 514—254 **3 Claims**

1. A compound of formula 2



(2)

wherein

R_1 is halogen, lower alkyl or alkoxy, hydroxy, trifluoromethyl or cyano,

m has the value 1 or 2 and n has the value 0 or 1,

A represents an alkylene chain containing 2–6 C-atoms which may be substituted with one or more lower alkyl groups or a phenyl group, and

B is methylene, ethylene, carbonyl, sulfinyl, sulfonyl or sulfur or a pharmaceutically acceptable salt thereof.

5,462,943

SUBSTITUTED ACETIC ACID ESTERS USEFUL AS PESTICIDES PER SE AND AS INTERMEDIATES FOR SUBSTITUED ACRYLIC ESTERS PESTICIDES

Thomas Seitz, Monheim; Alexander Klausener, Krefeld; Dieter Berg, Wuppertal; Ulrike Wachendorff-Neumann, Monheim; Christoph Erdelen, Leichlingen; Gerd Hänssler, Leverkusen; Wilhelm Brandes, Leichlingen, and Stefan Dutzmann, Duesseldorf, all of, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

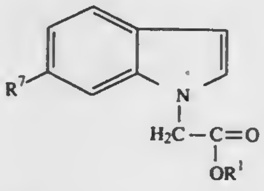
Division of Ser. No. 949,903, Sep. 23, 1992, Pat. No. 5,262,416. This application Jul. 9, 1993, Ser. No. 89,870

Claims priority, application Germany, Jan. 28, 1990, 40 02 466.0

Int. Cl.^{6} A61K *31/505;* **C07D** *403/04;403/10*

U.S. Cl. 514—256 **9 Claims**

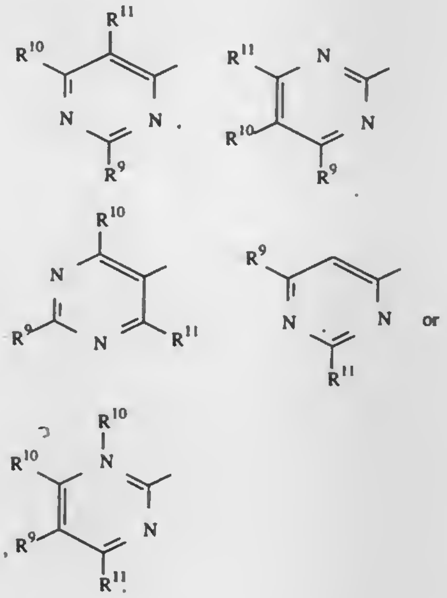
1. A substituted acetic acid ester of the formula



in which

R^1 represents straight-chain or branched alkyl having 1 to 6 carbon atoms,

R^7 represents



in which

R^9, R^{10}, and R^{11} represent phenyl, benzyl, phenoxy, phenylthio, benzyloxy, or benzylthio each of which is optionally substi tuted in the aryl moiety by identical or different substituents selected from the group consisting of fluorine, chlorine, bromine, C_{1-4} alkyl, C_{1-4} alkoxy, C_{1-4} halogenoalkyl, and C_{1-4} halogenoalkoxy.

5,462,944

FUNGICIDAL COMPOSITION AND METHOD OF COMBATING FUNGI

Waldemar F. A. Pfrengle, Seibersbach, Germany, assignor to Shell Research Limited, United Kingdom

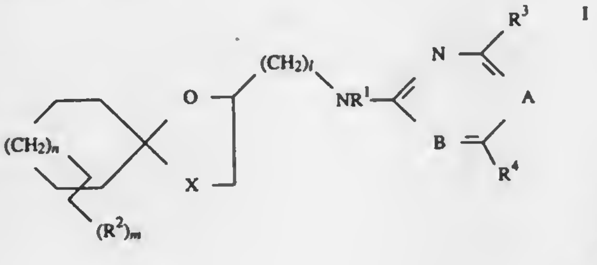
Filed May 2, 1994, Ser. No. 235,936

Claims priority, application European Pat. Off., May 3, 1993, 93107131

Int. Cl.^{6} A61K ***31/505;*** **C07D** ***405/12***

U.S. Cl. 514—275 **16 Claims**

1. A method of combating fungi at a locus which comprises treating the locus with a fungicidally effective amount of a compound of the formula I:



I

or an acid-addition salt thereof
in which

- X represents O or CH_2,
- R^1 represesnts a hydrogen atom or an optionally substituted alkyl, cycloalkyl, haloalkyl, alkenyl, alkynyl, aryl or aralkyl group,
- R^2 represents an optionally substituted alkyl, cycloalkyl, cycloalkylalkyl, alkoxy, alkyoxyalkyl, aryl or aryloxy group, or R^2, together with the ring to which it is attached, represents a polycyclic hydrocarbyl group,
- A represents a group CR^5 and B represents a nitrogen atom,
- R^3, R^4 and R^5 each independently represent a hydrogen or halogen atom, a hydroxy or cyano group or an optionally substituted alkyl, alkenyl, alkynyl, haloalkyl, alkoxyalkyl, aralkyl, aryl, alkylamino, alkylthio or alkoxy group,
- l represents an integer from 1 to 3,
- m represents an integer from 1 to 6, and
- n represents zero or an integer from 1 to 3.

5,462,945

N-SUBSTITUTED TRIFLUOROMETHYLPHENYLTETRAHYDROPYRIDINES, PROCESS FOR THE PREPARATION THEREOF, INTERMEDIATES IN SAID PROCESS AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Umberto Guzzi; Costantino Palmieri, and Tiziano Croci, all of Milan, Italy, assignors to Sanofi, Paris, France

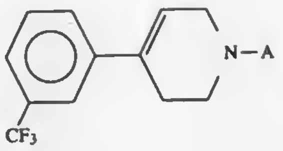
Continuation of Ser. No. 705,704, May 23, 1991, Pat. No. 5,281,606. This application Oct. 26, 1993, Ser. No. 141,066

Claims priority, application France, May 23, 1990, 90 06474

Int. Cl.^{6} A61K ***31/435;*** **C07D** ***211/70***

U.S. Cl. 514—277 **8 Claims**

1. A N-substituted 4(3-trifluoromethylphenyl)1,2,3,6-tetrahydropyridine of formula (I)



(I)

wherein

A represents a group —E—G wherein:

- —E— is a straight or branched alkylene radical of from 2 to 4 carbon atoms,
- —G represents a radical selected from the group consisting of naphthyl substituted with methylenedioxy and naphthyl di-substituted bearing two substituents at the positions 5-, 6-, 7-, 8-, said substituents being hydroxy, $(C_1–C_4)$alkoxy or $(C_1–C_4)$alkyl, and the salts thereof with mineral or organic acids.

5,462,946

NITROXIDES AS PROTECTORS AGAINST OXIDATIVE STRESS

James B. Mitchell, Damascus, Md.; Amram Samuni, Jerusalem, Islamic Rep. of Iran; William DeGraff, Wheaton, Md., and Stephen Hahn, Great Falls, Va., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Continuation of Ser. No. 494,532, Mar. 16, 1990, abandoned. This application Mar. 20, 1992, Ser. No. 859,622

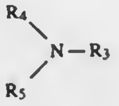
Int. Cl.^{6} A61K ***31/445;31/505;31/52;31/44;31/425;31/415;31/40***

U.S. Cl. 514—315 **34 Claims**

27. A pharmaceutical composition, comprising an anti-oxidative stress effective amount of a compound selected from the group consisting of the oxidized form of a metal-independent nitroxide, the oxidized form of an oxazolidine compound capable of forming an oxazolidine-1-oxyl, and a physiologically acceptable salt thereof, and

a biologically acceptable carrier,

wherein the compound has the formula:



wherein R_3 is selected from the group consisting of –O. and —OH, and R_4 and R_5 combine together with the nitrogen to form a heterocyclic group, or

wherein R_4 and R_5 themselves comprise a substituted or unsubstituted cyclic or heterocyclic group, or a physiologically acceptable salt thereof, said heterocyclic group being selected from the group consisting of a piperidine, pyrrole, imidazole, oxazole, thiazole, pyrazole, 3-pyrroline, pyrrolidine, pyridine, pyrimidine, purine, and a derivative thereof, and

wherein said pharmaceutical composition is in a form selected from the group consisting of an emulsion, suspension, ointment, cream, aerosol, granule, powder, spray, tablet, capsule, sachet, lozenge, ampoule, pessary, and suppository.

5,462,947

CENTRALLY ACTING SUBSTITUTED PHENYLAZACYCLOALKANES

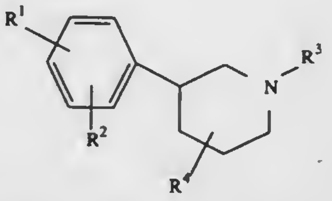
Kjell A. I. Svensson, Goteborg; Hakan V. Wikstrom, Groningen; Per A. E. Carlsson, Goteborg; Anna M. P. Boije, Lerum; R. Nicholas Waters; Clas A. Sonesson, both of Goteborg; Nils P. Stjernlof, Vastra Frolunda; Bengt R. Andersson, and Lars O. Hansson, both of Goteborg, all of, Sweden, assignors to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 686,799, Apr. 17, 1991, abandoned. This application Oct. 12, 1993, Ser. No. 133,606

Int. Cl.^{6} A61K ***31/445;*** **C07D** ***211/18***

U.S. Cl. 514—317 **9 Claims**

1. A compound of formula I



or a pharmaceutically acceptable salt thereof,

R^1 aim R^2 are independently H (provided [hat not more than one is H), $CONH_2$, OH, CN, CH_2CN, OSO_2CH_3, OSO_2CF_3, SSO_2CF_3, COR, SO_xCH_3 (where x is 0–2, SO_xCF_3, $O(CH_2)_xCF_3$, $OSO_2N(R)_2$, CH=NOR, COCOOR, $COCOON(R)_2$, $C_{3\text{-}8}$ cycloalkyl, $NRSO_2CF_3$, phenyl at position 2, 3 or 4, thienyl, furyl, pyrrolyl, oxazolyl, thiazolyl, N-pyrrolinyl, triazolyl, tetrazolyl of pyridinyl;

^{3} is hydrogen, CF_3, CH_2CF_3, C_1–C_8 alkyl, C_3–C_8 cycloalkyl, C_4–C_9 cycloalkyl-methyl, C_2–C_8 alkenyl, C_2–C_8 alkynyl, 3.3.3-trifluoropropyl, 4.4.4-trifluorobutyl, or CH_2SCH_3,

R^4 and R are independently selected from hydrogen, $CF_3.CH_2CF_3$, C_1–C_8 alkyl, C_3–C_8 cycloalkyl, C_4–C_9 cycloalkyl-methyl, C_2 C_8 alkenyl, C_2–C_8 alkynyl, 3,3,3-trifluoropropyl, 4,4,4-trifluorobutyl or —$(CH_2)_m$—R^5 where m is 1–8;

R^5 is phenyl, phenyl, substituted with CN, CF_3, CH_2CF_3, C_1–C_8 alkyl, C_3–C_8 cycloalkyl, C_4–C_9 cycloalkyl-methyl, C_2–C_8 alkenyl or C_2–C_8 alkynyl substituent, 2-thiophenyl, 3-thiophenyl, —$NR^6CONR^6R^7$ or —$CONR^6R^7$; and

R^6 and R^7 are independently hydrogen, C_1–C_8 alkyl, C_3–C_8 cycloalkyl, C_4–C_9 cycloalkyl-methyl, C_2–C_8 alkenyl or C_2–C_8 alkynyl;

with the provisos that (i) when R^1 is CN, R^2 and R^4 are H, and R^3 is n-Pr then the compound is a pure enantiomer: and (ii) when R^1 or R^2 is OH, or $CONH_2$ then R^4 is not hydrogen or methyl.

5,462,948

TREATMENT OF ADDICTION TO DRUGS AND SUBSTANCES OF ABUSE

Jens K. Perregaard, Jaegerspris, Denmark, and Brenda Costall, Bradford, United Kingdom, assignors to H. Lundbeck A/S, Copenhagen-Valby, Denmark

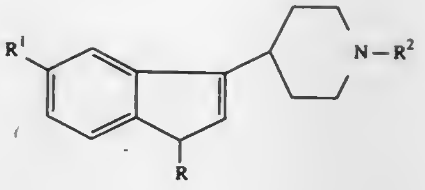
Filed Sep. 1, 1993, Ser. No. 115,450

Claims priority, application Denmark, Mar. 1, 1991, 0363/91

Int. Cl.^{6} A61K ***31/445***

U.S. Cl. 514—323 **3 Claims**

1. A method for alleviating, relieving or suppressing the withdrawal symptoms or suppressing the dependency of cocaine, diazepam, morphine, nicotine, alcohol, or amphetamines, comprising administering, an effective amount to a subject, a 1-aryl-3-(4-piperidyl)-indole derivative having the formula:



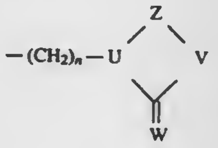
I

wherein,

R^1 is hydrogen, halogen, lower alkyl, lower alkoxy, hydroxy, cyano, nitro, lower alkylthio, trifluoromethyl, trifluoromethylthio, lower alkylsulfonyl, amino, lower alkylamino or lower dialkylamino;

R is phenyl optionally substituted with one or more substituents independently selected from the following: halogen, lower alkyl, lower alkoxy, hydroxy, trifluoromethyl, and cyano; and

R^2 is hydrogen, cycloalkyl having from three to eight carbon atoms, lower alkyl or lower alkenyl, optionally substituted with one or two hydroxy groups, any hydroxy group present being optionally esterified with an aliphatic carboxylic acid having from two to twenty-four carbon atoms inclusive, or R^2 is a group having Formula IV:



IV

wherein

n is an integer of from 2–6, inclusive;

W is O, S or N—R^3, wherein R^3 is H, lower alkyl or cycloalkyl having from three to eight carbon atoms;

U is N or CH;

Z is —$(CH_2)_m$—, m being 2 or 3, or Z is —CH=CH— or 1,2-phenylene optionally substituted with halogen or trifluoromethyl, or Z is —$COCH_2$— or —$CSCH_2$—;

V is O, S, CH_2, or NR^4, wherein R^4 is hydrogen, lower alkyl optionally substituted with one or two hydroxy groups, lower alkenyl or a cycloalkylmethyl group, said cycloalkyl having from three to six carbon atoms inclusive;

or a pharmaceutically acceptable acid addition salt thereof;

or a pharmaceutically acceptable acylated prodrugs of free hydroxy or free amino groups.

5,462,949

METHODS OF INHIBITING FERTILITY IN WOMEN

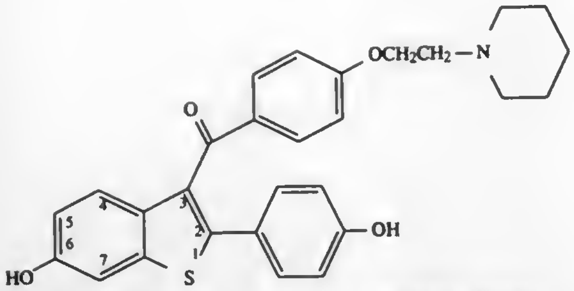
Charles D. Jones, and Frank C. Tinsley, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Dec. 21, 1993, Ser. No. 170,945

Int. Cl.^{6} A61K ***31/445***

U.S. Cl. 514—324 **2 Claims**

1. A method of inhibiting fertility in women comprising administering to a female human an effective amount of a compound having the formula



(I)

and pharmaceutically acceptable salts and solvates thereof.

5,462,950

METHODS OF TREATING MENSTRUAL SYMPTOMS AND COMPOSITIONS THEREFORE

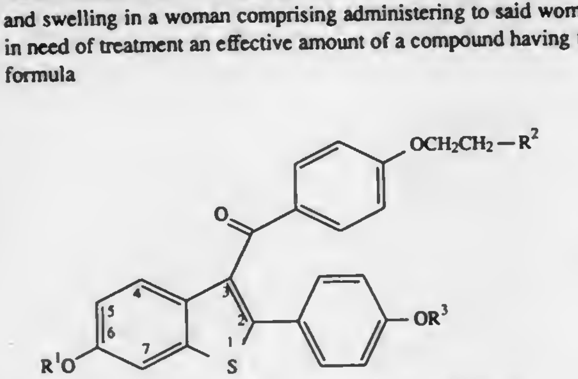
Steven A. Fontana, Martinsville, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Dec. 21, 1993, Ser. No. 171,392

Int. Cl.^{6} A61K *31/445;31/40;31/38*

U.S. Cl. 514—324 **12 Claims**

1. A method of alleviating one or more physical menstrual symptoms selected from the group consisting of dizziness, faintness, cold sweats, nausea, vomiting, hot flashes, muscle stiffness, headache, cramps, backache, fatigue, general aches, and pains, and water retention-related weight gain, skin disorders, painful breasts, and swelling in a woman comprising administering to said woman in need of treatment an effective amount of a compound having the formula



I

wherein R^1 and R^3 are independently hydrogen, —CH_3, —CO—(C_1–C_6 alkyl), or —CO—Ar in which Ar is optionally substituted phenyl; and

R^2 is selected from the group consisting of pyrrolidino, hexamethyleneimino and piperidino; or a pharmaceutically acceptable salt or solvant thereof.

5,462,951

PHARMACEUTICAL COMPOSITION CONTAINING SLIGHTLY WATER-SOLUBLE DRUG

Toru Iwao; Kenichi Hirai; Nobuo Kondoh; Koichi Yamanouchi, and Kazumasa Yokoyama, all of Hirakata, Japan, assignors to The Green Cross Corporation, Osaka, Japan

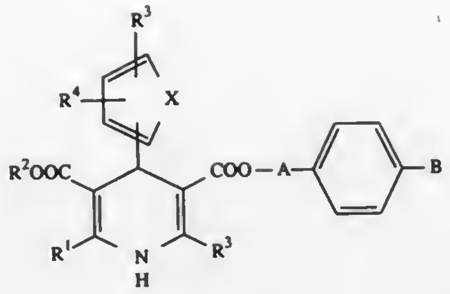
Continuation of Ser. No. 672,498, Mar. 20, 1991, abandoned. This application Sep. 3, 1993, Ser. No. 115,785

Claims priority, application Japan, Mar. 23, 1990, 2-73695

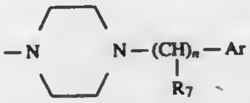
Int. Cl.^{6} A61K *31/44;31/495;47/00*

U.S. Cl. 514—334 **15 Claims**

2. A pharmaceutical composition for oral administration, comprising a slightly water-soluble drug selected from the group consisting of dihydropyridine derivatives of the formula



wherein R^1, R^2, and R^3 are the same or different and are an alkyl, a cycloalkyl or an alkoxyalkyl, R^4 and R^5 are the same or different and are hydrogen atom, a halogen, nitro, a halogenated alkyl, an alkylsulfonyl, a halogenated alkoxy, an alkylsulfinyl, an alkyl, a cycloalkyl, an alkoxy, cyano, an alkoxycarbonyl or an alkylthio wherein R^4 and R^5 are not hydrogen atoms at the same time, X is a group of vinylene or azomethine, A is an alkylene and B is —$N(R^6)_2$



wherein R^6 and R^7 are respectively hydrogen atom, an alkyl, a cycloalkyl, an aralkyl, an aryl or pyridyl, Ar is an aryl or pyridyl and n is an integer of 0 to 2, or their acid addition salts dissolved in fatty acid monoglyceride and adsorbed onto a porous inorganic substance.

5,462,952

FENAMATE 1,3,4-THIADIAZOLES AND 1,3,4-OXADIAZOLES AS ANTIINFLAMMATORY AGENTS

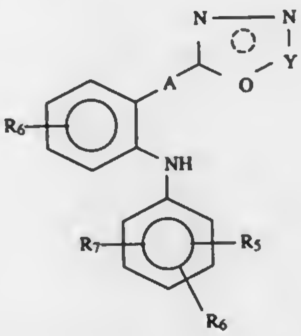
Diane H. Boschelli, Plymouth; David T. Connor, and Milton L. Hoefle, both of Ann Arbor, all of Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation of Ser. No. 769,562, Oct. 2, 1991, abandoned, which is a continuation of Ser. No. 506,768, Apr. 12, 1990, abandoned, which is a continuation-in-part of Ser. No. 364,407, Jun. 9, 1989, abandoned. This application Sep. 8, 1993, Ser. No. 118,480

Int. Cl.^{6} C07D *271/113;* **A61K** *31/41;* **A01N** *43/82*

U.S. Cl. 514—364 **31 Claims**

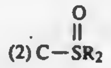
1. A compound of the formula (II)



and a pharmaceutically acceptable salt thereof; wherein

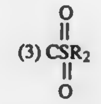
A is a bond, CH_2 or CH=CH;

Y is (1) C—SR$_1$ wherein R$_1$ is H or lower alkyl,



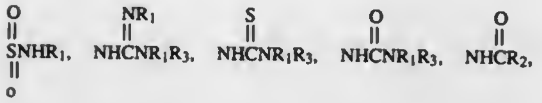
$$(2)\ \overset{\overset{O}{\|}}{C}-SR_2$$

wherein R$_2$ is lower alkyl,

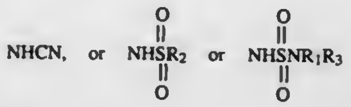


$$(3)\ C\underset{\underset{O}{\|}}{\overset{\overset{O}{\|}}{S}}R_2$$

wherein R$_2$ is as defined above, (4) C—NR$_1$R$_3$ wherein R$_1$ is independently as defined above and R$_3$ is hydrogen or lower alkyl, (5) CR$_4$ wherein R$_4$ is lower alkyl, halogen, CF$_3$, CO$_2$R$_1$, or



$$\underset{\underset{O}{\|}}{\overset{\overset{O}{\|}}{S}}NHR_1,\quad NHC\overset{\overset{NR_1}{\|}}{}NR_1R_3,\quad NH\overset{\overset{S}{\|}}{C}NR_1R_3,\quad NH\overset{\overset{O}{\|}}{C}NR_1R_3,\quad NH\overset{\overset{O}{\|}}{C}R_2,$$



$$NHCN,\ \text{or}\ NH\underset{\underset{O}{\|}}{\overset{\overset{O}{\|}}{S}}R_2\ \text{or}\ NH\underset{\underset{O}{\|}}{\overset{\overset{O}{\|}}{S}}NR_1R_3$$

wherein R$_1$, R$_2$, and R$_3$ are independently as defined above;

R$_5$, R$_6$, and R$_7$ are independently lower alkyl, fluoro, chloro, bromo, iodo, trifluoromethyl, CN, hydroxy, lower alkoxy, —S(O)$_n$-lower alkyl wherein n is an integer of 0 through 2, NO$_2$ or NR$_9$R$_{10}$ wherein R$_9$ and R$_{10}$ are independently H, lower alkyl, or acyl;

and R$_8$ is hydrogen, lower alkyl, fluoro, chloro, bromo, iodo, trifluoromethyl, CN, hydroxy, lower alkoxy, —S(O)$_n$-lower alkyl wherein n is an integer of 0 through 2, NO$_2$ or NR$_9$R$_{10}$ wherein R$_9$ and R$_{10}$ are independently H, lower alkyl, or acyl.

5,462,953
BENZOXAZOLYL DERIVATIVES USEFUL AS 5-LIPOXYGENASE INHIBITORS

Pierre A. R. Bruneau, Ludes, France; Graham C. Crawley, Kerridge, and Keith Oldham, Poynton, both of, England, assignors to Imperial Chemical Industries PLC, London, United Kingdom, and ICI Pharma, Cergy Cedex, France

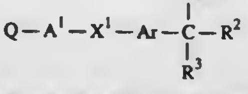
Division of Ser. No. 133,335, Oct. 8, 1993, Pat. No. 5,364,877, which is a division of Ser. No. 950,164, Sep. 19, 1992, Pat. No. 5,278,177, which is a division of Ser. No. 717,501, Jun. 19, 1991, Pat. No. 5,179,115. This application Jul. 15, 1994, Ser. No. 275,380

Claims priority, application United Kingdom, Jun. 21, 1990, 9001759

Int. Cl.^{6} A61K *31/42;* **C07D** *413/10*

U.S. Cl. 514—379 **5 Claims**

1. A bicyclic heterocyclic derivative of the formula I



I

$$Q-A^1-X^1-Ar-\underset{\underset{R^3}{|}}{\overset{\overset{OR^1}{|}}{C}}-R^2$$

wherein Q is a benzoxazolyl or a hydrogenated derivative thereof which substituent Q may optionally bear one or two oxo or thioxo substituents and up to four further substituents selected from halogeno, hydroxy, cyano, amino, (1–4C)alkyl, (1–4C)alkoxy, fluoro-(1–4C)alkyl, (1–4C)alkylamino; di-[(1–4C)alkyl]amino, amino-(1–4C)alkyl, (1–4C)alkylamino-(1–4C)alkyl, di-[(1–4C)alkyl]amino-(1–4C)alkyl, phenyl and phenyl-(1–4C)alkyl, and

wherein said phenyl or phenyl-(1–4C)alkyl substituent may optionally bear a substituent selected from halogeno, (1–4C)alkyl and (1–4C)alkoxy;

wherein A^1 is a direct link to X^1 or is (1–3C)alkylene;

wherein X^1 is oxy, thio, sulphinyl, sulphonyl or imino;

wherein Ar is phenylene which may optionally bear one or two substituents selected from halogeno, hydroxy, amino, nitro, cyano, carbamoyl, ureido, (1–4C)alkyl, (1–4C)alkoxy, (1–4C)alkylamino, di-[(1–4C)alkylamino, fluoro-(1–4C)alkyl and (2–4C)alkanoylamino;

wherein R^1 is (1–4C)alkyl, (3–4C)alkenyl or (3–4C)alkynyl; and

wherein R^2 and R^3 together form a group of the formula —A^2—X^2—A^3— which, together with the carbon atom to which A^2 and A^3 are attached, defines a ring having 5 to 7 ring atoms, wherein A^2 and A^3 which may be the same or different, each is (1–3C)alkylene and X^2 is oxy, thio, sulphinyl or sulphonyl, and which ring may bear one, two or three substituents, which may be the same or different, selected from hydroxy, (1–4C)alkyl and (1–4C)alkoxy;

or wherein R^1 and R^2 together form a group of the formula —A^2—X^2—A^3— which, together with the oxygen atom to which A^2 is attached and with the carbon atom to which A^3 is attached, defines a ring having 5 to 7 ring atoms, wherein A^2 and A^3 which may be the same or different, each is (1–3C)alkylene and X^2 is oxy, thio, sulphinyl or sulphonyl, and which ring may bear one, two or three (1–4C)alkyl substituents,

and wherein R^3 is (1–4C)alkyl, (2–4C)alkenyl or (2–4C)alkynyl; or a pharmaceutically-acceptable salt thereof.

5,462,954
SUBSTITUTED PHENYL PHENOL LEUKOTRIENE ANTAGONISTS

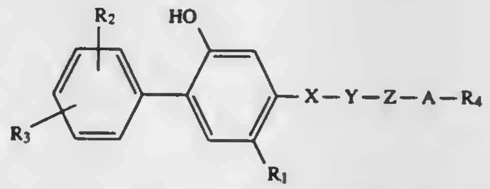
S. Richard Baker, Indianapolis; Robert D. Dillard, Zionsville, both of Ind.; Paul E. Floreancig, Mountain View, Calif.; J. Scott Sawyer, Indianapolis, and Michael J. Sofia, Carmel, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation of Ser. No. 797,522, Nov. 25, 1991, abandoned. This application Nov. 1, 1994, Ser. No. 333,122

Int. Cl.^{6} A61K *31/19;31/41;* **C07D** *257/04;311/24;* **C07C** *59/68;65/24*

U.S. Cl. 514—381 **38 Claims**

1. A compound of the formula:



or a pharmaceutically acceptable base addition salt thereof, wherein:

R$_1$ is C$_1$–C$_5$ alkyl, C$_2$–C$_5$ alkenyl, C$_2$–C$_5$ alkynyl, C$_1$–C$_4$ alkoxy, (C$_1$–C$_4$ alkyl)thio, halo, or R$_2$-substitutedphenyl;

each R$_2$ and R$_3$ are each independently hydrogen, halo, hydroxy, C$_1$–C$_4$ alkyl, C$_1$–C$_4$ alkoxy, (C$_1$–C$_4$ alkyl)—S(O)$_q$—, trifluoromethyl, or di-(C$_1$–C$_3$ alkyl) amino;

X is —O—, —S—, —C(=O), or —CH$_2$—;

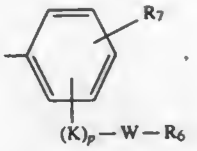
Y is —O— or —CH$_2$—;

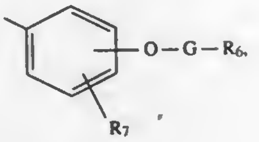
or when taken together, —X—Y— is —CH=CH— or —C≡C—;

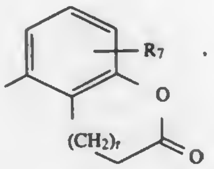
Z is a straight or branched chain C$_1$–C$_{10}$ alkylidenyl;

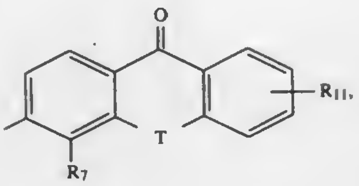
A is a bond, —O—, —S—, —CH=CH—, or CR$_a$R$_b$—, where R$_a$ and R$_b$ are each independently hydrogen, C$_1$–C$_5$ alkyl, or R$_7$-substitutedphenyl, or when taken together with the carbon atom to which they are attached form a C$_4$–C$_8$ cycloalkyl ring;

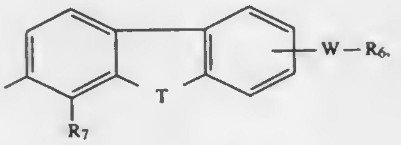
R_4 is R_6,

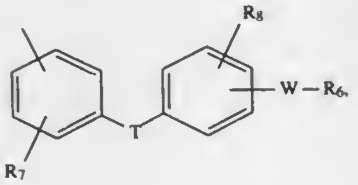




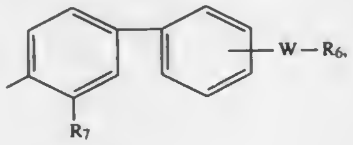








or



where

each R_6 is independently —COOH, 5-tetrazolyl, —CON$(R_9)_2$, or —CONHSO$_2$R$_{10}$;

each R_7 is hydrogen, C_1–C_4 alkyl, C_2–C_5 alkenyl, C_2–C_5 alkynyl, benzyl, methoxy, —W—R_6, —T—G—R_6, (C_1–C_4 alkyl)—T— (C_1–C_4 alkylidenyl)—O—, or hydroxy;

R_8 is hydrogen or halo;

each R_9 is independently hydrogen, phenyl, or C_1–C_4 alkyl, or when taken together with the nitrogen atom form a morpholino, piperidino, piperazino, or pyrrolidino group;

R_{10} is C_1–C_4 alkyl or phenyl;

R_{11} is R_2, —W—R_6, or —T—G—R_6;

each W is a bond or straight or branched chain divalent hydrocarbyl radical of one to eight carbon atoms;

each G is a straight or branched chain divalent hydrocarbyl radical of one to eight carbon atoms;

each T is a bond, —CH$_2$—, —O—, —NH—, —NHCO—, —C(=O)—, or —S(O)q—;

K is —C(=O)— or —CH(OH)—;

each q is independently 0, 1, or 2;

p is 0 or 1; and

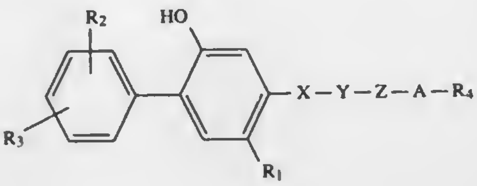
t is 0 or 1;

provided when X is —O— or —S—, Y is not —O—;

provided when A is —O— or —S—, R_4 is not R_6;

and provided W is not a bond when p is 0.

30. A method of treating a mammal to regress or prevent the inflammation or allergic disorders of psoriasis, arthritis, chronic lung disease, acute respiratory distress syndrome, shock, asthma, and inflammatory bowel disease; wherein the method comprises administering to said mammal a therapeutically effective amount of a compound of the formula:



or a pharmaceutically acceptable base addition salt thereof, wherein:

R_1 is C_1–C_5 alkyl, C_2–C_5 alkenyl, C_2–C_5 alkynyl, C_1–C_4 alkoxy, (C_1–C_4 alkyl)thio, halo, or R_2-substitutedphenyl;

each R_2 and R_3 are each independently hydrogen, halo, hydroxy, C_1–C_4 alkyl, C_1–C_4 alkoxy, (C_1–C_4 alkyl)—S(O)$_q$—, trifluoromethyl, or di-(C_1–C_3 alkyl) amino;

X is —O—, —S—, –C(=O), or —CH$_2$—;

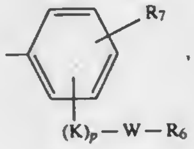
Y is —O— or —CH$_2$—;

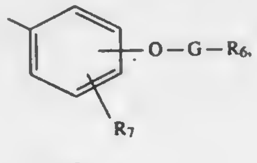
or when taken together, —X—Y— is —CH=CH— or —C≡C—;

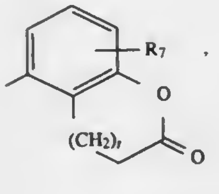
Z is a straight or branched chain C_1–C_{10} alkylidenyl;

A is a bond, —O—, —S—, —CH=CH—, or CR$_a$R$_b$—, where R_a and R_b are each independently hydrogen, C_1–C_5 alkyl, or R_7-substitutedphenyl, or when taken together with the carbon atom to which they are attached form a C_4–C_8 cycloalkyl ring;

R_4 is R_6,







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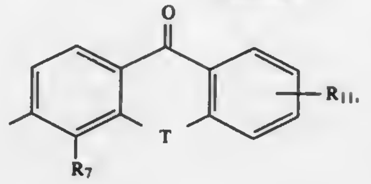
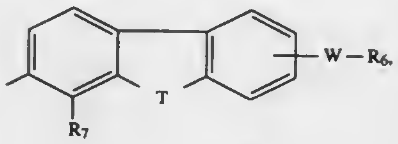
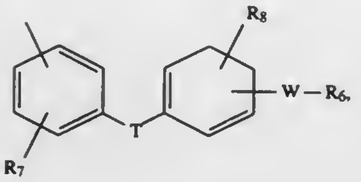
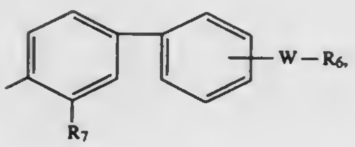






or



where

each R_6 is independently —COOH, 5-tetrazolyl, —CON$(R_9)_2$, or —CONHSO_2R_{10};

each R_7 is hydrogen, C_1–C_4 alkyl, C_2–C_5 alkenyl, C_2–C_5 alkynyl, benzyl, methoxy, —W—R_6, —T—G—R_6, (C_1–C_4 alkyl)—T— (C_1–C_4 alkylidenyl)—O—, or hydroxy;

R_8 is hydrogen or halo;

each R_9 is independently hydrogen, phenyl, or C_1–C_4 alkyl, or when taken together with the nitrogen atom form a morpholino, piperidino, piperazino, or pyrrolidino group;

R_{10} is C_1–C_4 alkyl or phenyl;

R_{11} is R_2, —W—R_6, or —T—G—R_6;

each W is a bond or straight or branched chain divalent hydrocarbyl radical of one to eight carbon atoms;

each G is a straight or branched chain divalent hydrocarbyl radical of one to eight carbon atoms;

each T is a bond, —CH_2—, —O—, —NH—, —NHCO—, —C(=O)—, or —S(O)q—;

K is –C(=O)— or —CH(OH)—;

each q is independently 0, 1, or 2;

p is 0 or 1; and

t is 0 or 1;

provided when X is —O—or —S—, Y is not —O—;

provided when A is —O—or —S—, R_4 is not R_6;

and provided W is not a bond when p is 0.

5,462,955

AZOLYLMETHYL-FLUOROCYCLOPROPYL DERIVATIVES

Jürgen Scherkenbeck, Leverkusen; Thomas Himmler, Odenthal; Stefan Böhm, Cologne; Hermann Hagemann, Leverkusen; Klaus Stroech, Solingen; Stefan Dutzmann, Hilden; Heinz-Wilhelm Dehne, Monheim, and Gerd Hänssler, Leverkusen, all of, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation of Ser. No. 26,663, Mar. 4, 1993, abandoned.

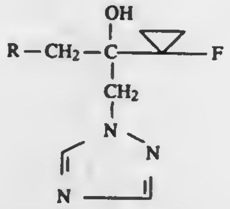
This application Feb. 15, 1994, Ser. No. 197,016

Claims priority, application Germany, Mar. 13, 1992, 42 08 050.9

Int. Cl.^{6} A01N *43/653;* **C07D** *249/08*

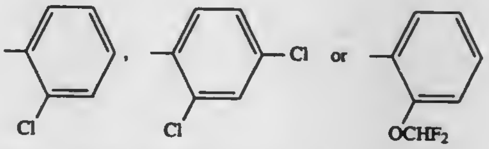
U.S. Cl. 514—383 **7 Claims**

1. An azolylmethyl-fluorocyclo-propyl derivative of the formula



in which

R represents a group of the formula



or an addition product thereof with an acid or metal salt.

5,462,956

EPIBATIDINE AND DERIVATIVES, COMPOSITIONS AND METHODS OF TREATING PAIN

John W. Daly, Washington, D.C.; Thomas F. Spande, Bethesda, and Hugo M. Garraffo, Rockville, both of Md., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

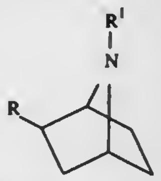
Division of Ser. No. 845,042, Mar. 3, 1992, Pat. No. 5,314,899.

This application May 23, 1994, Ser. No. 248,314

Int. Cl.^{6} A61K *31/40;* **C07D** *403/04*

U.S. Cl. 514—397 **23 Claims**

1. A compound having the formula:



wherein R^1 is selected from the group consisting of H, C_1–C_6 alkyl, C_3–C_9 cycloalkyl, C_2–C_8 acyl, C_4–C_9 cycloalkylalkyl, C_1–C_6 haloalkyl, C_2–C_{20} alkenyl, C_2–C_{20} alkynyl, C_1–C_{10} hydroxyalkyl, C_3–C_8 cycloalkenyl, C_3–C_8 cycloalkynyl, and phenyl; and wherein R is selected from the group consisting of thienyl, furanyl, and imidazolyl, where said R groups are unsubstituted or substituted with one or more substituents selected from the group consisting of hydroxyl, C_1–C_6 alkyl, C_2–C_6 alkenyl, C_1–C_6 alkoxyl, halo, C_1–C_6 haloalkyl, amino,

C_1–C_6 alkylamino, C_2–C_{10} dialkylamino, and sulfonamido; or a pharmaceutically acceptable salt thereof.

5,462,957

AZOLE DERIVATIVES, PHARMACEUTICAL COMPOSITIONS CONTAINING THE SAME, AND METHOD FOR TREATING MYCOSIS AND ESTROGEN-DEPENDENT DISEASES

Koichi Niimura, Saitama; Yuko Ikeda, Chiba; Akira Kato, and Takao Ando, both of Tokyo, all of, Japan, assignors to Kureha Chemical Industry Co., Ltd., Japan

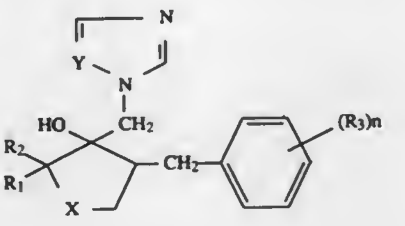
Division of Ser. No. 183,339, Jan. 19, 1994, which is a division of Ser. No. 120,758, Sep. 15, 1993, Pat. No. 5,407,952, which is a division of Ser. No. 67,052, May 26, 1993, Pat. No. 5,324,740. This application Dec. 28, 1994, Ser. No. 365,128

Claims priority, application Japan, Jun. 6, 1992, 4-171731

Int. Cl.⁶ A61K *31/415;* **C07D** *409/06;405/06;403/06*

U.S. Cl. 514—397 **4 Claims**

1. A pharmaceutical composition comprising an aromarase-inhibiting effective amount of an azole derivative of the formula:



including stereoisomers thereof, wherein R_1 and R_2 each are H or C_1–C_4 alkyl; R_3 is H, OH, CN, halogen, haloalkyl, C_1–C_4 alkyl, or phenyl, and if there are two or more R_3 groups, such R_3 groups may be the same or different; n is an integer from 0 to 5; Y is CH; and X is O, S, or NH; or a pharmaceutically acceptable salt thereof and

a pharmaceutically acceptable carrier or diluent.

5,462,958

BENZENE DERIVATIVES AND METHOD OF TREATING ARTERIOSCLEROSIS WITH BENZENE DERIVATIVES

Kenji Hayashi; Nobuhisa Watanabe; Koichi Nose; Hiroshi Tanaka; Issei Ohtsuka; Motoji Kokushi; Hironobu Hiyoshi; Hiroko Kobayashi; Toshie Yamada, and Toru Horie, all of Ibaraki, Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

PCT No. PCT/JP93/00961, § 371 Date May 19, 1994, § 102(e) Date May 19, 1994, PCT Pub. No. WO94/02452, PCT Pub. Date Mar. 2, 1994

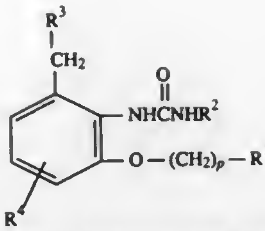
PCT Filed Jul. 12, 1993, Ser. No. 182,061

Claims priority, application Japan, Jul. 20, 1992, 4-213242; Sep. 30, 1992, 4-283432

Int. Cl.⁶ A61K *31/415;31/195;* **C07C** *275/34;* **C07D** *233/60*

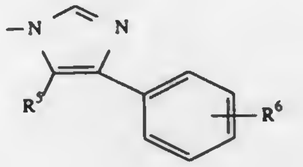
U.S. Cl. 514—399 **7 Claims**

1. A benzene derivative represented by the following formula (I) or a pharmacologically acceptable salt thereof:



(I)

wherein R^1 represents a carboxyl group which may be protected or a group represented by the formula:



wherein R^5 represents a lower alkyl group or a hydroxyalkyl group and R^6 represents a hydrogen atom or a hydroxyl group;

R^2 represents a hydrogen atom, a lower alkyl group, a hydroxyalkyl group or a carboxyalkyl group;

R^3 and R^4 each represent a hydrogen atom or a hydroxyl group; and

p is an integer of 1 to 6

with the proviso that when R^4 is a hydrogen atom, and R^2 is a hydrogen atom or a lower alkyl group, R^1 is a carboxyl group which may be protected.

5,462,959

4-ARYL-IMIDAZOLE DERIVATIVES

John H. Pick, and Robert T. Logan, both of Lanarkshire, Scotland, assignors to Akzo N.V., Arnhem, Netherlands

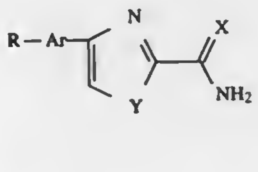
Division of Ser. No. 857,526, Mar. 19, 1992, Pat. No. 5,254,575. This application Oct. 14, 1993, Ser. No. 136,530

Claims priority, application European Pat. Off., Mar. 25, 1991, 91302573

Int. Cl.⁶ C07D *233/90;* **A01K** *31/415*

U.S. Cl. 514—400 **5 Claims**

1. A 4-aryl-imidazole derivative having the formula I



I

wherein

X is NOH;

Y is NH;

Ar is phenyl;

R is one to four substituents independently selected from the group consisting of hydrogen, hydroxy, lower alkyl, lower alkoxy, lower thiolalkyl, cycloalkyl, halogen, CF_3, NO_2, and

O—ALK—NR_1R_2, in which ALK is a saturated aliphatic hydrocarbon group having from two to six carbon atoms, and R_1 and R_2 are independently hydrogen or lower alkyl, or form, together with the nitrogen atom to which they are bonded, a heterocyclic ring consisting of a 5- or 6-membered ring and wherein said heterocyclic ring may contain a second hereto atom of nitrogen or oxygen and be substituted with a lower alkyl; or

a pharmaceutically salt thereof.

5,462,960

PYRAZOLE-3-CARBOXAMIDE DERIVATIVES, PROCESS FOR THEIR PREPARATION AND PHARMACEUTICAL COMPOSITIONS IN WHICH THEY ARE PRESENT

Francis Barth; Pierre Casellas, both of Montpellier; Christian Congy, Saint Gely du Fesc; Serge Martinez, Montpellier, and Murielle Rinaldi, Saint Georges d'Orques, all of, France, assignors to Sanofi, Paris, France

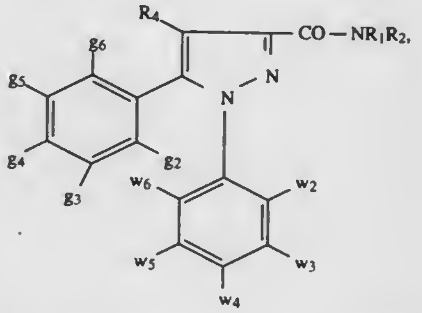
Filed Dec. 16, 1994, Ser. No. 357,880

Claims priority, application France, Dec. 17, 1993, 93 15221

Int. Cl.^{6} C07D *231/14;* A61K *31/415*

U.S. Cl. 514—406 **20 Claims**

1. A compound of the formula



(I)

in which:

g_2, g_3, g_4, g_5 and g_6, and w_2, w_3, w_4, w_5 and w_6, are identical or different and are independently hydrogen, a chlorine, bromine or iodine atom, a $(C_1–C_3)$alkyl, a $(C_1–C_3)$alkoxy, a trifluoromethyl or a nitro group and g_4 can also be a phenyl group;

R_1 is a $(C_1–C_6)$alkyl or a hydrogen;

R_2 is $-^+NR_3R_5R_6$ or $—NR_5R_6$;

R_3 is a $(C_1–C_6)$alkyl or R_3 forms a bridge with one of the atoms of the heterocyclic radical formed by NR_5R_6;

R_4 is hydrogen or a $(C_1–C_5)$alkyl; and

R_5 is hydrogen or a $(C_1–C_6)$alkyl and R_6 is hydrogen, a $(C_1–C_6)$alkyl, a phenyl or a $(C_3–C_8)$cycloalkyl, with the proviso that both R_5 and R_6 cannot both be H; or R_5 and R_6, together with the nitrogen atom to which they are bonded, form a 5- to 10-membered saturated or unsaturated heterocyclic radical which is unsubstituted or monosubstituted or polysubstituted by a $(C_1–C_6)$alkyl, a benzyl, a phenyl, a hydroxyl, a $(C_1–C_6)$alkoxy or a halogen, with the proviso that if R_2 is NR_5R_6, R_5 and R_6, together with the nitrogen atom to which they are bonded, form a heterocyclic radical other than a 5- to 8-membered saturated radical which is unsubstituted or substituted by a $(C_1–C_3)$alkyl, a hydroxyl or a benzyl, its salts and their solvates.

5,462,961

PYRAZOLE OXIME DERIVATIVES, COMPOSITIONS AND USE

Naoto Meki, Kobe; Tomotoshi Imahase, Takarazuka; Kazue Nishida, Tokyo; Hiroaki Fujimoto, Toyonaka; Kenichi Mikitani, Takarazuka; Hirotaka Takano, Sanda; Yoriko Ogasawara, Toyonaka, and Masahiro Tamaki, Takarazuka, all of, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

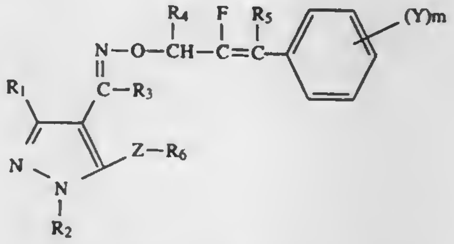
Continuation of Ser. No. 497,673, Mar. 23, 1990, abandoned. This application Aug. 5, 1991, Ser. No. 742,711

Claims priority, application Japan, Mar. 31, 1989, 1-82672; Jan. 31, 1990, 2-23431

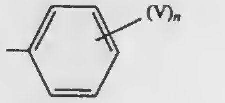
Int. Cl.^{6} A01N *43/56;* C07D *231/20*

U.S. Cl. 514—407 **16 Claims**

1. A heterocyclic compound represented by the formula,



wherein R_1 is hydrogen, $C_1–C_4$ alkyl or phenyl; R_2 is hydrogen or $C_1–C_4$ haloalkyl; R_3 is hydrogen, $C_1–C_4$ alkyl or phenyl; each of R_4 and R_5, which may be the same or different, is hydrogen or $C_1–C_4$ alkyl; each of Y's, which may be the same or different, is hydrogen, halogen, $C_1–C_4$ alkyl, $C_1–C_4$ haloalkyl, $C_1–C_4$ alkoxy or $C_1–C_4$ haloalkoxy; R_6 is $C_1–C_{10}$ alkyl, $C_2–C_0$ haloalkyl, $C_2–C_{10}$ alkenyl, $C_2–C_{10}$ haloalkenyl, $C_2–C_{10}$ alkynyl, $C_2–C_{10}$ haloalkynyl, $C_1–C_4$ alkoxy $C_2–C_8$ alkyl, $C_1–C_4$ alkyl $C_2–C_8$ thioalkyl, $C_3–C_{10}$ cycloalkyl or



(in which each of V's, which may be the same or different, is hydrogen, halogen, $C_1–C_4$ alkyl, $C_1–C_4$ haloalkyl, $C_1–C_4$ alkoxy or $C_1–C_4$ haloalkoxy); Z is oxygen or sulfur; and each of m and n is an integer of 1 to 5.

5,462,962

TETRAHYDROBENZ[C,D]INDOLE SEROTONIN AGONISTS

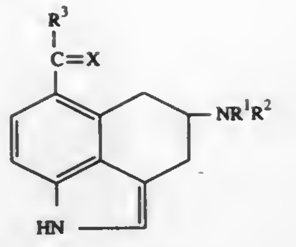
Michael E. Flaugh, and Mark M. Foreman, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 482,811, Feb. 26, 1990, Pat. No. 5,204,340, which is a continuation-in-part of Ser. No. 336,409, Apr. 11, 1989, abandoned. This application Dec. 15, 1992, Ser. No. 992,410

Int. Cl.^{6} A61K *31/40;31/535*

U.S. Cl. 514—411 **8 Claims**

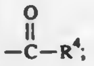
1. A method for selectively blocking $5\text{-}HT_{1A}$ receptors in a mammal said method comprising administering to said mammal an amount of a compound of the Formula I



(I)

wherein:

R^1 is hydrogen, C_1–C_4 alkyl, allyl or



$-\overset{\overset{O}{\|}}{C}-R^4$;

R^2 is hydrogen, C_1–C_4 alkyl or allyl;

R^3 is hydrogen, C_1–C_4 alkoxy, —NR^{5}R^6 or C_1–C_4 alkylthio;

R^4 is hydrogen, methyl, ethyl or vinyl;

R^5 and R^6 are independently a C_2–C_4 alkyl, a C_1–C_4 alkyl substituted with a phenyl group, or a phenyl group or R^5 and R^6 together form a C_3–C_5 heterocyclic ring;

X is O or S; or

a pharmaceutically acceptable salt thereof, sufficient to block at least a portion of said 5-HT$_{1A}$ receptors.

5,462,963

CHELATOR COMPOSITIONS COMPRISING α-DIAMINE COMPOUNDS

Rodney D. Bush, Fairfield, and Donald L. Bissett, Hamilton, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

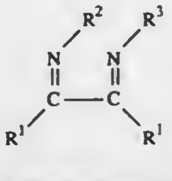
Continuation-in-part of Ser. No. 514,892, Apr. 26, 1990, abandoned. This application Aug. 2, 1991, Ser. No. 739,933

Int. Cl.^{6} A61K *31/34;31/38;31/40;31/15*

U.S. Cl. 514—248 **16 Claims**

1. A topical composition comprising:

(a) a safe and effective amount of one or more α-diamine compounds having the structure:



wherein each —R^1 is independently selected from the group consisting of alkyl, aryl, heteroaryl and heterocyclic, or the —R^1's are covalently bonded together to form a cyclic alkyl ring; each heteroaryl, if any, being independently selected from the group consisting of furyl, thienyl, pyrrolyl, imidazolyl, pyrazolyl, pyrazinyl, pyrimidinyl, pyridazinyl, isoquinolyl, purinyl, phthalazinyl, quinoxalinyl, furazanyl, isoxazolyl, and tetrazolyl; each heterocyclic ring, if any, being independently selected from the group consisting of the saturated analogs of the above listed group of heteroaryl rings;

—R^2 and —R^3 are —OR^4 in which case there is no bond or polar bond between —R^2 and the nitrogen covalently bonded to —R^3, each —R^4 being independently selected from the group consisting of hydrogen, alkyl and aryl, except that both —R^4's are not methyl when both —R^1's are furyl; or

—R^2— is —O— and is covalently bonded to the nitrogen which is covalently bonded to —R^3, and—R^3 is —O— there being a + charge on the nitrogen to which it is bonded) or nil;

wherein the α-diamine compounds consist essentially of compounds wherein =NR^2 and =NR^3 are in amphi configuration when both —R^2 and —R^3 are —OH, and when both —R^1's are furyl or the —R^1's are covalently bonded together to form a cyclohexanedione structure; and

(b) a pharmaceutically-acceptable topical carrier.

5,462,964

DIPEPTIDE BORONIC ACID INHIBITORS OF TRYPSIN-LIKE ENZYMES

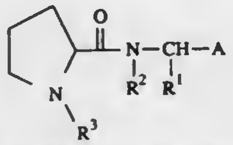
John M. Fevig, Lincoln University, Pa.; Matthew M. Abelman, Solana Beach, Calif.; Eugene C. Amparo, West Chester, Pa.; Joseph Cacciola; Charles A. Kettner, both of Wilmington, Del.; Gregory J. Pacofsky, Durham, N.C., and Chia-Lin Wang, Taipei, Taiwan, Prov. of China, assignors to The Du Pont Merck Pharmaceutical Company, Wilmington, Del.

Filed Oct. 20, 1993, Ser. No. 139,444

Int. Cl.^{6} A61K *31/40;* **C07D** *207/04*

U.S. Cl. 514—423 **12 Claims**

1. A compound of formula (I)



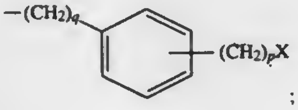
(I)

or a pharmaceutically acceptale salt wherein:

R^1 is

a) —(C_1–C_{12} alkyl)—X, or

b)



;

X is

- a) halogen
- b) —CN,
- c) —NO$_2$,
- d) —CF$_3$,
- e) —NH$_2$
- f) —NHC(=NH)H,
- g) —NHC(=NH)NHOH,
- h) —NHC(=NH)NHCN,
- i) —NHC(=NH)NHR^2,
- j) —NHC(=NH)NHC(=O)R^2,
- k) —C(=NH)NHR^2,
- l) —C(=NH)NHC(=O)R^2,
- m) —C(=O)NHR^2,
- n) —CO$_2$R^2,
- o) —OR^2,
- p) —OCF$_3$,
- q) —SR^2, or
- r) —SC(=NH)NHR^2;

R^2 is

- a) hydrogen,
- b) C_1–C_4 alkyl,
- c) aryl,
- d) —(C_1–C_4 alkyl)-aryl;

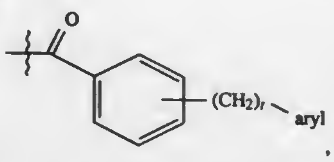
R^3 is

- a) —C(=O)CR^{6}R^7-aryl,
- b) —C(=O)—(C_2–C_5 alkenyl)-aryl,
- c) —C(=O)CR^{6}R^7(CH$_2$)$_r$—W—(CR^{6}R^7)$_r$-aryl,
- d) —C(=O)CR^{6}R^7(CH$_2$)$_r$CR^{8}R^9-aryl,
- e) —C(=O)CR^{6}R^7(CH$_2$)$_r$CR^{8}R^9-heteroaryl,,
- f) —C(=O)CR^{6}R^7(CH$_2$)$_r$CR^{8}R^9-heterocycle,
- g) —C(=O)-aryl,,
- h) —C(=O)-heteroaryl,
- i) —C(=O)-heterocycle,
- j) —C(=O)O(CH$_2$)$_r$-adamantyl,

k) —$C(=O)CH_2)_r$—(C_5–C_7 cycloalkyl),

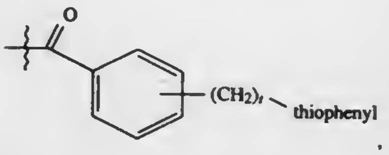
l) —$C(=O)(CH_2)_r$—W—(C_5–C_7 cycloalkyl),

m)

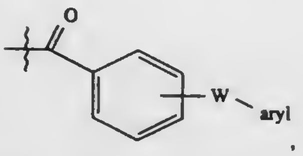


wherein aryl is limited to phenyl,

n)

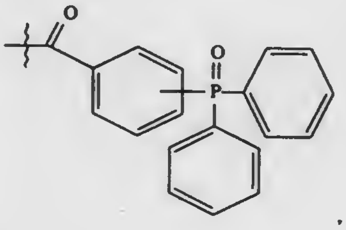


o)

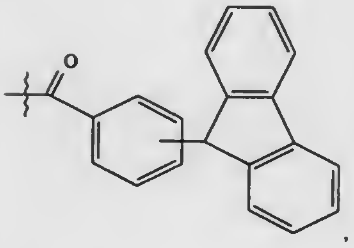


wherein aryl is limited to phenyl,

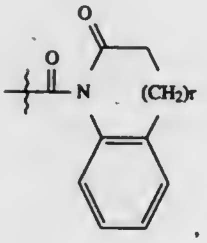
p)



q)



r)



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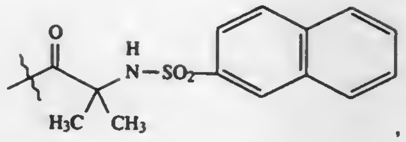
s)



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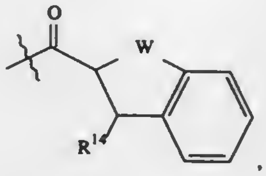

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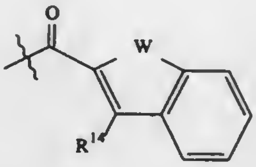
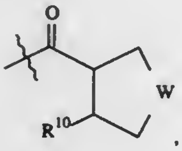


v)



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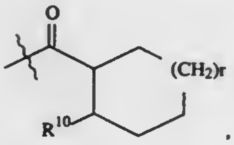
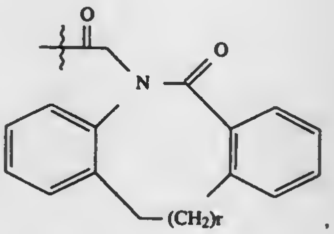
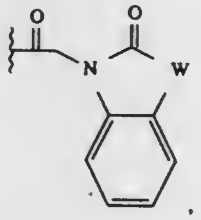


x)



y)



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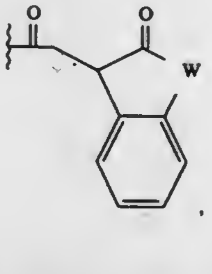

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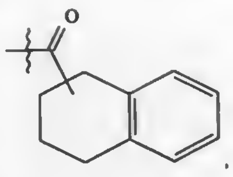
aa)



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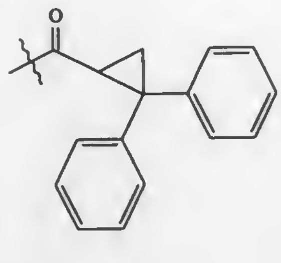

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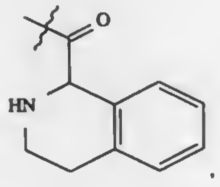

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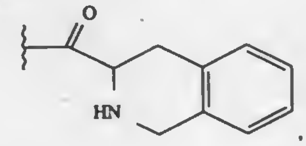
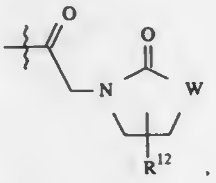


ee)



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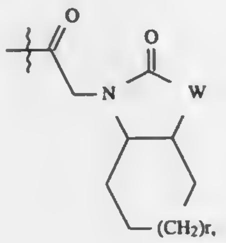
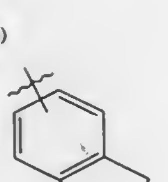


or

gg)



R^4 and R^5 are independently selected at each occurrence from the group consisting of:
- a) hydrogen,
- b) C_1–C_4 alkyl,
- c) —(C_1–C_4 alkyl)-aryl, or
- d) —C_5–C_7 cycloalkyl;

R^6, R^7, R^8 and R^9 are independently selected at each occurrence from the group consisting of:
- a) hydrogen,
- b) C_1–C_4 alkyl,
- c) C_1–C_4 alkoxy,
- d) aryl,
- e) —(C_1–C_4 alkyl)-aryl,
- f) —O—aryl, or
- g) —$(CH_2)_p$—CO_2R^4;

R^{10} is phenyl, where phenyl is optionally substituted with one to three substituents selected from the group consisting of: halogen, C_1–C_4 alkyl, C_1–C_4 alkoxy, methylenedioxy, —NO_2, —CF_3, —$S(O)_r$—(C1–C4-alkyl), —OH, —NH_2, —NH(C_1–C_4 alkyl), —N(C_1–C_4 alkyl$)_2$, —NHC(=O)R^4, $NHCO_2R^4$, —$(CH_2)_p$—CO_2R^4;

R^{12} is:
- a) hydrogen,
- b) C_1–C_4 alkyl,
- c) aryl,
- c) —(C_1–C_4 alkyl)-aryl, or
- d) C_5–C_7 cycloalkyl;

A is
- a) —BY^1Y^2,
- b) —C(=O)CF_3,
- c) —PO_3H_2, or
- d) —CO_2H;

W is
- a) —O—,
- b) —$S(O)_r$—,
- c) —NR^4—,
- d) —NC(=O)R^4—, or
- e) —NCO_2R^4—;

Y^1 and Y^2 are
- a) —OH,
- b) —F,
- c) —NR^4R^5,
- d) C_1–C_8 alkoxy, or when taken together Y^1 and Y^2 form a
- e) cyclic boron ester where said chain or ring contains from 2 to 20 carbon atoms and, optionally, 1–3 heteroatoms which can be N, S, or O,
- f) cyclic boron amide where said chain or ring contains from 2 to 20 carbon atoms and, optionally, 1–3 heteroatoms which can be N, S, or O,
- g) cyclic boron amide-ester where said chain or ring contains from 2 to 20 carbon atoms and, optionally, 1–3 heteroatoms which can be N, S, or O;

n is independently selected at each occurrence from 0 or 1;
p is independently selected at each occurrence from 0 to 3;
q is independently selected at each occurrence from 0 to 4;
r is independently selected at each occurrence from 0 to 2;
t is independently selected at each occurrence from 1 to 3.

5,462,965

USE OF HETEROCYCLIC AMINO-ALCOHOL COMPOUNDS FOR TREATMENT OF CNS DISEASES

Joseph L. Roba, Dion-Valmont; Claude L. Gillet, Blanmont, both of, Belgium; Michael F. Rafferty, Buffalo Grove, Ill.; Bevyn Jarrott, Diamond Creek, and Philip M. Beart, Ivanhoe, both of, Australia, assignors to GD Searle & Co., Skokie, Ill.

PCT No. PCT/US91/05028, § 371 Date Dec. 7, 1992, § 102(e) Date Dec. 7, 1992

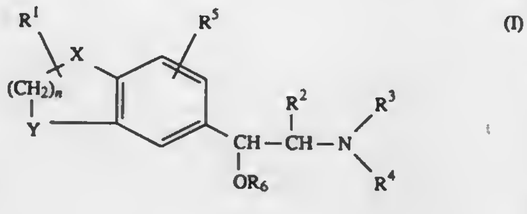
Continuation-in-part of Ser. No. 566,744, Aug. 13, 1990, abandoned. This PCT application Jul. 22, 1991, Ser. No. 949,815

Int. Cl.⁶ A61K *31/38;31/535;31/495;31/445;31/415;31/40;31/35, 31/34;31/135*

U.S. Cl. 514—443 **9 Claims**

1. A method to treat the neuropathological consequences of neurotoxic injury or neurodegenerative disease mediated by an

NMDA receptor in a subject, which method comprises administering to said subject a therapeutically-effective amount of a compound of Formula I:



(I)

wherein X is selected from oxygen atom, sulfur atom, $—CH_2—$ and —NH—;
wherein Y is selected from $—CH_2—$ and —NH—;
wherein n is a number selected from one through three, inclusive;
wherein R^1 is selected from hydrido, alkyl, hydroxyalkyl, alkoxyalkyl, cycloalkyl, cycloalkylalkyl, phenyl and carboxyl;
wherein R^2 is selected from hydrido, alkyl, hydroxyalkyl, cycloalkyl and cyctoalkylalkyl;
wherein each of R^3 and R^4 is independently selected from hydrido, alkyl, haloalkyl, cycloalkyl, cycloalkylalkyl, alkylcycloalkyl, alkylcycloalkylalkyl, phenyl, phenylalkyl, diphenylalkyl, alkylphenyl, alkylphenylalkyl, halophenyl, halophenylalkyl, phenoxyalkyl, halophenoxyalkyl, alkoxyphenoxyalkyl, cyanophenoxyalkyl, benzyloxyalkyl, alkoxyalkyl, alkoxyalkoxyalkyl, alkoxycarbonylalkyl, phenylthioalkyl, alkylcarbonylaminophenylalkyl, halophenylcarbonylalkyl, halobenzylcarbonylalkyl, alkylcarbonylphenoxyalkyl, alkoxycarbonylphenoxyalkyl, alkylphenoxyalkyl, alkenylalkyl, alkynylalkyl, alkynylalkyloxyalkyl, polycycloalkyl, saturated or partially unsaturated heterocyclic, saturated or partially unsaturated heterocyclicalkyl, heteroarylalkyl and heteroaryloxyalkyl;
wherein R^3 and R^4 may be taken together to form a saturated or partially unsaturated heterocyclic group or a heteroaryl group, either of which groups may be further substituted, said groups selected from alkylphenylpiperidinyl, morpholino, phenylmorpholino, alkylmorpholino, 1-alkyl-2-phenylmorpholino, phenylalkylpiperidinyl, phenylpiperidinyl, phenylalkylpyrrolidinyl and phenylalkylpiperazinyl;
wherein R^5 is selected from hydrido, alkyl, hydroxyalkyl, cycloalkyl, cycloalkylalkyl, phenylalkyl and phenyl;
wherein R^6 is selected from hydrido, alkanoyl and cycloalkanoyl;
and wherein any of the foregoing R^1-R^6 radicals may be further substituted at a substitutable position with a radical selected from alkyl, cycloalkyl, cycloalkylalkyl, alkoxy, alkenylalkyl, alkoxyalkyl, hydroxyalkyl, oxo, cyano, halo, phenyl and phenylalkyl;
or a pharmaceutically-acceptable salt thereof.

5,462,966

METHODS FOR THE PREVENTION AND CONTROL OF CELLULAR DAMAGE RESULTING FROM CORONARY ARTERY OCCLUSION-REPERFUSION

Robert D. Sofia, Willingboro, N.J., assignor to Carter-Wallace Inc., New York, N.Y.

Filed Oct. 15, 1993, Ser. No. 138,128

Int. Cl.⁶ A61K *31/27*

U.S. Cl. 514—483 **1 Claim**

1. A method for the reduction and control of cellular damage following coronary artery occlusion-reperfusion in human or other warm-blooded animal patients which comprises administering to said patient in need of such treatment 2-phenyl-1,3-propanediol dicarbamate.

5,462,967

FEED ADDITIVE FOR LIVESTOCK AND FEED FOR LIVESTOCK

Masaharu Hayashi, Wakayama, Japan, assignor to Kao Corporation, Tokyo, Japan

Filed Jun. 16, 1992, Ser. No. 899,315

Claims priority, application Japan, Jun. 17, 1991, 3-144654

Int. Cl.⁶ A61K *31/225;31/23;31/20*

U.S. Cl. 514—547 **8 Claims**

1. A feed additive for livestock which comprises the following components (a) and (b):

(a) a triglyceride of a medium-chain fatty acid having 6 to 12 carbon atoms; and

(b) at least one substance selected from the group consisting of a monoglyceride of a medium-chain fatty acid having 6 to 12 carbon atoms and a diglyceride of a medium-chain fatty acid having 6 to 12 carbon atoms, wherein component (a) and component (b) are present in a weight. ratio of from 10/90 to 90/10.

5,462,968

EP_2-RECEPTOR AGONISTS AS AGENTS FOR LOWERING INTRAOCULAR PRESSURE

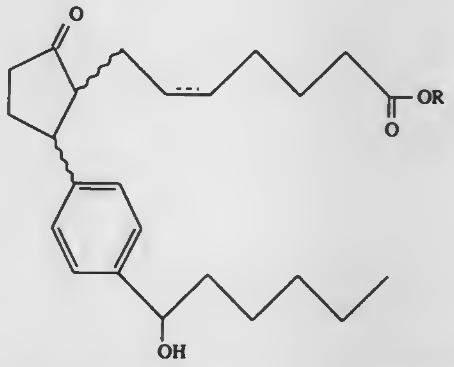
David F. Woodward, El Toro, Calif., assignor to Allergan, Inc., Irvine, Calif.

Filed Jan. 19, 1994, Ser. No. 183,682

Int. Cl.⁶ A61K *31/19*

U.S. Cl. 514—568 **3 Claims**

1. A method of treating ocular hypertension which comprises applying to the eye an amount sufficient to treat ocular hypertension of a compound of formula I



wherein the wavy bonds indicate that α or β configuration, the dashed bond represents either a single or double bond, which double bond may be a cis or trans double bond and R is hydrogen or a saturated or unsaturated acyclic hydrocarbon group having from 1 to about 20 carbon atoms, or $—(CH_2)_mR_1$ wherein m is 0–10, and R_1 is an aliphatic ring having from about 3 to about 7 carbon atoms, or phenyl.

5,462,969

METHOD AND COMPOSITIONS FOR TREATMENT OR PREVENTION OF PNEUMOCYSTIC CARINII INFECTIONS

Allen B. Clarkson, Jr., New York, N.Y., and Robert W. Grady, Kinnelon, N.J., assignors to New York University, New York, N.Y.

Division of Ser. No. 910,714, Jul. 7, 1992, Pat. No. 5,302,598, which is a division of Ser. No. 340,344, Apr. 19, 1989, Pat. No. 5,158,979. This application Feb. 4, 1994, Ser. No. 192,404

Int. Cl.^{6} A61K *31/19;31/155*

U.S. Cl. 514—575 **5 Claims**

1. A method of treating pneumonia caused by *Pneumocystis carinii* comprising administering (a) a pharmaceutically acceptable iron chelator and (b) pentamidine wherein the amounts of (a) and (b) in combination are effective in treating pneumonia caused by *Pneumocystis carinii.*

5,462,970

POLYAMINES AND ANTI-DIARRHEAL AND GASTROINTESTINAL ANTI-SPASMODIC PHARMACEUTICAL COMPOSITIONS AND METHODS OF TREATMENT

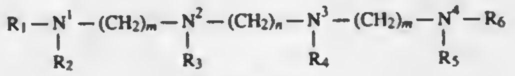
Raymond J. Bergeron, Jr., and Charles A. Sninsky, both of Gainesville, Fla., assignors to University of Florida Research Foundation, Inc., Gainesville, Fla.

Division of Ser. No. 61,707, May 17, 1993, Pat. No. 5,393,757, which is a continuation-in-part of Ser. No. 870,441, Oct. 9, 1991, abandoned, which is a continuation-in-part of Ser. No. 210,520, Jun. 23, 1988, Pat. No. 5,091,576, which is a continuation-in-part of Ser. No. 66,227, Jun. 25, 1987; abandoned, which is a continuation-in-part of Ser. No. 936,835, Dec. 2, 1986, abandoned. This application Jan. 3, 1995, Ser. No. 367,862

Int. Cl.^{6} A61K *31/135;31/13*

U.S. Cl. 514—654 **10 Claims**

1. An anti-diarrheal or gastrointestinal anti-spasmodic pharmaceutical composition comprising an effective amount of a compound having the formula:



$$R_1-\underset{R_2}{\underset{|}{N^1}}-(CH_2)_m-\underset{R_3}{\underset{|}{N^2}}-(CH_2)_n-\underset{R_4}{\underset{|}{N^3}}-(CH_2)_m-\underset{R_5}{\underset{|}{N^4}}-R_6 \qquad (I)$$

or

$$R_1-N^1H-(CH_2)_3-N^2H-(CH_2)_3-N^3H-(CH_2)_4-N^4H- \qquad (II)$$

$$-(CH_2)_3-N^5H-(CH_2)_3-N^6H-R_6$$

wherein:

R_1–R_6 may be the same or different and are alkyl of 1–5 carbon atoms or hydrocarbyl aralkyl up 12 carbon atoms;

m is an integer from 3 to 6, inclusive; and

n is an integer from 3 to 6, inclusive; or

a salt thereof with a pharmaceutically acceptable acid; and

a pharmaceutically acceptable carrier therefor.

5,462,971

PROCESS FOR TREATING POLYETHER POLYOLS

Anne M. Gaffney, West Chester, and C. Andrew Jones, Newtown Square, both of Pa., assignors to ARCO Chemical Technology, L.P., Greenville, Del.

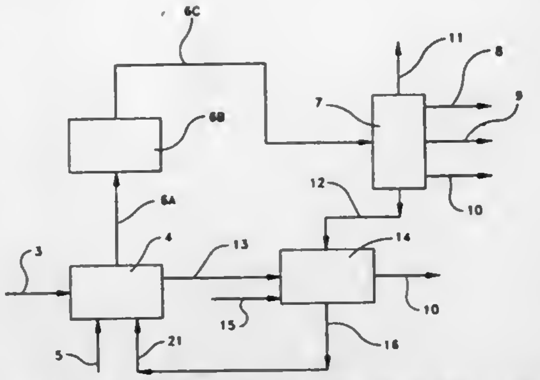
Filed Feb. 16, 1994, Ser. No. 197,039

The portion of the term of this patent subsequent to Mar. 9, 2010, has been disclaimed.

Int. Cl.^{6} C08J *11/04*

U.S. Cl. 521—40 **6 Claims**

1. A process for reclaiming a polyether polyol comprising the steps of:



a) Contacting particles of the polyether polyol and a zeolite containing particulate catalyst in a fluidized bed reaction zone at a temperature effective to produce a volatile organic component, and a spent catalyst component;

b) Withdrawing a first stream comprising the volatile organic component from the reaction zone;

c) Withdrawing a second stream comprising spent catalyst from the reaction zone; and d) Heating the second stream in a regeneration zone in the presence of oxygen at a temperature effective to regenerate the catalyst.

5,462,972

SUPERABSORBENT POLYMER HAVING IMPROVED ABSORPTION RATE AND ABSORPTION UNDER PRESSURE

Scott J. Smith, Warrenville, and Eric J. Lind, Naperville, both of Ill., assignors to Nalco Chemical Company, Naperville, Ill.

Division of Ser. No. 405,680, Mar. 17, 1995, which is a continuation-in-part of Ser. No. 181,931, Jan. 18, 1994, Pat. No. 5,399,591, which is a division of Ser. No. 123,561, Sep. 17, 1993, Pat. No. 5,314,420. This application May 18, 1995, Ser. No. 443,697

Int. Cl.^{6} C08J *9/232;9/236*

U.S. Cl. 521—53 **12 Claims**

1. A carboxylic containing superabsorbent polymer having a swell rate of at least 0.3 g./g.sec., a gel strength of about 40,000 to about 150,000 dynes/cm^2, a centrifuge capacity at 30 minutes of about 20 to about 50 g/g, an absorption permeability under pressure at 60 minutes of at least 5 g/g at wherein the ratio of the absorption permeability under pressure at 15 minutes is at least 25% of the absorption permeability under pressure at 60 minutes.

5,462,973

SEPARATION OF POLYETHYLENE TEREPHTHALATE AND POLYVINYL CHLORIDE USING SUPERCRITICAL CARBON DIOXIDE

George A. Serad, Charlotte, N.C., and Theodore S. Thornburg, Rock Hill, S.C., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Filed Jul. 13, 1994, Ser. No. 274,508

Int. Cl.^{6} C08J *9/26*

U.S. Cl. 521—62 **5 Claims**

1. A method of selectively separating a polymeric material from a mixture of co-mingled polymeric materials having similar densities consisting of the following steps:

(a) introducing said mixture of co-mingled polymeric materials into a vessel;

(b) introducing a fluid into said vessel and adjusting the temperature and pressure in said vessel above the critical point of said fluid so as to convert said fluid to a supercritical fluid if said fluid was not introduced under supercritical conditions;

(c) adjusting the temperature and pressure of the contents of the vessel so as to selectively dissolve said supercritical fluid into one of the co-mingled materials;

(d) rapidly reducing the pressure so as to reduce the fluid solubility in the selected material causing the selected material to foam and thereby have a reduced apparent density;

(e) removing the co-mingled materials from the vessel to ambient conditions with the foamed material now having a bulk density below about one;

(f) separating the foamed material from the mixture by aqueous flotation at ambient pressure.

5,462,974

EXPANDABLE COMPOSITION AND PROCESS FOR EXTRUDED THERMOPLASTIC FOAMS

Shau-Tarng Lee, Oakland, N.J., assignor to Sealed Air Corporation, Saddle Brook, N.J.

Continuation-in-part of Ser. No. 10,275, Jan. 28, 1993, Pat. No. 5,348,984. This application Sep. 19, 1994, Ser. No. 309,008

The portion of the term of this patent subsequent to Sep. 20, 2011, has been disclaimed.

Int. Cl.^{6} C08J *9/12*

U.S. Cl. 521—79 **33 Claims**

1. An extrudable, expandable composition for producing stable, low density polyolefin foam products, said composition comprising:

a) a plasticized polyolefin resin; and

b) a blowing agent for expanding the composition selected from the group consisting of ethane and a blend of carbon dioxide and a hydrocarbon selected from the group consisting of n-butane, isobutane, propane, ethane, and mixtures thereof, said hydrocarbon being present in the resin in an amount sufficient to produce a stable foam with a density of from about 20 kg/m^3 to 120 kg/m^3.

5,462,975

RUBBER COMPOSITIONS FOR SPONGE RUBBER

Keisaku Yamamoto; Kiyoshi Ikeda, and Masahiro Fukuyama, all of Chiba, Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka, Japan

Filed Nov. 14, 1994, Ser. No. 339,896

Claims priority, application Japan, Nov. 16, 1993, 5-286610; Mar. 8, 1994, 6-036831

Int. Cl.^{6} C08J *9/06*

U.S. Cl. 521—90 **16 Claims**

1. A rubber composition for sponge rubber which comprises components (A) through (E) and satisfies the requirements that the ratio by weight of (A)/(B) is 30/70 to 99/1 and the amount of component (C) is 50 to 400 parts by weight per 100 parts by weight of the total amount of components (A) and (B), wherein

(A) is an epoxy group-containing acryl elastomer,

(B) is an ethylene copolymer which contains a carboxyl group(s) or a carboxylic anhydride group(s),

(C) is at least one hydroxide of Group II or III metal in the periodic table,

(D) is a vulcanizer, and

(E) is a foaming agent.

5,462,976

PHOTOCURABLE GLYCOSAMINOGLYCAN DERIVATIVES, CROSSLINKED GLYCOSAMINOGLYCANS AND METHOD OF PRODUCTION THEREOF

Takehisa Matsuda, Osaka, Japan; Minoo J. Moghaddam, Marsfield, Australia, and Katsukiyo Sakurai, Tokyo, Japan, assignors to Seikagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 5, 1993, Ser. No. 13,799

Claims priority, application Japan, Feb. 5, 1992, 4-047744; Jul. 8, 1992, 4-203209; Dec. 21, 1992, 4-355441

Int. Cl.^{6} C08L *5/08;5/00;* **C08J** *3/28*

U.S. Cl. 522—74 **11 Claims**

1. A photocurable glycosaminoglycan derivative which comprises a glycosaminoglycan and a photoreactive compound covalently bonded to said glycosaminoglycan, wherein said glycosaminoglycan is at least one member selected from the group consisting of hyaluronic acid, chondroitin, chondroitin sulfate, dermatan sulfate, heparin, heparan sulfate, keratosulfate, keratopolysulfate and derivatives thereof, said photoreactive compound is at least one member selected from the group consisting of substituted or unsubstituted cinnamic acids and reactive derivatives thereof, uracil derivatives having a carboxyalkyl group as a substituent in position 1 and reactive derivatives thereof, and said photocurable glycosaminoglycan derivative is soluble in water and/or organic solvents and is curable by only irradiation with light.

5,462,977

PRESSURE-SENSITIVE ADHESIVE HAVING EXCELLENT HEAT-RESISTANCE, ADHESIVE SHEET USING IT, AND METHOD FOR PRODUCING THOSE

Takao Yoshikawa, and Takaaki Moriyama, both of Osaka, Japan, assignors to Nitto Denko Corporation, Osaka, Japan

Continuation of Ser. No. 969,580, Oct. 30, 1992, abandoned. This application Jan. 13, 1994, Ser. No. 181,877

Claims priority, application Japan, Jan. 31, 1991, 3-313235

Int. Cl.^{6} C08F *2/50*

U.S. Cl. 522—160 **3 Claims**

1. A method for producing a pressure-sensitive adhesive having excellent heat-resistance, which comprises irradiating a composition comprising:

a) 100 parts by weight of a monomer mixture comprising from 70 to 100% by weight of a (meth)acrylic acid alkyl ester having from 2 to 14 carbon atoms in the alkyl moiety and from 30 to 0% by weight of a monoethylenically unsaturated monomer copolymerizable with the (meth)acrylic acid alkyl ester,

b) from 0.02 to 5 parts by weight of a polyfunctional (meth-)acrylate as a crosslinking agent, and

c) from 0.01 to 4 parts by weight of a photopolymerization initiator with ultraviolet rays to form a photopolymerization product having solvent-insoluble components of at least 60% by weight, and drying the photopolymerization product by heating in the absence of a low boiling organic solvent to reduce unreacted monomers to less than 5,000 ppm and wherein said pressure-sensitive adhesive is resistant to temperatures of 100° C. to 260° C.

5,462,978

USE OF UNSATURATED SULFONIC ACID POLYMERS AS SPRAY DRYING ASSISTANTS

Erich Penzel, Ludwigshafen; Gernot Franzmann, Bobenheim; Maximilian Angel, Schifferstadt; Joachim Pakusch, Ludwigshafen, and Bernhard Schuler, Mannheim, all of, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Jun. 6, 1994, Ser. No. 254,767

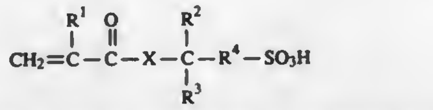
Claims priority, application Germany, Jun. 18, 1993, 43 20 220.9

Int. Cl.^{6} B01D *1/18;* **C08L** *41/00;* **C04B** *26/04*

U.S. Cl. 523—342 **13 Claims**

1. A process for spray drying aqueous polymer dispersions, comprising:

preparing a mixed polymer dispersion of at least one polymer II and at least one polymer I as a spray assistant, wherein polymer I is comprised of (a) from 15–80% by weight of at least one monomer of formula I or salts thereof:



$$CH_2{=}\overset{R^1}{C}-\overset{O}{\overset{\|}{C}}-X-\underset{R^3}{\overset{R^2}{C}}-R^4-SO_3H \qquad (I)$$

wherein R^1, R^2 and R^3 independently of one another are each hydrogen or C_{1-3} alkyl, R^4 is C_{1-5} alkylene and X is O or NH, and (b) from 20–85% by weight of at least one monomer capable of undergoing free radical copolymerization, with the proviso that the average molar solubility of the components of the mixture of all the monomers (b) polymerized at 25° C. in water is lower than the correspondingly defined average molar solubility of the components of the mixture of all the monomers (a) polymerized; and

spray drying the mixed polymer dispersion.

5,462,979

SULFUR CURED RUBBER COMPOSITION CONTAINING EPOXIDIZED NATURAL RUBBER AND CARBOXYLATED NITRILE RUBBER

Paul H. Sandstrom, Tallmadge, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Sep. 28, 1994, Ser. No. 313,954

Int. Cl.^{6} C08L *9/00;13/00;15/00;* **C08K** *3/36*

U.S. Cl. 523—438 **5 Claims**

1. A pneumatic tire having an outer circumferential tread wherein said tread comprises a sulfur cured rubber composition composed of, based on 100 parts by weight of rubber (phr);

(a) 1.0 to 15 parts by weight of epoxidized natural rubber, wherein the level of epoxidized modification is in the range of from about 15 to 85 mole percent;

(b) 1.0 to 15 parts by weight of a carboxylic acid group containing nitrile rubber;

(c) 98 to 70 parts by weight of a rubber selected from the group consisting of medium vinyl polybutadiene, styrene-butadiene rubber, synthetic cis-1,4-polyisoprene, synthetic 3,4-polyisoprene, natural rubber, cis-polybutadiene, styrene-isoprene rubber, styrene-isoprene-butadiene rubber, acrylonitrile-butadiene rubber and mixtures thereof.

5,462,980

FILM-FORMING, STARCHY, POLYMERIC COMPOSITION AND SHAPED ARTICLES, PARTICULARLY FILMS AND SHEETS, WHICH CAN BE PRODUCED FROM THE COMPOSITION AND HAVE A GOOD BARRIER EFFECT, AND A METHOD OF PRODUCING THE ARTICLES

Catia Bastioli, Novara; Vittorio Bellotti, Fontaneto d'Agogna; Gianfranco Del Tredici, Sesto Calende; Alessandro Montino, Robbio Lomellina, and Roberto Ponti, Oleggio, all of, Italy, assignors to Novamont S.p.A., Milan, Italy

Filed Mar. 5, 1993, Ser. No. 27,190

Claims priority, application Italy, Mar. 10, 1992, TO92A0199

Int. Cl.^{6} C08L *3/00;* **C08K** *5/10;5/11*

U.S. Cl. 524—47 **18 Claims**

1. A polymeric composition which can be produced from a melt comprising:

i) a starchy material component;

ii) a synthetic, thermoplastic, polymeric component; and

iii) a quantity of from 2 to 7% by weight of urea, with reference to the weight of the total composition,

wherein the starchy material includes at least 78% by weight of amylopectin.

5,462,981

METHOD OF PRODUCING PLASTICISED POLYVINYL ALCOHOL AND IT USE FOR THE PREPARATION OF STARCH-BASED, BIODEGRADABLE THERMOPLASTIC COMPOSITIONS

Catia Bastioli, Novara; Vittorio Bellotti, Fontaneto D'Agogna; Gianfranco Del Tredici, Sesto Calende, and Roberto Ponti, Oleggio, all of, Italy, assignors to Novamont S.p.A., Milan, Italy

Continuation of Ser. No. 970,078, Nov. 2, 1992, abandoned. This application Jul. 25, 1994, Ser. No. 280,150

Claims priority, application Italy, Nov. 7, 1991, TO91A0849

Int. Cl.^{6} C08L *3/02;29/04*

U.S. Cl. 524—47 **8 Claims**

1. A method of producing biodegradable polymeric blends comprising starch, at least a synthetic thermoplastic polymer, which is substantially insoluble in water, polyvinyl alcohol and plasticizer, said method comprising mixing said starch, at least a synthetic thermoplastic polymer, polyvinyl alcohol and plasticizer components in the presence of an amount of water from 5% to 40% by wt., referring to the sum of added water and water of the starch-water system, under temperature and pressure conditions such as to form a thermoplastic melt,

wherein the polyvinyl alcohol used in the mixing of said components is a pre-plasticized polyvinyl alcohol produced in the absence of said starch component according to a process comprising the steps of:

i) pre-plasticizing the polyvinyl alcohol at a maximum temperature no higher than its softening point in the presence of an organic plasticizer and in the presence of a quantity of water which is insufficient to dissolve the polyvinyl alcohol under normal conditions, so as to produce a pre-plasticized polyvinyl alcohol having a melting point below the softening point of the polyvinyl alcohol used, wherein said pre-plasticizing step is carried out:

a) under extrusion conditions at a temperature above 60° C. and not higher than 140° C., or

b) under the mixing conditions of a slow mixer, or of a turbomixer at a temperature above 20° C. and not higher than 140° C., and

ii) further processing, under extrusion conditions, the pre-plasticized polyvinyl alcohol of step i) at a temperature above its melting point under shear-stress conditions and for a period of time which is sufficient to produce a substantially homogeneous melt.

5,462,982

METHOD FOR THE PREPARATION OF DESTRUCTURED-STARCH-BASED COMPOSITIONS AND COMPOSITIONS PRODUCED THEREBY

Catia Bastioli; Roberto Lombi, both of Novara; Gianfranco Del Tredici, Sesto Calende, and Italo Guanella, Romentino, all of, Italy, assignors to Novamont S.p.A., Milan, Italy

Continuation of Ser. No. 71,939, Jun. 3, 1993, abandoned, which is a continuation of Ser. No. 821,251, Jan. 10, 1992, abandoned, which is a continuation of Ser. No. 530,916, May 30, 1990, abandoned. This application Oct. 28, 1994, Ser. No. 331,338

Claims priority, application Italy, May 30, 1989, 67414 A/89

Int. Cl.^{6} C08L *3/02*

U.S. Cl. 524—47 **7 Claims**

1. A method for the preparation of a destructured-starch-based composition usable for the production of articles of biodegradable plastics material comprising mixing in the absence of added water in a heated extruder starch that is not dried beforehand, a high-boiling plasticizer wherein the quantity of high-boiling plasticizer is from 20 to 100% of the weight of the starch, and a urea destructuring agent for a time sufficient to bring about destructuring of the starch and at a temperature below the boiling point of the plasticizer and between 120° and 170° C.

5,462,983

BIODEGRADABLE MOLDABLE PRODUCTS AND FILMS COMPRISING BLENDS OF STARCH ESTERS AND POLYESTERS

Steven Bloembergen, South Lyon, and Ramani Narayan, Okemos, both of Mich., assignors to Evercorn, Inc., Lansing, Mich.

Filed Jul. 27, 1993, Ser. No. 97,563

Int. Cl.^{6} C08L *67/02;67/04*

U.S. Cl. 524—51 **13 Claims**

1. A biodegradable moldable product or film product prepared from a compatible blend comprising a biodegradable, hydrophobic, water repellant, amorphous, starch ester having a degree of substitution of about 1.0 to about 2.5 DS and a biodegradable polyester selected from the class consisting of poly (ϵ-caprolactone) (PCL), poly(lactic acid) or polylactide (PLA), poly(glycolic acid) or polyglycolide (PGA), bacterial and synthetic poly(β-hydroxybutyrate-co-β-hydroxyvalerate) (PHB/V) and poly(β-hydroxyalkanoates) (PHA).

5,462,984

SOLID BLENDS OF STABILIZERS FOR POLYMERS

Carlo Neri, San Donato Milanese; Silvestro Costanzi, Lodi Vecchio, and Mariangela Angaroni, Gerenzano, all of, Italy, assignors to Enichem Synthesis S.p.A., Milan, Italy

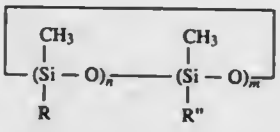
Continuation of Ser. No. 72,270, Jun. 3, 1993, abandoned. This application Feb. 24, 1995, Ser. No. 394,195

Claims priority, application Italy, Jun. 4, 1992, MI92A1376

Int. Cl.^{6} C08K *5/3435*

U.S. Cl. 524—102 **14 Claims**

1. A solid stabilizer for polymers which comprises a blend of (a) 60 to 10% by weight of an organic polymer and (b) 40 to 90% by weight, based on the final solid blend, of a mixture of a cyclic silicon-containing compound and a linear silicon-containing compound as a stabilizer; with the cyclic compound having the formula (I) and the linear compound having the formula (II):



(I)

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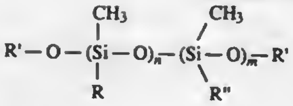
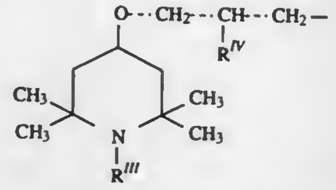


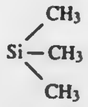
(II)

$$R'-O-(\underset{R}{\overset{CH_3}{Si}}-O)_n-(\underset{R''}{\overset{CH_3}{Si}}-O)_m-R'$$

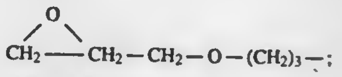
where R is:



with R''' being a hydrogen atom or a methyl group, R^{IV} being a hydrogen atom or a C_1–C_5 linear or branched alkyl group; where R' is a hydrogen atom, a

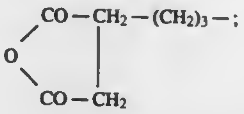


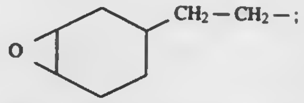
group of a C_1–C_{12} linear or branched alkyl group; where R" is a C_1–C_{18} linear or branched alkyl group, or is selected from the group consisting of:



$H_2N-(CH_2)_3-$;

$H_2N-(CH_2)_3-NH-(CH_2)_3-$;





where the total of m+n is between 4 and 50; and where m is 0 or an integer between 1 and 15.

5,462,985

MATTE ELECTRODEPOSITABLE COATING COMPOSITION AND PROCESS FOR PREPARING THE SAME

Toshiaki Takei; Satoshi Kayamori, and Hiroyuki Ota, all of Aichi, Japan, assignors to Taogosei Co., Ltd., Tokyo, Japan

Filed Dec. 29, 1994, Ser. No. 366,301

Claims priority, application Japan, Dec. 29, 1993, 5-350375

Int. Cl.^{6} C08K *5/00*

U.S. Cl. 524—204 **11 Claims**

6. A process for preparing a matte electrodepositable coating composition, said process comprising the steps of:

mixing a first mixture comprising a fluorine-containing resin and an acrylic resin dissolved in a water-miscible organic solvent with a second mixture comprising an aluminum complex compound represented by formula (1) or (2):

$$Al(OR^1)(OR^2)(L) \quad (1)$$

$$Al(L^1)(L^2)(L^3) \quad (2)$$

wherein R^1 and R^2 each independently represents an alkyl group; and L, L^1, L^2, and L^3 each independently represent a keto-enol tautomeric compound, and an amino resin to prepare a third mixture; and

mixing said third mixture with an aqueous medium to obtain a fourth mixture,

wherein an alkaline substance is incorporated in at least one of said fluorine-containing resin, said acrylic resin, said amino resin, said aluminum complex compound, said first mixture, said second mixture, and said third mixture, to provide said fourth mixture with water solubility or water dispersibility.

5,462,986

DECYL ALCOHOL MIXTURES, PHTHALIC ESTERS OBTAINABLE THEREFROM AND THEIR USE AS PLACTICIZERS

Helmut Bahrmann, Hamminkeln; Wolfgana Greb, Dinslaken; Peter Heymanns, Essen; Peter Lappe; Thomas Müller, both of Dinslaken; Jürgen Szameitat, Wesel, and Ernst Wiebus, Oberhausen, all of, Germany, assignors to Hoechst Aktiengesellschaft, Germany

Division of Ser. No. 311,561, Sep. 23, 1994. This application Feb. 14, 1995, Ser. No. 388,238

Claims priority, application Germany, Sep. 30, 1993, 43 33 324.9

Int. Cl.⁶ C08K *5/09;* **C07C** *69/76*

U.S. Cl. 524—296 **17 Claims**

1. An ester mixture comprising products of the reaction of phthalic acid or phthalic anhydride, with an alcohol mixture of isomeric decyl alcohols which is the product of hydroformylation of an olefinic mixture containing butene-1 and butene-2, said hydroformylation being carried out in a first stage and a second stage,

said first stage comprising a first hydroformylation of said olefinic mixture in a heterogeneous reaction system at a first temperature of 70° to 150° C. and under a first pressure of 0.4 to 30 MPa, in the presence of an aqueous solution of a first catalyst, said first catalyst comprising at least one rhodium compound and at least one water-soluble phosphine, to form a first reaction mixture containing a first aldehyde mixture,

separation of said first aldehyde mixture from said first reaction mixture leaving a residue which contains butene-2,

said second stage comprising a second hydroformylation of said residue in a homogeneous reaction system at a second temperature of 130° to 180° C. and under a second pressure of 8 to 30 MPa, in the presence of a cobalt catalyst, to form a second reaction mixture containing a second aldehyde mixture, said second aldehyde mixture being separated from said second reaction mixture, and combined with said first aldehyde mixture to form a combined aldehyde mixture, condensed to form a third reaction mixture containing an aldol mixture, separation of said aldol mixture from said third reaction mixture, and hydrogenation of said aldol mixture forming said alcohol mixture.

9. A plasticizer comprising a phthalate ester of an alcohol mixture of isomeric decyl alcohols which alcohol mixture is the product of hydroformylation of an olefinic mixture containing butene-1 and butene-2, said hydroformylation being carried out in a first stage and a second stage,

said first stage comprising a first hydroformylation of said olefin mixture in a heterogeneous reaction system at a first temperature of 70° to 150° C. and under a first pressure of 0.4 to 30 MPa in the presence of an aqueous solution of a first catalyst, said first catalyst comprising at least one rhodium compound and at least one water-soluble phosphine, to form a first reaction mixture containing a first aldehyde mixture,

separation of said first aldehyde mixture from said first reaction mixture leaving a residue which contains butene-2,

said second stage comprising a second hydroformylation of said residue in a homogeneous reaction system at a second temperature of 130° to 180° C. and under a second pressure of 8 to 30 MPa in the presence of a cobalt catalyst to form a second reaction mixture containing a second aldehyde mixture,

said second aldehyde mixture being separated from said second reaction mixture, and combined with said first aldehyde mixture to form a combined aldehyde mixture, said combined aldehyde mixture being condensed to form a third reaction mixture containing an aldol mixture, separation of said aldol mixture from said third reaction mixture, and hydrogenation of said aldol mixture forming said alcohol mixture.

17. A method of plasticizing a resin comprising mixing therewith the plasticizer of claim 9.

5,462,987

POLYPROPYLENE RESIN COMPOSITION HAVING AN IMPROVED COMPATIBILITY WITH PAINT-COATINGS AND A PAINT-COATED ARTICLE THEREOF

Hideo Shinonaga, Chiba, and Satoru Sogabe, Sodegaura, both of, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Dec. 3, 1993, Ser. No. 161,274

Claims priority, application Japan, Dec. 8, 1992, 4-327733; Sep. 13, 1993, 5-227491

Int. Cl.⁶ C08L *53/00;* **C08K** *3/00*

U.S. Cl. 524—451 **4 Claims**

1. A polypropylene composition which comprises:

(A) 60–95 parts by weight of a crystalline polypropylene, which is a propylene-ethylene block copolymer containing ethylene-propylene random copolymer units and crystalline polypropylene homopolymer units wherein an amount of said ethylene-propylene random copolymer units is 5 to 20% by weight relative to the total weight of the propylene-ethylene block copolymer, an ethylene content in the ethylene-propylene random copolymer units is 20 to 60% by weight, and the crystalline polypropylene homopolymer units have an intrinsic viscosity measured with tetralin solution at 135° C. of 0.8 to 2.0 dl/g, a Q value measured by GPC of 3.0 to 5.0 and a content of xylene-soluble portion at 20° C. of not more than 1.5% by weight,

(B) 5–40 parts by weight of an ethylene-propylene random copolymer rubber containing 10–70 wt % of propylene and having a Mooney viscosity, ML_{1+4} 100° C., of 10–100, the mixture of (A) and (b) being 100 parts by weight

(C) 1–15 parts by weight, per 100 parts by weight of the mixture of said crystalline polypropylene and ethylene-propylene copolymer rubber, of a hydroxyl group-containing propylene oligomer having a number-average molecular weight of 2,000–20,000 and a hydroxyl value of 10–6 and

(D) an inorganic filler in an amount of up to 40 parts by weight per 100 parts by weight of the mixture of said crystalline polypropylene and ethylene-propylene copolymer rubber.

5,462,988

SILICONE COPOLYMER EMULSION

Yukio Doi, Ibo; Wei-Zhong Zhang, Tatuno; Koichi Ishitani, Tatuno, and Masayoshi Kinugasa, Tatuno, all of, Japan, assignors to Showa Highpolymer Co., Ltd., Tokyo, Japan

Filed Apr. 14, 1994, Ser. No. 227,339

Claims priority, application Japan, Apr. 16, 1993, 5-114139

Int. Cl.⁶ C08J *3/02;* **C08L** *43/04*

U.S. Cl. 524—501 **4 Claims**

1. A silicone copolymer emulsion comprising:

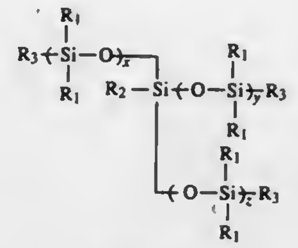
(A) 10 to 90 wt % based on (A) of a silicone component containing

(i) 5 to 60 wt % based on (A) of compound (a) and

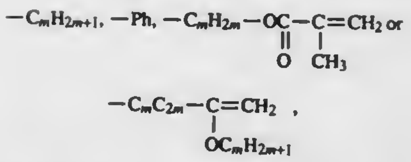
(ii) 95 to 40 total wt % of compound (b) and compound (c);

(B) 90 to 10 wt % of a copolymerizable monomer; and,

(C) a platinum compound or an organic tin compound as a catalyst, said compound (a) being expressed by the following formula (1):

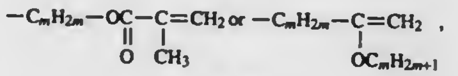

(1)

wherein R_1 denotes

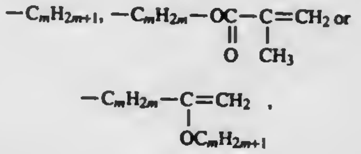

$$-C_mH_{2m+1},\ -Ph,\ -C_mH_{2m}-\underset{\underset{O}{\|}}{C}{O}-\underset{\underset{CH_3}{|}}{C}=CH_2 \text{ or } -C_mC_{2m}-\underset{\underset{OC_mH_{2m+1}}{|}}{C}=CH_2\ ,$$

Ph denotes a phenyl group or an alkyl substituted phenyl group,

R_2 denotes

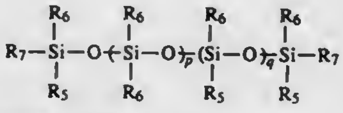

$$-C_mH_{2m}-O\underset{\underset{O}{\|}}{C}-\underset{\underset{CH_3}{|}}{C}=CH_2 \text{ or } -C_mH_{2m}-\underset{\underset{OC_mH_{2m+1}}{|}}{C}=CH_2\ ,$$

R_3 denotes


$$-C_mH_{2m+1},\ -C_mH_{2m}-O\underset{\underset{O}{\|}}{C}-\underset{\underset{CH_3}{|}}{C}=CH_2 \text{ or } -C_mH_{2m}-\underset{\underset{OC_mH_{2m+1}}{|}}{C}=CH_2\ ,$$

m denotes 0 to 10; x: 0 to 150; y: 0 to 150; and, z: 0 to 150, and, x+y+z=5 to 150

said compound (b) being expressed by the following formula (2)


(2)
$$R_7-\underset{\underset{R_5}{|}}{\overset{\overset{R_6}{|}}{Si}}-O(\underset{\underset{R_6}{|}}{\overset{\overset{R_6}{|}}{Si}}-O)_p(\underset{\underset{R_5}{|}}{\overset{\overset{R_6}{|}}{Si}}-O)_q\underset{\underset{R_5}{|}}{\overset{\overset{R_6}{|}}{Si}}-R_7$$

wherein R_5 denotes —H or —OCH_3;

R_6: —C_mH_{2m+1};

R_7: —H, —OCH_3 or —C_mH_{2m+1};

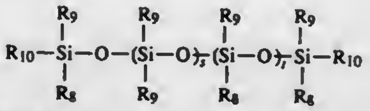
where m denotes 1 to 10;

p: 0 to 560;

q: 0 to 560; and,

p+q=10 to 560

said compound (c) being expressed by the following formula (3)


(3)
$$R_{10}-\underset{\underset{R_8}{|}}{\overset{\overset{R_9}{|}}{Si}}-O-(\underset{\underset{R_9}{|}}{\overset{\overset{R_9}{|}}{Si}}-O)_s(\underset{\underset{R_8}{|}}{\overset{\overset{R_9}{|}}{Si}}-O)_t\underset{\underset{R_8}{|}}{\overset{\overset{R_9}{|}}{Si}}-R_{10}$$

where R_8 denotes —$C_{m-1}H_{2(m-1)}$—$CH{=}CH_2$ or —OH;

R_9: —C_mH_{2m+1};

R_{10}: —$C_{m-1}H_{2(m-1)}$—$CH{=}CH_2$, —OH or —C_mH_{2m+1};

where m denotes 1 to 10

s: 0 to 560;

t: 0 to 560; and,

s+t=10 to 560.

5,462,989

FIBER OPTIC POTASSIUM ION SENSOR

Ganapati R. Mauze, 1114 W. Knickerbocker Dr., Sunnyvale, Calif. 94087, and Lothar Rupp, Kirchstr. 2, D-7209 Aixheim, Germany

Division of Ser. No. 610,289, Nov. 7, 1990, Pat. No. 5,154,890. This application Jul. 22, 1992, Ser. No. 918,486

Int. Cl.^{6} C08K *5/39;5/49;* C07D *323/00;321/00*

U.S. Cl. 524—707 **5 Claims**

1. A process for immobilizing a molecule having a fluorophore thereon on a hydrophilic polymer, said molecule comprising an ionophore having selectivity substantially limited to potassium ions, said ionophore selected from the group consisting of 2,2-bis[3,4-(15-crown-5)-2-nitrophenylcarboxymethyl]tetradecane, Val-inomycin, 18Crown-6, and derivatives thereof, and said fluorohore selected from the group consisting of Rhodamine-B, Rhodamine-110, Fluorescein, and 2,7'-dichlorofluoroscein, comprising forming a solution of said molecule in a monomer and initiating a polymerization reaction to form a gel comprising said hydrophilic polymer.

5,462,990

MULTIFUNCTIONAL ORGANIC POLYMERS

Jeffrey A. Hubbell; Donald Elbert; Jennifer L. Hill-West; Paul D. Drumheller, all of Austin; Sanghamitra Chowdhury, Round Rock, all of Tex., and Amarpreet Sawhney, Newton, Mass., assignors to Board of Regents, The University of Texas System, Austin, Tex.

Continuation-in-part of Ser. No. 740,703, Aug. 5, 1991, which is a division of Ser. No. 598,880, Oct. 15, 1990, Pat. No. 5,232,984. This application Oct. 5, 1993, Ser. No. 132,507

Int. Cl.^{6} C08L *1/00*

U.S. Cl. 525—54.1 **18 Claims**

1. A biocompatible polymeric material selected from the group consisting of block copolymers having the formulas (A)x-(B)y where the polymer is a brush copolymer having bristles of poly(A), (A)x(B)y, (A)x(B)y(A)z, and (B)x(A)y(B)z wherein

(A)x, (A)y and (A)z are biocompatible synthetic polymers and mixtures of polymers that form a region which is polynonionic at a pH of between 6.5 and 8.5 and does not bind tissue, and

(B)y, (B)x, and (B)z are biocompatible, water-soluble synthetic polymers or mixture of polymers that form a region which is polycationic at a pH of between 6.5 and 8.5 and binds to tissue; and wherein

x is an integer of greater than or equal to 5, y is an integer of greater than or equal to 3 and z is an integer of greater than or equal to 0,

wherein the polymer has a molecular weight of at least 300 g/mole,

in combination with a pharmaceutically acceptable carrier for administration to a patient.

5,462,991

IMMOBILIZATION OF PH-SENSITIVE DYES TO SOLID SUPPORTS

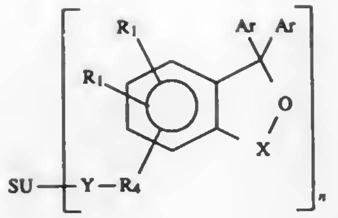
Karla M. Robotti, 1008 Gull Ave., Foster City, Calif. 94404, and Carl A. Myerholtz, 18644 Loree Ave., Cupertino, Calif. 95014

Division of Ser. No. 718,062, Jun. 20, 1991, Pat. No. 5,384,411. This application Aug. 22, 1994, Ser. No. 293,870

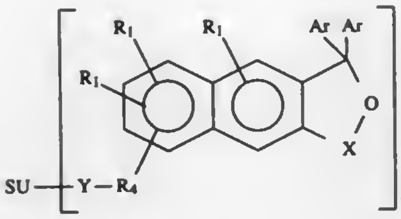
Int. Cl.^{6} C07D *327/01;307/78;307/92*

U.S. Cl. 525—54.3 **19 Claims**

1. A solid support having one or more dye substituents attached thereto which support is represented by formula IV, V or VI:

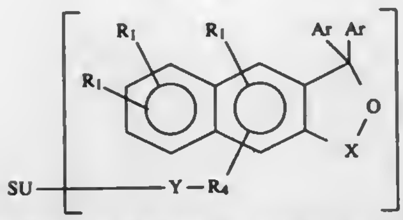


IV



V

and



VI

wherein each R_1 is independently hydrogen or a compatible substituent selected from the group consisting of hydrogen, alkyl groups of from 1 to 6 carbon atoms, and alkoxy groups of from 1 to 6 carbon atoms; R_4 is a covalent bond or a compatible linker group selected from the group consisting of hydrocarbyl groups and carbonylhydrocarbyl groups; SU is a solid support; Y is the residue of the reactive functionality attached to R_4 selected from the group consisting of carboxylic acid groups, amine groups, hydroxyl groups, unsaturted aliphatic groups and epoxides and which forms a stable covalent bond with the solid support; each Ar is independently a 4-hydroxyphenyl or 4-hydroxynaphthyl group having from 0 to 3 compatible substituents selected from the group consisting of alkyl of from 1 to 6 carbon atoms, halo and nitro and n is an integer equal to at least 1.

5,462,992

ACETOACETYLATED POLYMERS CROSSLINKED WITH CARBAMYLMETHYLAMINOTRIAZINES

Truman F. Wilt, Clinton; Deborah E. Hayes, Penn Hills Borough; Charles R. Krepley, Washington Township, and Daniel E. Rardon, Squirrel Hill, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Mar. 31, 1995, Ser. No. 414,159
Int. Cl.^{6} C08F *8/32*

U.S. Cl. 525—176 **27 Claims**

1. A curable coating composition comprising:

(a) an acetoacetylated polymer, and

(b) a triazine compound selected from the group consisting of:

(i) triaminotriazine compounds of the formula

$$C_3N_6(CH_2OR)_{6-x}(CH_2NHCOOR')_x,$$

(ii) benzoguanamine compounds of the formula

$$C_3N_5(C_6H_5)(CH_2OR)_{4-y}(CH_2NHCOOR')_y,$$

(iii) oligomers of (i) or of (ii), and

(iv) mixtures of at least two of any of (i), (ii) and (iii),

wherein the R and R' groups are, independently, radicals derived from monoalkyl ethers of alkylene glycols having at least 4 carbon atoms and monoaryl ethers of alkylene glycols having at least 8 carbon atoms, alone or combined with alkyl groups having from 1 to 20 carbon atoms, where x is in the range of from 2 to 6, and where y is in the range of from 2 to 4.

5,462,993

RUBBERY POLYMER

Hung D. Ngoc, Limeil Brevannes, and Mariano Salazar, Orsay, both of, France, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 306,291, Sep. 15, 1994, Pat. No. 5,415,940, which is a division of Ser. No. 43,076, Apr. 5, 1993, Pat. No. 5,380,785. This application May 15, 1995, Ser. No. 440,593
Int. Cl.^{6} C08F *267/06*

U.S. Cl. 525—274 **17 Claims**

1. A rubbery polymer which can be blended with polyvinyl chloride to make leathery compositions having good heat and ultraviolet light resistance, said rubber polymer being comprised of repeat units which are comprised of (a) butyl acrylate, (b) at least one member selected from the group consisting of methyl methacrylate, ethyl methacrylate, methyl acrylate, and ethyl acrylate, (c) acrylonitrile, (d) styrene, (e) a half ester maleate soap, and (f) a crosslinking agent.

5,462,994

PREPARATION OF CONJUGATED DIENE-MONOALKENYL ARENE BLOCK COPOLYMERS HAVING A LOW POLYDISPERSITY INDEX

Grace Y. Lo, and Arnold L. Gatzke, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 27, 1994, Ser. No. 187,583
Int. Cl.^{6} C08F *297/04*

U.S. Cl. 525—314 **22 Claims**

1. A process for the preparation of a block copolymer which corresponds to the formula ABA wherein A comprises units derived from one or more monoalkenyl arenes; and B comprises units derived from one or more conjugated dienes and the residuum of a difunctional initiator; wherein the process comprises:

I) contacting (a) a difunctional initiator capable of initiating the polymerization of a compound containing a double bond with (b) a conjugated diene in an aliphatic or cycloaliphatic hydrocarbon solvent wherein the concentration of difunctional initiator is from about 0.002 moles/liter to about 0.06 moles/liter and the molar ratio of conjugated diene to difunctional initiator is from about 30:1 to about 1000:1 under conditions such that the conjugated diene polymerizes to a degree of polymerization of 30 or greater wherein the difunctional initiator is soluble in the solvent;

II) contacting with the polymerization mixture of I a sufficient amount of conjugated diene to prepare a polymer having a number average molecular weight of from about 30,000 to about 300,000 and an aliphatic or cycloaliphatic hydrocarbon solvent such that the mixture has a solids content of from about 5 to about 30 percent by weight, under conditions such that the added conjugated diene polymerizes; and

III) contacting with the polymerization mixture of II a sufficient amount of monoalkenyl arene monomer to prepare a triblock copolymer having a number average molecular weight of about 31,500 to about 400,000 and an average weight percent of monoalkenyl arene contained in the block copolymer of, from about 5 percent to about 50 percent by weight under conditions such that the monoalkenyl arene polymerizes.

5,462,995

HYDROGENATED PRODUCTS OF THERMOPLASTIC NORBORNENE POLYMERS, THEIR PRODUCTION, SUBSTRATES FOR OPTICAL ELEMENTS OBTAINED BY MOLDING THEM, OPTICAL ELEMENTS AND LENSES

Tohru Hosaka; Hideharu Mizuno; Yuji Koushima, all of Yokohama; Teiji Kohara, Kawasaki, and Tadao Natsuume, Yokosuka, all of, Japan, assignors to Nippon Zeon Co., Ltd., Tokyo, Japan

PCT No. PCT/JP92/00737, § 371 Date Nov. 16, 1993, § 102(e) Date Nov. 16, 1993, PCT Pub. No. WO92/22590, PCT Pub. Date Dec. 23, 1992

PCT Filed Jun. 9, 1992, Ser. No. 146,101

Claims priority, application Japan, Jun. 11, 1991, 3-165170; Aug. 12, 1991, 3-225290

Int. Cl.^{6} B32B *3/00;* **C08F** *32/00*

U.S. Cl. 525—332.1 **15 Claims**

1. The hydrogenated product of a thermoplastic norbornene polymer of which the content of any transition metal atom originating from the polymerization catalyst is 1 ppm or less.

5,462,996

THERMOPLASTIC POLYMER PARTICLES IN LIQUID THERMOSETTABLE RESIN

Gene B. Portelli, Woodbury; William J. Schultz, Vadnais Heights; John T. Boden, White Bear Lake, and Daniel M. Kaufer, Scandia, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 269,825, Jul. 1, 1994, Pat. No. 5,405,686, which is a division of Ser. No. 147,638, Nov. 4, 1993, Pat. No. 5,368,922, which is a division of Ser. No. 808,019, Dec. 13, 1991, Pat. No. 5,276,106, which is a continuation-in-part of Ser. No. 596,796, Oct. 12, 1990, Pat. No. 5,067,564, which is a continuation-in-part of Ser. No. 467,729, Jan. 19, 1990, abandoned. This application Feb. 6, 1995, Ser. No. 383,872

Int. Cl.^{6} C08L *63/02;67/02;77/06;81/06*

U.S. Cl. 525—423 **20 Claims**

1. A process for preparing a hot melt coatable thermosettable resin composition comprising the steps of:

providing an admixture comprising

a) a thermosettable mixture that is liquid at a temperature in the range of 20° to 100° C. comprising one or more thermosettable resins and one or more curatives for the thermosettable resins and

b) resin particles of one or more amorphous thermoplastic polymers, said particles being dispersed in the thermosettable mixture at a temperature below the dissolution temperature of the particles, the particles having an average diameter in the range of 0.5 to 50 micrometers, a surface area of at least 1.0 m^2/g, and a dissolution temperature of 50° C., or higher and being essentially insoluble in the thermosettable resin at temperatures up to 15° C. below the dissolution temperature; said resin composition being free of solvent for the thermoplastic particles and having a viscosity that decreases with increasing temperature up to a dissolution temperature and that increases with increasing temperatures at temperatures above the dissolution temperature, said amorphous particles being capable of completely dissolving in the thermosettable resin at a temperature at least 20° C. below the cure temperature of the resin, and being capable of providing a homogeneous cured resin composition.

5,462,997

POLYHYDRIC PHENOL, AND EPOXY RESIN AND EPOXY RESIN COMPOSITION DERIVED THEREFROM

Noriaki Saito; Takashi Morimoto; Kazuo Takebe; Yutaka Shiomi, all of Tsukuba; Shigeki Naitoh, Tokyo, and Shuichi Kanagawa, Tsukuba, all of, Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka, Japan

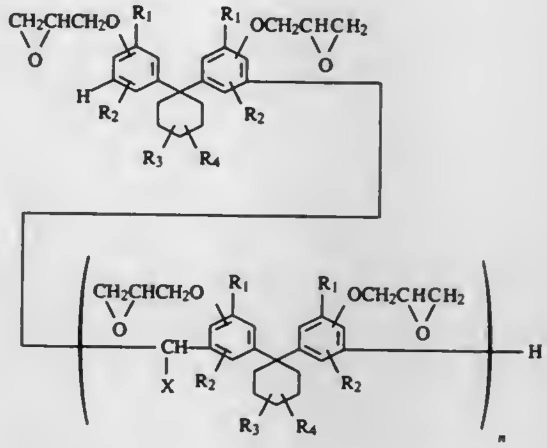
Division of Ser. No. 155,181, Nov. 22, 1993, Pat. No. 5,395,912, which is a continuation of Ser. No. 957,875, Oct. 8, 1992, abandoned. This application Oct. 27, 1994, Ser. No. 328,771

Claims priority, application Japan, Jan. 9, 1991, 3-261898

Int. Cl.^{6} C08G *8/36;59/08;* **C08L** *63/04*

U.S. Cl. 525—507 **11 Claims**

1. An epoxy resin composition comprising (a) an epoxy resin represented by the general formula (2)



wherein R$_1$ to R$_4$ independently represent hydrogen, an alkyl or cycloalkyl group having 1 to 9 carbon atoms, or halogen, and X represents hydrogen, an alkyl group having 1 to 9 carbon atoms, or an aryl and n represents an average number of repeating units of 0.1 to 1.6; and a curing agent.

5,462,998

VINYL CHLORIDE POLYMERIZATION PROCESS USING BALL VALVES IN RECYCLE LINE

Yoichi Tanifuji, Matsudo, and Yasuhiro Yamamoto, Ibaraki, both of, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Aug. 3, 1994, Ser. No. 285,297

Claims priority, application Japan, Aug. 3, 1993, 5-210936

Int. Cl.^{6} C08F *14/06*

U.S. Cl. 526—67 **2 Claims**

1. A method of producing a polymer comprising the step of suspension polymerizing or emulsion polymerizing vinyl chloride or a mixture of vinyl chloride and other vinyl monomer containing at least 50% by weight of vinyl chloride using a polymerization apparatus comprising a circuit comprised of a polymerization vessel, a heat exchanger placed outside said polymerization vessel, and a circulation pipeline extending from said polymerization vessel and returning to said polymerization vessel through said heat exchanger, a branch pipeline being connected to said circulation pipeline through a ball valve comprising a spherical valve element and a valve body for housing said spherical valve element, wherein the valve body of said ball valve is joined directly to said circulation pipeline, and the distance between a line passing through the lowest point on said circulation pipeline and a line passing through the lowest point in the dead space between the valve body housing the spherical valve element and the circulation pipeline is ≦¼ the inner diameter of the circulation pipeline.

5,462,999

PROCESS FOR POLYMERIZING MONOMERS IN FLUIDIZED BEDS

John R. Griffin, Baytown; Marc L. DeChellis, Houston, and Michael E. Muhle, Kingwood, all of Tex., assignors to Exxon Chemical Patents Inc., Wilmington, Del.

Continuation-in-part of Ser. No. 216,520, Mar. 22, 1994, Pat. No. 5,405,922, which is a continuation of Ser. No. 65,250, May 20, 1993, abandoned, and a continuation of Ser. No. 53,067, Apr. 26, 1993, Pat. No. 5,352,749. This application Oct. 3, 1994, Ser. No. 316,769

The portion of the term of this patent subsequent to Apr. 11, 2012, has been disclaimed.

Int. Cl.^{6} C08F *2/34*

U.S. Cl. 526—68 55 Claims

1. A process for polymerizing alpha-olefin(s) in the presence of a supported metallocene catalyst in a gas phase reactor having a fluidized bed and a fluidizing medium wherein the fluidizing medium serves to control the cooling capacity of said reactor, the process comprising employing in the fluidizing medium a level of liquid entering the reactor which is greater than 2 to 50 weight percent based on the total weight of the fluidizing medium wherein the bulk density function (Z) is maintained at a value equal to or greater than the calculated limit of the bulk density function.

5,463,000

PROCESS FOR PRODUCING OLEFIN POLYMERS

Yoshihiro Miyoshi, Chiba; Hiroyuki Shiraishi, Sodegaura; Kiyoshi Kawai, Chiba, and Hideaki Koga, Ichihara, all of, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Oct. 27, 1992, Ser. No. 966,850

Claims priority, application Japan, Jan. 29, 1991, 3-282556

Int. Cl.^{6} C08F *4/656*

U.S. Cl. 526—119 19 Claims

1. A process for producing an olefin polymer which comprises homopolymerizing ethylene or copolymerizing ethylene and an α olefin in a gas phase using a catalyst system comprising the following components A) and B):

A) a solid catalyst component prepared by impregnating a catalyst component into a porous polymer material which is a trivalent titanium-containing solid catalyst component represented by the following composition formula:

$$Mg_mTi(OR)_nX_p(ED)_q$$

wherein R is a hydrocarbon group having 1–20 carbon atoms, X is a halogen, ED is an electron-donative compound, and m, n, p and q are numbers satisfying $1 \leqq m \leqq 51$, $0 \leqq n \leqq 5$, $5 \leqq p \leqq 106$ and $0.2 \leqq q \leqq 2$, respectively, said solid catalyst component being prepared by reducing a titanium compound represented by the following formula:

$$Ti(OR^1)_aX_{4-a}$$

wherein R^1 is a hydrocarbon group having 1–20 carbon atoms, X is a halogen atom and a is a number satisfying $0 < a \leqq 4$, with an organomagnesium compound in the presence of an organic silicon compound having Si—O bond and a porous polymer to obtain a solid product, treating the solid product with an ester compound, and then reacting the treated product with titanium tetrachloride or a mixture of titanium tetrachloride and an electron-donative compound, said solid catalyst component satisfying the following conditions (a), (b) and (c):

(a) ethylene is preliminarily polymerized thereon in an amount of 50–200 g per gram of the component previously impregnated into the porous polymer material,

(b) the preliminary polymerization of ethylene is carried out at most at a rate of 3 g/g-impregnated component•hour at least until the quantity of the preliminarily polymerized ethylene reaches 5 g/g-impregnated component, and

(c) the preliminarily polymerized ethylene polymer has an intrinsic viscosity [η] of 0.5 dl/g to 2.5 dl/g as measured in tetralin at 135° C.; and

(B) an organoaluminum compound.

5,463,001

PROCESS FOR PREPARING POLYOLEFINS

Akira Sano; Takeichi Shiraishi, both of Kawasaki; Kunihiro Suzuki, Yokohama; Mitsuo Okamoto, Yokohama; Katumi Usui, Yokohama; Hiroyuki Shimizu, and Kazuo Matsuura, both of Tokyo, all of, Japan, assignors to Nippon Oil Company, Limited, Tokyo, Japan

Continuation of Ser. No. 661,910, Feb. 27, 1991, abandoned. This application Jan. 21, 1993, Ser. No. 6,695

Claims priority, application Japan, Mar. 2, 1990, 2-50823

Int. Cl.^{6} C08F *4/656*

U.S. Cl. 526—124.5 12 Claims

1. A process for preparing a polyolefin by polymerizing or copolymerizing an olefin or olefins in the presence of a catalyst comprising a solid catalyst component and an organometallic compound, said solid catalyst component being prepared by the reaction of the following components (I) and (II):

(I) a reaction product obtained by reacting the following components (1), (2) and (3) with one another in the presence of a compound represented by the general formula ROH wherein R is an organic radical having 1 to 20 carbon atoms or a hydrocarbon radical containing a heteroatom selected from the group consisting of oxygen, nitrogen, sulfur, and chlorine:

(1) a silicon oxide and/or an aluminum oxide;

(2) a reaction product obtained by the reaction of a magnesium halide and compound represented by the general formula $Me(OR)_nX_{z-n}$ wherein Me represents an element of Groups I to IV in the Periodic Table, z represents the valence of the element Me, n is $0n \leqq z$, X is a halogen atom, and R is a hydrocarbon radical having 1 to 20 carbon atoms; and

(3) a titanium compound represented by the general formula $Ti(OR)_nX_{4-n}$ wherein R is a hydrocarbon radical having 1 to 20 carbon atoms, Z is a halogen atom, and n is $2 < n \leqq 4$; and

(II) an organoaluminum compound represented by the general formula $Al(OR^1)_mR^2_nX_{3-(m+n)})$ wherein R^1 and R^2 are each a hydrocarbon radical having 1 to 24 carbon atoms, X is hydrogen atom or a halogen atom, and m and n and $0 < m < 3$ and $0 < n < 3$ provided $0 < n < 3$ provided $0 < m+n \leqq 3$.

5,463,002

METATHESIS CATALYST SYSTEM

Tomoo Sugawara; Shingo Kudo, both of Kanagawa, and Kinichi Okumura, Hyogo, all of, Japan, assignors to Nippon Zeon Co., Ltd., Tokyo, Japan

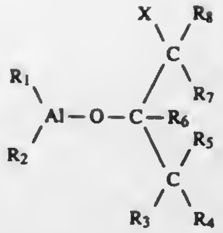
Filed Sep. 28, 1992, Ser. No. 951,597

Claims priority, application Japan, Sep. 27, 1991, 3-276752

Int. Cl.^{6} C08G *61/08;* C08F *4/52*

U.S. Cl. 526—161 16 Claims

1. A metathesis polymerizable composition comprising a metathesis catalyst, a norbornene-functional monomer, and a cocatalyst selected from halogenated aluminum compounds of the formula:



wherein R_1 is selected from branched or unbranched C_1 to C_{12} alkyl, or C_6 to C_{12} aryl; R_2 is selected from branched or unbranched C_1 to C_{12} alkyl, C_6 to C_{12} aryl, branched or unbranched C_1 to C_{12} alkoxy, C_6 to C_{12} aryloxy, or halogen; R_3 is selected from hydrogen, or halogen; R_4 to R_8 are independently selected from hydrogen, branched or unbranched C_1 to C_{12} alkyl, or halogen, and any of R_4 to R_8 can be taken together to form a saturated or unsaturated carbocyclic ring; and X is a halogen selected from chlorine, fluorine, or iodine.

5,463,003

PROCESS FOR POLYMERIZING CONJUGATED DIENES WITH LITHIUM-TIN-NITROGEN INITIATORS

Yasuo Horikawa; Toshiki Takizawa, and Taro Akazawa, all of Tokyo, Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed Dec. 28, 1993, Ser. No. 174,366

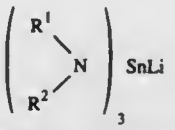
Claims priority, application Japan, Dec. 28, 1992, 4-349412

Int. Cl.^{6} C08F *4/48;4/58;36/06*

U.S. Cl. 526—176 **24 Claims**

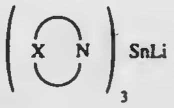
1. A process for preparing a polymer selected from the group consisting of a conjugated diene homopolymer and a conjugated diene-aromatic vinyl hydrocarbon copolymer, comprising the step of polymerizing a mixture of: (a) an initiator compound containing a secondary amino or an imino group, tin and lithium; and (b) a conjugated diene monomer or a conjugated diene monomer and an aromatic vinyl hydrocarbon monomer; wherein the initiator has a formula selected from the group consisting of formula (A) and formula (B):

(A)



wherein R^1 and R^2 each independently represents an aliphatic hydrocarbon group containing 1 to 20 carbon atoms, an aromatic hydrocarbon group containing 5 to 20 carbon atoms, or a cycloaliphatic hydrocarbon group containing 3 to 20 carbon atoms;

(B)



wherein X represents:

a saturated cyclic group having the formula $(CR^3R^4)_n$;

a saturated cyclic group having the formula $(CR^5R^6)_m$—Y—$(CR^5R^6)_l$,

wherein Y represents NR^7 or O; or

imine compounds having a carbon-carbon double bond;

wherein R^3, R^4, R^5 and R^6 each independently represents hydrogen or an aliphatic hydrocarbon group containing 1 to 10 carbon atoms, an aromatic hydrocarbon group containing 5 to 10 carbon atoms, or a cycloaliphatic hydrocarbon group containing 3 to 10 carbon atoms, R^7 is an aliphatic hydrocarbon group containing 1 to 10 carbon atoms, an aromatic hydrocarbon group containing 5 to 10 carbon atoms, or a cycloaliphatic hydrocarbon group containing 3 to 10 carbon atoms, n represents an integer between 3 and 10, and the sum of m and l is between 2 and 9.

5,463,004

PROCESS FOR POLYMERIZING CONJUGATED DIENES WITH LITHIUM-TIN-NITROGEN INITIATORS

Yasuo Horikawa, Tokyo, Japan, assignor to Bridgestone Corporation, Tokyo, Japan

Filed Mar. 25, 1994, Ser. No. 217,632

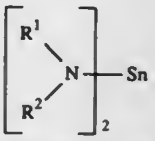
Claims priority, application Japan, Mar. 25, 1993, 5-066850

Int. Cl.^{6} C08F *4/48;4/58;36/06*

U.S. Cl. 526—176 **22 Claims**

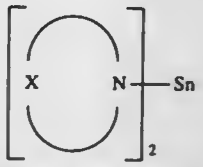
1. A process for preparing a polymer selected from the group consisting of a conjugated diene homopolymer, a conjugated diene-aromatic vinyl hydrocarbon copolymer and an aromatic vinyl hydrocarbon homopolymer in a hydrocarbon solvent, comprising the steps of: initiating polymerization of one or more monomers selected from the groups consisting of conjugated diene monomers and aromatic vinyl hydrocarbon monomers, with a lithium compound as an initiator, and adding a tin compound during propagation at any time from immediately after initiation until conversion reaches 100 %; wherein the amount of the tin compound is between 0.1 to 2 mole equivalents per 1 mole equivalent lithium at the active end of the polymer; wherein the tin compound has a formula selected from the group consisting of compounds of general formula (A) and general formula (B):

(A)



wherein R^1 and R^2 may be same or different and each represents an aliphatic hydrocarbon group containing 1 to 20 carbon atoms, an aromatic hydrocarbon group containing 5 to 20 carbon atoms or a cycloaliphatic hydrocarbon containing 3 to 20 carbon atoms;

(B)



wherein X represents one of the following hydrocarbon groups:

X - I: a saturated group having the formula $(CR^3R^4)_n$ that forms a ring with the N in formula (B);

X - II: a saturated group having the formula $(CR^5R^6)_m$-Y-$(CR^5R^6)_l$ that forms a ring with the N in formula (B), wherein Y is NR^7 or O;

X -III: an unsaturated group having a carbon-carbon double bond that forms a ring with the N in formula (B);

wherein R^3, R^4, R^5, and R^6, which may be the same or different, each independently represents a hydrogen atom, an aliphatic hydrocarbon group containing 1 to 10 carbon atoms, an aromatic hydrocarbon group containing 5 to 10 carbon atoms, and a cycloaliphatic hydrocarbon group containing 3 to 10 carbon atoms, R^7 is an aliphatic hydrocarbon group containing 1 to 10 carbon atoms, an aromatic hydrocarbon group containing 5 to 10 carbon atoms, and a cycloaliphatic hydrocarbon group containing 3 to 10 carbon atoms, n is an integer between 3 and 10, and m and a l are each an integer, the sum of which is from 2 to 9.

5,463,005

COPOLYMERS OF TETRAFLUOROETHYLENE AND PERFLUORINATED SULFONYL MONOMERS AND MEMBRANES MADE THEREFROM

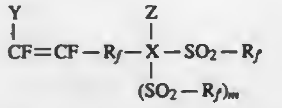
Darryl D. Desmarteau, Clemson, S.C., assignor to Gas Research Institute, Chicago, Ill.

Continuation of Ser. No. 829,878, Jan. 3, 1992, abandoned. This application Aug. 11, 1993, Ser. No. 105,109

Int. Cl.⁶ C08F *228/02*

U.S. Cl. 526—240 **12 Claims**

1. A copolymer of tetrafluoroethylene and monomer having the general formula:



$$CF{=}CF(Y)-R_f-X(Z)(SO_2-R_f)_m-SO_2-R_f$$

wherein X is C, CH or N, Z is a Group IA element, calcium, magnesium, strontium, or barium, R_f is a perfluoroalkylene group chosen from the group consisting of a perfluoroalkylene, a perfluoroalkylene containing one or more ether groups, a perfluoroalkylene containing one or more sulfonyl groups, and a perfluoroalkylene containing ether and sulfonyl groups, R_f is C_nF_{2+1} (n=0, 1, 2, . . . 10), Y is C_nF_{2n+1} (n=0, 1, 2, . . .10) and m is 0 or 1.

5,463,006

THERMOPROCESSABLE COPOLYMERS OF TETRAFLUOROETHYLENE

Julio A. Abusleme, Saronno, and Pasqua Colaianna, Milan, both of, Italy, assignors to Ausimont, S.p.A., Milan, Italy

Filed Jul. 1, 1994, Ser. No. 273,266

Claims priority, application Italy, Jul. 5, 1993, MI93A1444

Int. Cl.⁶ C08F *214/26*

U.S. Cl. 526—247 **4 Claims**

1. Thermoprocessable tetrafluoroethylene copolymers, which consist of:

(a) from 0.5 to 13% by weight of perfluoromethylvinylether;

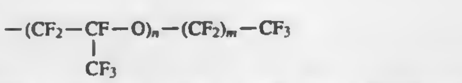
(b) from 0.05 to 3% by weight of one or more fluorinated monomers selected from the group consisting of:

(1) $R^1O{-}CF{=}CF_2$ (I)

wherein R^1 is selected from:

i) $-R_F-T$ wherein R_F is a perfluoroalkylene radical having from 2 to 12 carbon atoms and T is F, Cl or H;

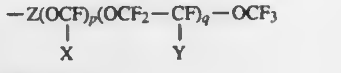
ii)



$$-(CF_2-CF(CF_3)-O)_n-(CF_2)_m-CF_3 \quad \text{(II)}$$

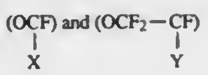
wherein n is a number from 1 to 4, and m is a number from 0 to 3;

iii)



$$-Z(OCF(X))_p(OCF_2-CF(Y))_q-OCF_3 \quad \text{(III)}$$

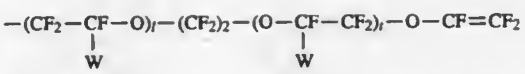
wherein the



$$(OCF(X)) \text{ and } (OCF_2-CF(Y))$$

units are randomly distributed along the chain; X and Y are, independently from each other, —F or $—CF_3$; Z is —(CFX)— or $—(CF_2—CFY)—$; p and q, equal or different from each other, are numbers from 0 to 10; the average number molecular weight of the monomer being from 200 to 2,000;

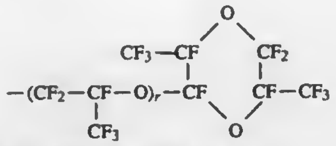
iv)



$$-(CF_2-CF(W)-O)_l-(CF_2)_2-(O-CF(W)-CF_2)_t-O-CF{=}CF_2 \quad \text{(IV)}$$

wherein W is —Cl, —F or $—CF_3$, and l and t are numbers from 0 to 5;

v) (V)



wherein r is a number from 0 to 4;

(2) $R^2{-}CH{=}CH^2$ (VI)

wherein R^2 is a $—R_F—T$ group where R_F is a perfluoroalkylene radical having from 2 to 12 carbon atoms, and T is F, Cl or H;

c) tetrafluoroethylene, in such an amount that the sum of the percentages of the various monomers is equal to 100% by weight.

5,463,007

POLYMERS OF SELF- AND DIOL REACTIVE FORMALDEHYDE-FREE CROSSLINKING MONOMERS

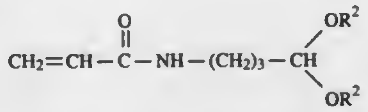
Robert K. Pinschmidt, Jr., Allentown; Dale D. Dixon, Kutztown; William F. Burgoyne, Jr., and Joel E. Goldstein, both of Allentown, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Continuation of Ser. No. 728,773, Jul. 8, 1991, abandoned, which is a continuation of Ser. No. 471,146, Jan. 26, 1990, abandoned, which is a continuation of Ser. No. 762,977, Aug. 6, 1985, abandoned. This application May 19, 1993, Ser. No. 64,726

Int. Cl.⁶ C08F *22/38;24/00*

U.S. Cl. 526—266 **11 Claims**

1. A copolymer emulsion comprising an aqueous colloidal dispersion of a copolymer containing 50 to 94.5 wt % vinyl acetate, 5 to 40 wt % ethylene and 0.5 to 10 wt % of a monomer represented by the formula



$$CH_2{=}CH-C({=}O)-NH-(CH_2)_3-CH(OR^2)_2$$

where R^2 is a C_1–C_4 alkyl radical, which self-crosslinks under acidic curing conditions.

5,463,008

MONOMERS FOR DOUBLE RING-OPENING POLYMERIZATION WITH EXPANSION

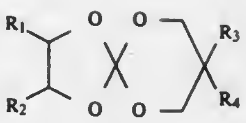
Jeffrey W. Stansbury, Gaithersburg, Md., assignor to The United States of America as represented by the Secretary of Commerce, Washington, D.C.

Division of Ser. No. 846,480, Mar. 6, 1992, Pat. No. 5,362,889. This application Jul. 12, 1994, Ser. No. 273,753

Int. Cl.⁶ C08F *24/00;20/30*

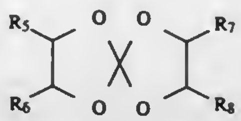
U.S. Cl. 526—268 **13 Claims**

1. A method of preparing a polymerizate from a reactant monomer or prepolymer which undergoes shrinkage during the formation of said polymerizate which comprise reacting said reactant monomer or prepolymer in the presence of a monomer selected from the group consisting of:



(I)

and



(II)

wherein R_1 represents a C_1–C_6 alkenyl, R_2 represents C_1–C_6 alkenyl, R_3 represents a C_1–C_6 alkyl or C_3–C_8 cycloaliphatic unsubstituted, or substituted with halo, C_1–C_6 alkyl, alkoxy, hydroxy, or one of one or more hetero atoms; R_4 represents a C_1–C_6 alkyl or C_3–C_8 cycloaliphatic unsubstituted, or substituted with halo, C_1–C_6 alkyl, alkoxy, hydroxy, or one of one or more hetero atoms; R_5 is a C_1–C_6 alkenyl; R_6 represents C_1–C_6 alkenyl; R_7 is a C_1–C_6 alkenyl or C_3–C_8 cycloaliphatic unsubstituted, or substituted with halo, C_1–C_6 alkyl, alkoxy, hydroxy, or one of one or more hetero atoms; or aryl; and R_8 is hydrogen or C_1–C_6 alkyl or a C_3–C_8 cycloaliphatic unsubstituted, or substituted with halo, C_1–C_6 alkyl, alkoxy, hydroxy, or one of one or more hetero atoms; or aryl to form a polymerizate containing said reactant and said monomer as chemically contained constituents thereof.

5,463,009
FLUORINE-MODIFIED SILICONE, PROCESS FOR PREPARING THE SAME, AND COSMETICS CONTAINING THE SAME

Jouji Okada, Tochigi; Akira Kawamata, Wakayama; Tadayuki Tokunaga, Chiba; Makoto Torizuka, Kanagawa, and Masahiko Asahi, Tokyo, all of, Japan, assignors to Kao Corporation, Tokyo, Japan

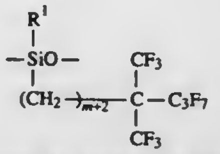
Filed Dec. 8, 1994, Ser. No. 354,756

Claims priority, application Japan, Dec. 9, 1993, 5-309133

Int. Cl.^{6} C08G *77/08*

U.S. Cl. 528—15 **4 Claims**

1. A fluorine-modified silicon compound having a polymerization degree of from 1 to 400 and containing at least one siloxane unit represented by formula (1):



(1)

wherein R^1 represents an aliphatic straight-chain or branched hydrocarbon group having 1 to 20 carbon atoms, an alicyclic hydrocarbon group having 5 to 10 carbon atoms or an aromatic hydrocarbon group having 6 to 10 carbon atoms; and m represents 0 or an integer of from 1 to 10.

5,463,010
HYDROCYCLOSILOXANE MEMBRANE PREPARED BY PLASMA POLYMERIZATION PROCESS

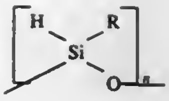
Chen-Ze Hu; Eric K. Dolence, both of Salt Lake City; Shigemasa Osaki, Sandy, and Clifton G. Sanders, Salt Lake City, all of Utah, assignors to Surface Engineering Technologies, Division of Innerdyne, Inc., Salt Lake City, Utah

Filed Nov. 12, 1993, Ser. No. 152,176

Int. Cl.^{6} C08G *77/06;77/12*

U.S. Cl. 528—25 **37 Claims**

1. A composition of matter comprising a membrane formed from the plasma polymerization of hydrocyclosiloxane monomer of the general formula:



where R is an aliphatic group having 1 to about 5 carbon atoms and n is an integer from 2 to about 10.

5,463,011
ACID DERIVATIVES

George R. Brown, Wilmslow, and Richard E. Shute, Macclesfield, both of, United Kingdom, assignors to Zeneca Limited, London, England

Continuation-in-part of Ser. No. 266,454, Jun. 27, 1994, abandoned. This application Dec. 29, 1994, Ser. No. 365,761

Claims priority, application United Kingdom, Jun. 28, 1993, 9313269

Int. Cl.^{6} C08G *18/00*

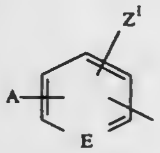
U.S. Cl. 528—44 **7 Claims**

1. An allophanic acid derivative of formula I

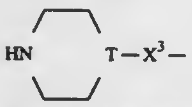
$$R^1{-}N(R^2)CO{-}N(R^3)CO{-}X^1{-}Q{-}X^2{-}G \qquad I$$

wherein

R^1 represents a group of formula II or III



II



III

in which A is attached meta or para to the position where the group NR^2CONR^3CO is attached and is selected from aminomethyl, guanidino and $R^aN{=}C(NH_2)$— where R^a is hydrogen or phenyl which is unsubstituted or substituted by 1 or 2 of halogeno, (1–4C)alkyl, (1–4C)alkoxy, cyano and nitro,

E is CH or N,

Z^1 is hydrogen, halogeno, (1–4C)alkyl, (1–4C)alkoxy, cyano or nitro,

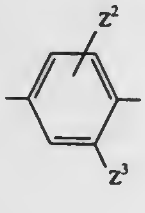
T is N or CH, and

X^3 is a bond, (1–4C)alkylene or, when T is CH, oxy(1–3C)alkylene;

R^2 and R^3, which may be the same or different, represent hydrogen, (1–4C)alkyl or ar(1–4C)alkyl;

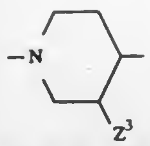
X^1 is a bond or (1–4C)alkylene;

Q is a group of formula IV or V



IV

-continued



V

in which Z^2 is hydrogen, halogeno, (1–4C)alkyl, (1–4C)alkoxy, cyano or nitro, and

Z^3 is a group of formula X^2—G^a in which X^2 can have any of the values given hereinafter for X^2 and G^a can have any of the values given hereinafter for G, or G^a has any of the values given hereinbefore for Z^2;

X^2 is a bond, (1–4C)alkylene, oxy(1–3C)alkylene or a group of formula $CH_2CH(NHXR^4)$ in which X is SO_2, CO or CO_2 and R^4 is (1–6C)alkyl, (6–12C)aryl or (6–12C)aryl(1–4C)alkyl, in any of which the aryl group may optionally be substituted by (1–4C)alkyl; and

G is a carboxy group or a pharmaceutically acceptable metabolically labile ester or amide thereof; and

pharmaceutically acceptable salts thereof.

5,463,012

POLYCARBONATES AND THE USE THEREOF FOR THE PREPARATION OF BIOEROSIBLE MATRICES

Paolo Ferruti; Elisabetta Ranucci, and Fabio Bignotti, all of Trezzano Sul Naviglio, Italy, assignors to Mediolanum Farmaceutici S.p.A., Milan, Italy

PCT No. PCT/EP92/01262, § 371 Date Dec. 10, 1993, § 102(e) Date Dec. 10, 1993, PCT Pub. No. WO92/22600, PCT Pub. Date Dec. 23, 1992

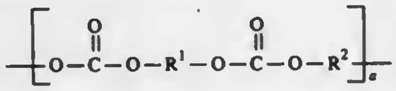
PCT Filed Jun. 5, 1992, Ser. No. 157,153

Claims priority, application Italy, Jun. 14, 1991, MI91A1645

Int. Cl.⁶ C08G *64/00*

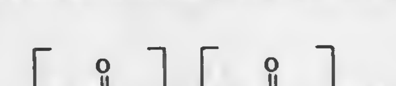
U.S. Cl. 528—196 **8 Claims**

1. A polycarbonate of formula (I)



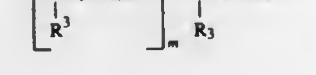
$$-\!\!\left[O-\overset{O}{\overset{\|}{C}}-O-R^1-O-\overset{O}{\overset{\|}{C}}-O-R^2\right]_a\!\!- \qquad (I)$$

wherein a is an integer from 2 to 300; R^1 and R^2 are the same or different, and are independently a polyester residue of formula (III)



$$-\!\!\left[R^4-\overset{O}{\overset{\|}{C}}-O\right]_x\!\!\left[R^5-\overset{O}{\overset{\|}{C}}-O\right]_y\!\!-R^6 \qquad (III)$$

wherein x and y are integers from 0 to 50, R^4 and R^5, which are the same or different and are aliphatic straight or branched hydrocarbon chains having from 1 to 4 carbon atoms, R^6 is an aliphatic or alicyclic straight or branched chain having from 2 to 18 carbon atoms, or a polyoxyalkylene residue of formula (II)



$$-\!\!\left[\underset{\substack{|\\R^3}}{CH}(CH_2)_nO\right]_m\!\!-\underset{\substack{|\\R_3}}{CH}(CH_2)_n- \qquad (II)$$

in which R^3 is hydrogen or methyl, n is an integer from 1 to 3 and m is an integer from 1 to 200, and said two groups —R^4—COO and —R^5—COO are randomly distributed in the polyester residue, x and y being in any ratio from 0 to 100.

5,463,013

MODIFIED AROMATIC POLYCARBONATE RESIN, MODIFIED AROMATIC POLYESTER CARBONATE RESIN, MODIFIED POLYARYLATE, AND MOLDED ARTICLES THEREFROM

Toshimasa Tokuda, Iyo; Ikkoh Furukawa, Mihara, and Masayoshi Miyauchi, Matsuyama, all of, Japan, assignors to Teijin Chemicals, Ltd., Tokyo, Japan

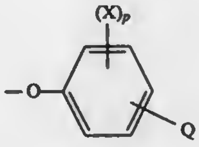
Filed Apr. 26, 1994, Ser. No. 233,883

Claims priority, application Japan, Apr. 27, 1993, 5-101081; Apr. 27, 1993, 5-101083

Int. Cl.⁶ C08G *64/00*

U.S. Cl. 528—196 **25 Claims**

1. A modified aromatic polycarbonate resin comprising an aromatic polycarbonate resin having at least one substituted phenyloxy group of the following formula (I) in an amount of at least 5 mol % of the total amount of terminal groups of said polycarbonate resin,

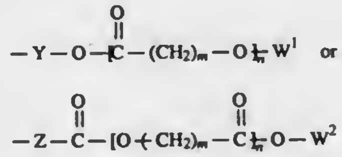


(I)

wherein:

X is a halogen atom or a monovalent aliphatic hydrocarbon group having 1 to 10 carbon atoms,

p is an integer of 0 to 4, and



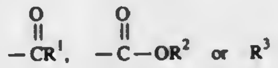
$$-Y-O\!\!-\!\!\left[\overset{O}{\overset{\|}{C}}-(CH_2)_m-O\right]_n\!\!-W^1 \quad \text{or}$$

$$-Z-\overset{O}{\overset{\|}{C}}-\left[O\!\left(CH_2\right)_m-\overset{O}{\overset{\|}{C}}\right]_n\!\!-O-W^2$$

in which:

Y is a divalent aliphatic hydrocarbon group having 1 to 10 carbon atoms,

W^1 is a hydrogen atom,



$$-\overset{O}{\overset{\|}{C}}R^1, \quad -\overset{O}{\overset{\|}{C}}-OR^2 \quad \text{or} \quad R^3$$

in which each of R^1, R^2 and R^3 is a monovalent aliphatic hydrocarbon group having 1 to 10 carbon atoms, a monovalent alicyclic hydrocarbon group having 4 to 8 carbon atoms or a monovalent aromatic hydrocarbon group having 6 to 15 carbon atoms,

m is an integer of 4 to 20,

n is an integer of 1 to 100,

Z is a single bond or a divalent aliphatic hydrocarbon group having 1 to 10 carbon atoms, and

W^2 is a hydrocarbon atom, a monovalent aliphatic hydrocarbon group having 1 to 10 carbon atoms, an alicyclic hydrocarbon group having 4 to 8 carbon atoms or a monovalent aromatic hydrocarbon group having 6 to 15 carbon atoms.

5,463,014

ELECTROMAGNETIC RADIATION ABSORBERS AND MODULATORS COMPRISING POLYANILINE

Arthur J. Epstein, Bexley, Ohio; Mitchell G. Roe, Nashville, Tenn.; John M. Ginder, Plymouth, Mich.; Hamid Hajiseyed-javadi, Palmdale, Calif., and Jinsoo Joo, Columbus, Ohio, assignors to The Ohio State University Research Foundation, Columbus, Ohio

Continuation-in-part of Ser. No. 918,709, Jul. 27, 1992, Pat. No. 5,294,694, which is a division of Ser. No. 764,236, Sep. 23, 1991, Pat. No. 5,147,968, which is a division of Ser. No. 193,964, May 13, 1988, Pat. No. 5,079,334. This application Feb. 8, 1994, Ser. No. 193,229

Int. Cl.^{6} C08G *65/38;* **B05D** *3/02;3/06*

U.S. Cl. 528—210 **4 Claims**

1. A method of providing electromagnetic radiation shielding comprising applying a layer of polyaniline composition on an object to be shielded selected from the group consisting of the walls of television sets, computers, electronic machinery, storage places for electronic data, electrical wires, and the walls, floor, and ceiling of a room, whereby electromagnetic radiation shielding of said object is achieved.

5,463,015

MAGNETIC TAPE FOR USE IN CASSETTE FOR DIGITAL AUDIO TAPE RECORDER AND BIAXIALLY ORIENTED POLYESTER BASE FILM THEREFOR

Takao Chujo; Hisashi Hamano; Masanori Nishiyama; Yasuhiro Saeki; Tatsuya Ogawa, all of Sagamihara, and Kouhei Endou, Anpachi, all of, Japan, assignors to Teijin Ltd., Osaka, Japan

Division of Ser. No. 274,755, Jul. 14, 1994, which is a division of Ser. No. 213,638, Mar. 16, 1994, Pat. No. 5,362,571. This application Dec. 7, 1994, Ser. No. 350,470

Claims priority, application Japan, Mar. 16, 1993, 5-055585; May 28, 1993, 5-126982; May 28, 1993, 5-126983; May 28, 1993, 5-126984; Jun. 15, 1993, 5-143635; Jun. 23, 1993, 5-152124

Int. Cl.^{6} C08G *63/02*

U.S. Cl. 528—308.2 **12 Claims**

1. A biaxially oriented polyester base film for a magnetic tape for use in a cassette for a digital audio tape recorder, characterized in that:

(a) the stress when the biaxially oriented polyester base film is extended in the longitudinal direction by 5% is at least 12 kg/mm^2,

(b) the residual extension in the longitudinal direction is 0.2% or less and the residual extension in the transverse direction is 0 3% or less,

(c) the heat shrinkage in the longitudinal direction after a heat treatment under no load at 105° C. for 30 minutes is 1.5% or less,

(d) at least one surface of the biaxially oriented polyester base film has a surface roughness, Ra, of 25 nm or less, and

(e) the film thickness is in the range of from 3 to 12 μm.

5,463,016

GRANULAR MATERIAL OF POLYIMIDE PRECURSOR, MIXTURE COMPRISING THE MATERIAL AND PROCESS FOR PRODUCING THE MATERIAL

Isao Tomioka, Kyoto; Takeshi Nakano, Ibaraki; Mikio Furukawa, and Yoshiaki Echigo, both of Kyoto, all of, Japan, assignors to Unitika Ltd., Hyogo, Japan

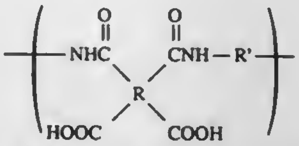
Continuation of Ser. No. 935,786, Aug. 27, 1992, abandoned. This application Feb. 9, 1994, Ser. No. 193,887

Claims priority, application Japan, Aug. 28, 1991, 3-244646; Sep. 30, 1991, 3-280862; Sep. 30, 1991, 3-280863; Jan. 28, 1991, 3-309868; Jan. 22, 1992, 4-032657; Jul. 16, 1992, 4-213689

Int. Cl.^{6} C08G *77/10;69/26*

U.S. Cl. 528—353 **13 Claims**

1. A poly(amic acid) powder comprising repeating units represented by formula (1):



(1)

wherein R is a tetravalent aromatic radical having 1 to 5 benzenoid-unsaturated rings of 6 carbon atoms, the four carbonyl groups being directly bonded to different carbon atoms in a benzene ring of the R radical and each pair of carbonyl groups being bonded to adjacent carbon atoms in the benzene ring of the R radical; and R' is a divalent aromatic radical having 1 to 5 benzenoid-unsaturated rings of 6 carbon atoms, the amino groups being directly bonded to different carbon atoms in a benzene ring of the R' radical, said powder having:

(1) an intrinsic viscosity of 0.7 or more, and

(2) a solubility in tetrahydrofuran of 1 g/100 ml or less.

5,463,017

PROCESS FOR PREPARING POLYSUCCINIMIDES FROM MALEAMIC ACID

Yi H. Paik, Princeton, N.J.; Ethan S. Simon, Ambler, and Graham Swift, Blue Bell, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 911,865, Jul. 10, 1992, Pat. No. 5,371,177. This application Aug. 25, 1994, Ser. No. 296,081

Int. Cl.^{6} C08G *69/10;73/10*

U.S. Cl. 528—361 **11 Claims**

1. A process for preparing polysuccinimides comprising:

a) forming a polymerization mixture of poly(alkylene glycol), maleamic acid and, optionally, up to 80 percent by weight of one or more other amic acids, based on the weight of maleamic acid; wherein the amic acids are selected from the group consisting of the amic acids of mesaconic acid, methylenemalonic acid, itaconic acid, citraconic acid, aconitic acid, monoethylenically unsaturated oligomers of poly(acrylic acid), monoethylenically unsaturated oligomers of poly(methacrylic acid), butene-1,3,4-tricarboxylic acid, monomethylmaleate, monomethyl itaconate, acrylic acid, methacrylic acid, and crotonic acid;

b) heating the mixture to an elevated temperature of from about 120° C. to about 250° C.;

c) maintaining the mixture at the elevated temperature to form polysuccinimides; and

d) hydrolyzing the polysuccinimides to form the corresponding poly(amino acid).

5,463,018

PREPARATION OF DOPED POLYCARBYNES

Reuben D. Rieke, Lincoln, Nebr., assignor to Board of Regents of the University of Nebraska, Lincoln, Nebr.

Continuation-in-part of Ser. No. 152,725, Nov. 15, 1993. This application Jan. 25, 1994, Ser. No. 186,289

Int. Cl.^{6} C08G *75/02*

U.S. Cl. 528—373 **23 Claims**

1. A method for preparation of a doped polycarbyne comprising: contacting a source of electrons which is soluble in an ethereal, polyethereal or hydrocarbon solvent and has a reduction potential of −0.2 or more negative relative to the standard calomel electrode with a carbyne containing organic monomer or co-monomer in an ethereal, polyethereal or hydrocarbon solvent to form a doped polycarbyne; wherein said organic monomer contains at least one carbyne group and at least one atom selected from the group consisting of nitrogen, boron, arsenic, antimony, bismuth, sulfur, selenium, and phosphorus electrons is soluble in an ethereal, polyethereal, or hydrocarbon.

5,463,019

POLYMERS AND COPOLYMERS FROM 3-AZIDOMETHYL-3-NITRATOMETHYLOXETANE

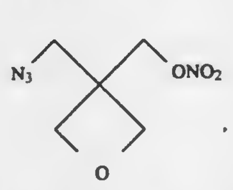
Gerald E. Manser, El Dorado Hills; Aslam A. Malik, Cameron Park, and Thomas G. Archibald, Fair Oaks, all of Calif., assignors to Aerojet-General Corporation, Sacramento, Calif.

Continuation-in-part of Ser. No. 940,269, Sep. 2, 1992, abandoned. This application Jan. 23, 1995, Ser. No. 377,572

Int. Cl.^{6} C08G *65/22;* C07D *305/06;* C07C *43/10*

U.S. Cl. 528—402 **19 Claims**

1. A polymer formed by the cationic polymerization of a compound having the formula



said polymer having a weight average molecular weight ranging from about 1,000 to 100,000.

5,463,020

PREPARATION OF POLYTETRAHYDROFURAN OR TETRAHYDROFURAN/ALKYLENE OXIDE COPOLYMERS

Rainer Becker, Bad Duerkheim; Michael Huellmann, Heppenheim; Christof Palm, Ludwigshafen, and Wolfgang Franzischka, Frankenthal, all of, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Jun. 30, 1994, Ser. No. 268,954

Claims priority, application Germany, Jul. 26, 1993, 43 25 023.8

Int. Cl.^{6} C08G *65/20;65/10*

U.S. Cl. 528—408 **10 Claims**

1. In a process for the preparation of a polytetrahydrofuran or a tetrahydofuran/C_2–C_{10}-alkylene oxide copolymer having a molecular weight of from 250 to 20,000 Dalton by the cationic polymerization of tetrahydrofuran alone or with a C_2–C_{10}-alkylene oxide, optionally in the presence of a promoter, the improvement which comprises:

carrying out said polymerization using as the catalyst a mixture consisting of boric acid and at least one di- or tricarboxylic acid.

5,463,021

PROCESS FOR WORKING UP AQUEOUS DISPERSIONS OF FLUORINATED THERMOPLASTIC

Gerhard Beyer, Burgkirchen; Reinhard Sulzbach; Edward Wess, both of Burghausen, and Rolf Hengel, Burgkirchen, all of, Germany, assignors to Hoechst Aktiengesellschaft, Germany

Filed Oct. 6, 1993, Ser. No. 132,741

Claims priority, application Germany, Jan. 8, 1992, 42 33 824.7

Int. Cl.^{6} C08F *6/16*

U.S. Cl. 528—482 **13 Claims**

1. A process for working up aqueous dispersions of fluorinated thermoplastics which comprises

substantially replacing by hydrogen ions the cations in the aqueous dispersion which have resulted from the polymerization,

compressing the dispersion, optionally after dilution with water,

coagulating the compressed dispersion by decompressing it through one or more opening(s) small enough to provide coagulation, said compressing step being carried out at sufficient pressure to induce coagulation when said compressed dispersion is decompressed,

transferring the resulting coagulated phase, optionally after dilution with water and/or heating, onto a filter,

washing the product there,

dewatering the resulting product mechanically, and

breaking up the product to give a free-flowing product.

5,463,022

N-ACETYLCARBOXYMETHYLCHITOSAN DERIVATIVES AND PROCESS FOR PREPARATION THEREOF

Kazuhiro Inoue, Funabashi; Teruomi Ito, Matsudo; Satoshi Okuno, Misato, and Katsutoshi Aono, Nara, all of, Japan, assignors to Drug Delivery System Institute, Ltd., Tokyo, Japan

PCT No. PCT/JP91/01101, § 371 Date Feb. 16, 1993, § 102(e) Date Feb. 16, 1993, PCT Pub. No. WO92/03480, PCT Pub. Date Mar. 5, 1992

PCT Filed Aug. 16, 1991, Ser. No. 969,307

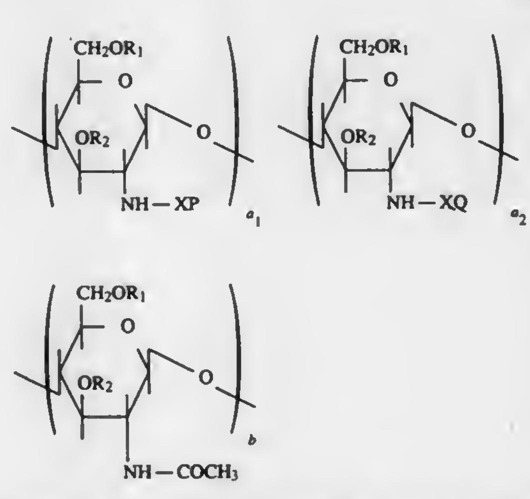
Claims priority, application Japan, Aug. 17, 1990, 2-215803

Int. Cl.^{6} A61K *38/00;* C07K *9/00;* C08B *37/00;* C07G *17/00*

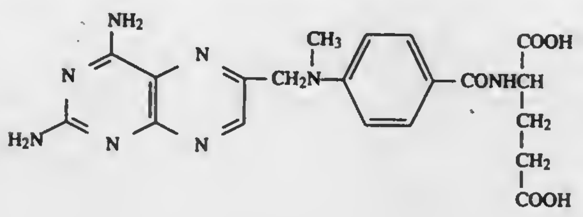
U.S. Cl. 530—322 **11 Claims**

1. An N-acetylcarboxymethylchitosan derivative represented by the following formula (Ia):

(Ia)



wherein R_1 and R_2 individually mean H or carboxymethyl group with the proviso that R_1 and R_2 do not stand for H at the same time, P denotes such residue of methotrexate which is formed by removal of an —OH group from any one of the two carboxyl groups of methotrexate as represented by the formula:



and Q stands for H, X represents a peptide chain having the formula -Gly-Gly-Gly- and terminated by —NH— towards P or Q; a_1 represents a positive integer and a_2 represents zero, and b stands for a positive integer; and wherein a_1 and b are selected so that said N-acetylcarboxymethylchitosan derivative has the following characteristic values (1)–(4):

(1) carboxymethylation degree:	1.0
(2) molecular weight (as measured by gel filtration method):	1×10^5
(3) a/(a + b): [provided that $a = a_1 + a_2$]	0.2
(4) P/X ratio (molar ratio):	1.0.

5,463,023
COMPOSITION FOR INHIBITION OF INTRACELLULAR TRANSCRIPTION

Robert D. Schreiber; Andrew C. Greenlund, both of St. Louis, Mo., and Michael A. Farrar, Seattle, Wash., assignors to Washington University, St. Louis, Mo.

Filed Oct. 22, 1993, Ser. No. 141,499

Int. Cl.^{6} C07K *7/00;7/04*

U.S. Cl. 530—327 **2 Claims**

1. A composition of matter comprising an isolated peptide containing the sequence of SEQ ID NO:1 (Xaa_1-Asp-Xaa_2-Xaa_3-His, where Xaa_1 is a phosphorylated tyrosine, and Xaa_2 and Xaa_3 are any amino acid), or a derivative thereof, that specifically binds to transcription factor p91 in a manner inhibiting its transcriptional initiating properties elicited by interferonγ.

5,463,024
FUSION PROTEINS AND PARTICLES

Alan J. Kingsman; Susan M. Kingsman, both of Islip; Sally E. Adams, Kidlington; Elizabeth J. C. Mellor, Oxford, and Michael H. Malim, Upleadon, all of, United Kingdom, assignors to British Biotech Pharmaceuticals Limited, Oxford, England

Continuation of Ser. No. 652,054, Feb. 7, 1991, abandoned, which is a continuation of Ser. No. 112,082, Oct. 26, 1987, Pat. No. 5,008,373, which is a continuation-in-part of Ser. No. 36,807, Apr. 10, 1987, Pat. No. 5,041,385. This application Sep. 1, 1993, Ser. No. 115,397

Claims priority, application United Kingdom, Nov. 1, 1986, 8626148; Apr. 9, 1987, 8708531

Int. Cl.^{6} C12N *15/33;15/58;* **C07R** *3/00*

U.S. Cl. 530—350 **4 Claims**

1. An antigen-presenting assembled proteinaceous particle comprising a plurality of molecules of a self assembling fusion protein, the fusion protein comprising a first amino acid sequence fused with a second amino acid sequence, the first amino acid sequence consisting of a self-assembling particle-forming polypeptide encoded by the gag gene of a retrovirus the second amino acid sequence defining a viral, bacterial or protozoal antigenic epitope which is not encoded by a nucleotide sequence naturally fused in frame to the gag gone, the second amino acid sequence having antigenic activity in the assembled. particle.

5,463,025
PROTEIN HAVING HUMAN PLASMIN INHIBITING ACTIVITY

Yoshihiko Sumi, Hino; Yataro Ichikawa, Tokorozawa; Nobuo Aoki, Tokyo, and Masami Muramatsu, Tokorozawa, all of, Japan, assignors to Teijin Limited, Japan

Continuation of Ser. No. 60,691, May 13, 1993, abandoned, which is a continuation of Ser. No. 419,913, Sep. 5, 1989, abandoned. This application Jan. 24, 1994, Ser. No. 185,162

Claims priority, application Japan, Sep. 5, 1988, 63-220437

Int. Cl.^{6} C07K *14/47;* **A61K** *38/17*

U.S. Cl. 530—380 **7 Claims**

1. An isolated, substantially pure recombinant protein having human plasmin inhibiting activity of about 70 to 110% of the reactivity with human plasmin to human α_2-plasmin inhibitor derived from plasma, capable of binding to human fibrin at a level of about ¼ to about ⅓ of that of the human α_2-plasmin inhibitor derived from plasma, when measured by the amount of I^{125} labelled protein taken up into a fibrin clot, by means of a gamma-counter, and a molecular weight of about 50,000 to about 77,000.

5,463,026
ANTI-HUMAN PROHIBITIN ANTIBODIES

Yusuke Nakamura, and Takaaki Sato, both of Tokyo, Japan, assignors to Cancer Institute, and Eisai Co., Ltd., both of Tokyo, Japan

Division of Ser. No. 114,461, Aug. 31, 1993, Pat. No. 5,401,635, which is a division of Ser. No. 9,255, Jan. 22, 1993, abandoned. This application Feb. 4, 1994, Ser. No. 192,156

Claims priority, application Japan, Jan. 24, 1992, 4-11156; Nov. 18, 1992, 4-308654

Int. Cl.^{6} C07K *16/00;16/18;16/30;* **C12Q** *1/68*

U.S. Cl. 530—387.9 **1 Claim**

1. An antibody which specifically binds with a peptide having the amino acid sequence at positions 200–221 of a human prohibitin, said human prohibitin having a sequence as recited in SEQ ID NO: 1

SEQ ID NO:1

```
TGTGGAGGTC   AGAGTGGAAG   CAGGTGTGAG
   AGGGTCCAGC   AGAAGGAAAC         ATG    GCT          56
                                   Met    Ala
                                   1

GCC    AAA    GTG    TTT    GAG    TCC
Ala    Lys    Val    Phe    Glu    Ser
              5
       ATT    GGC    AAG    TTT    GGC
       Ile    Gly    Lys    Phe    Gly
              10
              CTG    GCC    TTA    GCT    GTT          104
              Leu    Ala    Leu    Ala    Val
                     15
```

-continued
SEQ ID NO:1

```
GCA   GGA   GGC   GTG   GTG   AAC
Ala   Gly   Gly   Val   Val   Asn
      20
      TCT   GCC   TTA   TAT   AAT
      Ser   Ala   Leu   Tyr   Asn
      25
            GTG   GAT   GCT   GGG   CAC     152
            Val   Asp   Ala   Gly   His
            30

AGA   GCT   GTC   ATC   TTT   GAC
Arg   Ala   Val   Ile   Phe   Asp
35                            40
      CGA   TTC   CGT   GGA   GTG
      Arg   Phe   Arg   Gly   Val
                              45
            CAG   GAC   ATT   GTG   GTA     200
            Gln   Asp   Ile   Val   Val
                                    50

GGG   GAA   GGG   ACT   CAT   TTT
Gly   Glu   Gly   Thr   His   Phe
                        55
      CTC   ATC   CCG   TGG   GTA
      Leu   Ile   Phe   Trp   Val
                        60
            CAG   AAA   CCA   ATT   ATC     248
            Gln   Lys   Pro   Ile   Ile
                              65

TTT   GAC   TGC   CGT   TCT   CGA
Phe   Asp   Cys   Arg   Ser   Arg
                  70
      CCA   CGT   AAT   GTG   CCA
      Pro   Arg   Asn   Val   Pro
                  75
            GTC   ATC   ACT   GGT   AGC     296
            Val   Ile   Thr   Gly   Ser
                        80

AAA   GAT   TTA   CAG   AAT   GTC
Lys   Asp   Leu   Gln   Asn   Val
            85
      AAC   ATC   ACA   CTG   CGC
      Asn   Ile   Thr   Leu   Arg
            90
            ATC   CTC   TTC   CGG   CCT     344
            Ile   Leu   Phe   Arg   Pro
                  95

GTC   GCC   AGC   CAG   CTT   CCT
Val   Ala   Ser   Gln   Leu   Pro
      100
      CGC   ATC   TTC   ACC   AGC
      Arg   Ile   Phe   Thr   Ser
            105
            ATC   GGA   GAG   GAC   TAT     392
            Ile   Gly   Glu   Asp   Tyr
            110

GAT   GAG   CGT   GTG   CTG   CCG
Asp   Glu   Arg   Val   Leu   Pro
115                           120
      TCC   ATC   ACA   ACT   GAG
      Ser   Ile   Thr   Thr   Glu
                              125
            ATC   CTC   AAG   TCA   GTG     440
            Ile   Leu   Lys   Ser   Val
                              130

GTG   GCT   CGC   TTT   GAT   GCT
Val   Ala   Arg   Phe   AsP   Ala
                        135
      GGA   GAA   CTA   ATC   ACC
      Gly   Glu   Leu   Ile   Thr
                        140
            CAG   AGA   GAG   CTG   GTC     488
            Gln   Arg   Glu   Leu   Val
                              145
```

-continued
SEQ ID NO:1

```
TCC   AGG   CAG   GTG   AGC   GAC
Ser   Arg   Gln   Val   Ser   Asp
                  150
      GAC   CTT   ACA   GAG   CGA
      Asp   Leu   Thr   Gln   Arg
                  155
            GCC   GCC   ACC   TTT   GGG     536
            Ala   Ala   Thr   Phe   Gly
                  160

CTC   ATC   CTG   GAT   GAC   GTG
Leu   Ile   Leu   Asp   Asp   Val
            165
      TCC   TTG   ACA   CAT   CTG
      Ser   Leu   Thr   His   Leu
            170
            ACC   TTC   GGG   AAG   GAG     584
            Thr   Phe   Gly   Lys   Glu
                  175

TTC   ACA   GAA   GCG   GTG   GAA
Phe   Thr   Glu   Ala   Val   Glu
      180
      GCC   AAA   CAG   GTG   GCT
      Ala   Lys   Gln   Val   Ala
      185
            CAG   CAG   GAA   GCA   GAG     632
            Gln   Gln   Glu   Ala   Glu
            190

AGG   GCC   AGA   TTT   GTG   GTG
Arg   Ala   Arg   Phe   Val   Val
195                           200
      GAA   AAG   GCT   GAG   CAA
      Glu   Lys   Ala   Glu   Gln
                              205
            CAG   AAA   AAG   GCC   GCC     680
            Gln   Lys   Lys   Ala   Ala
                                    210

ATC   ATC   TCT   GCT   GAG   GGC
Ile   Ile   Ser   Ala   Glu   Gly
                        215
      GAC   TCC   AAG   GCA   GCT
      Asp   Ser   Lys   Ala   Ala
                        220
            GAG   CTG   ATT   GCC   AAC     728
            Glu   Leu   Ile   Ala   Asn
                              225

TCA   CTG   GCC   ACT   GCA   GGG
Ser   Leu   Ala   Thr   Ala   Gly
                  230
      GAT   GGC   CTG   ATC   GAG
      Asp   Gly   Leu   Ile   Glu
                  235
            CTG   CGC   AAG   CTG   GAA     776
            Leu   Arg   Lys   Leu   Glu
                        240

GCT   GCA   GAG   GAC   ATC   GCG
Ala   Ala   Glu   Asp   Ile   Ala
            245
      TAC   CAG   CTC   TCA   CGC
      Tyr   Gln   Leu   Ser   Arg
            250
            TCT   CGG   AAC   ATC   ACC     824
            Ser   Arg   Asn   Ile   Thr
                  255

TAC   CTG   CCA   GCG   GGG   CAG
Tyr   Leu   Pro   Ala   Gly   Gln
      260
      TCC   GTG   CTC   CTC   CAG
      Ser   Val   Leu   Leu   Gln
      265
                        CTG   CCC   CAG     866
                        Leu   Pro   Gln
```

-continued
SEQ ID NO:1

270

TGAGGGCCCA CCCTGCCTGC ACCTCCGCGGG
CTGACTGGG CCACAGCCCC GATGATTCTT 926
AACACAGCCT TCCTTCTGCT CCCACCCCAG
AAATCACTGT GAAATTTCAT GATTGGCTTA 986
AAGTGAAGGA AATAAAGGTA
AAATCACTTC AGAT 1020.

5,463,027

FLUORESCENCE POLARAZATION IMMUNOASSAY FOR TETRAHYDROCANNABINOIDS

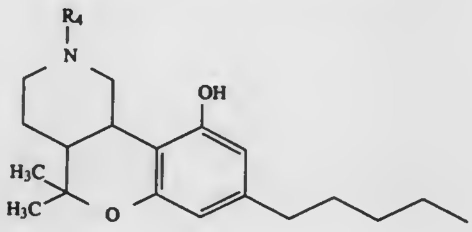
Nai-Yi Wang, Libertyville; Robert E. Dubler, Gurnee; Frank S. Ungemach, Wadsworth, all of Ill.; Roland L. Walters, Bristol, Wis., and Susan A. Thacker, Naperville, Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

Continuation of Ser. No. 114,714, Aug. 31, 1993, abandoned, which is a division of Ser. No. 938,980, Sep. 1, 1992, Pat. No. 5,264,373, which is a continuation of Ser. No. 366,266, Jun. 12, 1989, Pat. No. 5,144,030, which is a continuation-in-part of Ser. No. 14,950, Feb. 17, 1987, abandoned. This application Aug. 10, 1994, Ser. No. 288,175

Int. Cl.^{6} C07D *441/16;* **C09B** *29/033;* **C01K** *3/00*

U.S. Cl. 530—388.9 **8 Claims**

1. An immunogen comprising the structure:



wherein:

R_4 is RZQ;

RZ is amide, amidine, an alkyl, a urea, a thiourea, a carbamate, thiocarbamate or a carbonyl linkage; and

Q is a poly(amino acid), a poly(amino acid) derivative, or another immunologically active carrier.

5,463,028

REAGENTS FOR GENERATING A POLYCLONAL HYDROLYTIC ANTIBODY RESPONSE AGAINST COCAINE AND THE MONOCLONAL HYDROLYTIC ANTIBODIES AGAINST COCAINE DERIVED THROUGH THESE REAGENTS

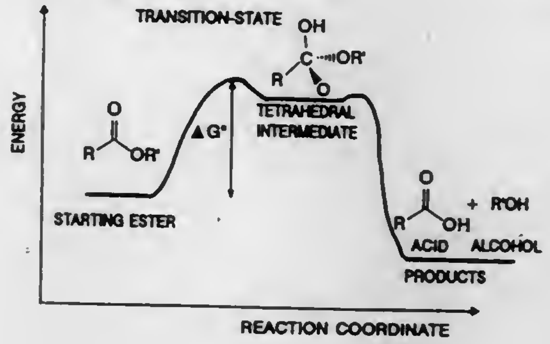
Donald W. Landry, and Kang Zhao, both of New York, N.Y., assignors to The Trustees of Columbia University in the City of New York, New York, N.Y.

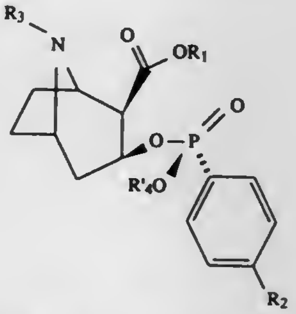
Filed Apr. 3, 1992, Ser. No. 862,801

Int. Cl.^{6} C07K *17/02;16/46*

U.S. Cl. 530—405 **11 Claims**

1. A compound having the structure:





wherein each of R_1, R_2, R_3 or R_4 is independently hydrogen, or a lower alkyl; or

wherein one but only one of R_1, R_2 or R_3 is an alkyl azide group, a lower alkyl amine, a group comprising a lower alkyl group linked to a lower alkyl caboxylic acid or derivative, with each of the remaining two of R_1, R_2 or R_3 is independently hydrogen or a lower alkyl and R_4 is hydrogen, a lower alkyl or a negative charge.

5,463,029

PURIFICATION OF FUSION PROTEINS COMPRISING GM-CSF AND IL-3

Joseph T. Dunn, Woodinville, and Stephen M. Waugh, Seattle, both of Wash., assignors to Immunex Corporation, Seattle, Wash.

Filed Nov. 23, 1992, Ser. No. 979,949

Int. Cl.^{6} C07K *1/18;19/00;* **C12N** *15/24;15/27*

U.S. Cl. 530—416 **20 Claims**

1. A method for purifying a recombinant fusion protein comprising ganulocyte-nacrophage colony stimluating factor (GM-CSF) and Interfusion-3(IL-3) from an aqueous solution, consisting essentially of the steps of:

(a) adsorbing the recombinant fusion protein to a cation exchange resin;

(b) eluting the recombinant fusion protein from the cation exchange resin;

(c) adsorbing the recombinant fusion protein from step (b) to a first anion exchange resin;

(d) eluting the recombinant fusion protein from the first anion exchange resin;

(e) adsorbing the recombinant fusion protein from step (d) to a second anion exchange resin; and

(f) eluting the recombinant fusion protein from the second anion exchange resin.

5,463,030
METAL CHELATING AGENTS FOR MEDICAL APPLICATION

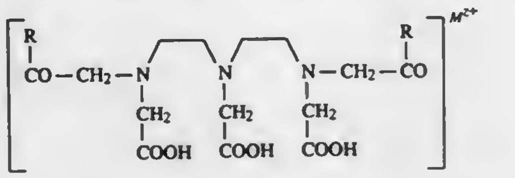
Gopal Subramanian, Manlius, and Richard F. Schneider, Syracuse, both of N.Y., assignors to Research Foundation of the State of New York, Albany, N.Y.

Continuation of Ser. No. 695,207, May 3, 1991, abandoned. This application May 31, 1994, Ser. No. 251,633

Int. Cl.⁶ C07F *5/00;* **A61K** *49/00;51/04*

U.S. Cl. 534—16 **5 Claims**

1. A complex comprising the following formula



a nitrogen containing radical selected from a para-amino hippuric acid radical, a substituted para-amino hippuric acid radical, a substituted anilino radical, a substituted benzylamino radical or a substituted phenethylamino radical in which the phenyl group of said radicals are independently substituted with amino propanediol or erythritol wherein the nitrogen of the nitrogen containing radicals represented by R is linked to the carbon of the carbonyl group forming an amide linkage and wherein M is a paramagnetic ion selected from the group of elements having atomic numbers of 57–71 and z is a valence of 2+ or 3+.

5,463,031
REACTIVE DYESTUFFS

Horst Jäger, Leverkusen; Frank-Michael Stöhr, Odenthal, and Karl K. Schündehütte, Leverkusen, all of, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

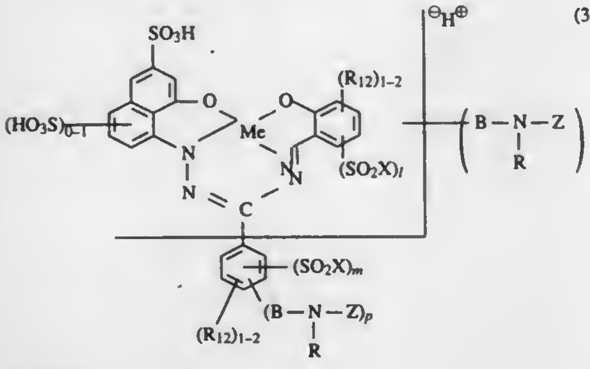
Continuation of Ser. No. 710,244, Jun. 3, 1991, abandoned, which is a continuation of Ser. No. 359,802, May 31, 1989, abandoned. This application Apr. 12, 1994, Ser. No. 226,435

Claims priority, application Germany, Jun. 10, 1988, 38 19 752.9

Int. Cl.⁶ C09B *62/503;62/04;62/20;* **D06P** *1/38*

U.S. Cl. 534—618 **3 Claims**

1. A reactive dyestuff of the formula



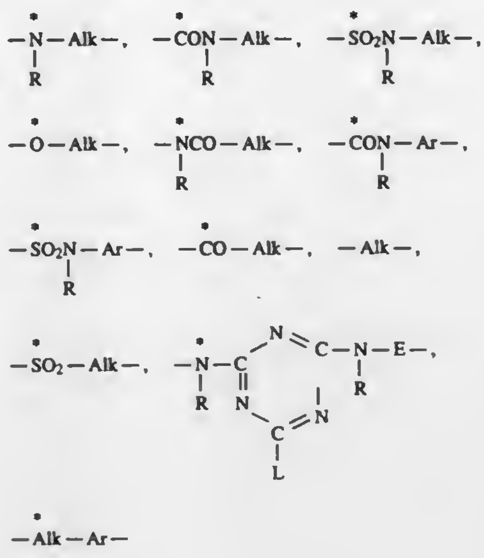
(37)

in which

X is $CH{=}CH_2$ or CH_2CH_2—Y in which

Y is a radical which can be eliminated by alkali,

B is a direct bond or a bridge member selected from the group consisting of



or in which

* indicates the point of linkage with the phenyl ring

Alk is a straight-chain or branched C_1–C_6-alkylene which is uninterrupted or interrupted by a heteroatom or a grouping which contains a heteroatom,

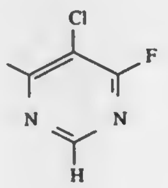
Ar is substituted or unsubsituted phenylene or naphthylene or the radical of a diphenyl or stilbene,

E is Alk or Ar of-Alk-Ar- in which Alk or Ar contain no further substituents, or contain as a substitutent F, Cl, Br, C_1–C_4-alkyl, C_1–C_4-alkoxy, carboxyl or sulpho,

L is F, Cl, Br, amino, OH, C_1–C_4-alkoxy, phenoxy or C_1–C_4-alkylthio,

R is H or unsubstituted C_1–C_4-alkyl, or C_1–C_4-alkyl substituted by halogen, hydroxyl, cyano, C_1–C_4-alkoxy, carboxy or sulfo,

Z is a fiber reactive radical of the formula



(2)

and

R_{12} denotes H, C_1–C_4-alkyl, C_1–C_4-alkoxy, OH, halogen, COOH, NO_2, SO_3H, sulphonamido, C_1–C_4-alkylcarbonylamino, phenylcarbonylamino, C_1–C_4-alkylsulphonylamino or phenylsulphonylamino,

l, m, p denote 0 or one where l≠m, m≠p, and

Me is Fe, Cu or Ni.

5,463,032

BISAZO COMPOUNDS AND METHOD FOR DYEING OR PRINTING FIBER MATERIALS USING THE SAME

Kingo Akahori, Toyonaka; Yoshiteru Ohta, Ibaraki; Takashi Omura, Kobe; Mahito Fujita, and Naoki Harada, both of Ibaraki, all of, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

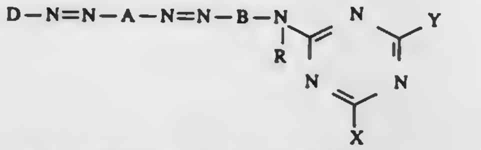
Filed Nov. 23, 1993, Ser. No. 155,834

Claims priority, application Japan, Dec. 4, 1992, 4-350750

Int. Cl.^{6} C09B ***62/513;*** **D06P** ***1/384***

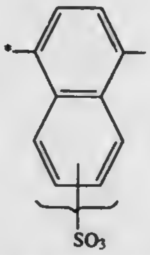
U.S. Cl. 534—642 **12 Claims**

1. A bisazo compound represented by the formula (I),



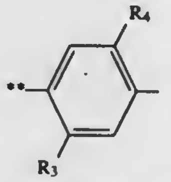
(I)

wherein R is hydrogen or unsubstituted or substituted lower alkyl; D is unsubstituted or substituted phenyl or unsubstituted or substituted naphthyl; A is a group represented by the formula (2),

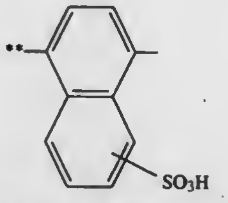


(2)

wherein the mark * indicates a bond linking to D—N=N—; B is a group represented by the formula (3) or (4),

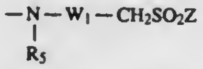


(3)

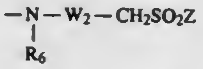


(4)

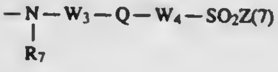
wherein R_3 is hydrogen, C_1–C_4 alkyl, C_1–C_4 alkoxy, C_{1-C4} acylamino or ureido, R_4 is hydrogen, C_1–C_4 alkyl or C_1–C_4 alkoxy, and the mark ** indicates a bond linking to —A—N=N—; Y is a group represented by the formula (5), (6), (7) or (8),



$$-\underset{R_5}{N}-W_1-CH_2SO_2Z \qquad (5)$$

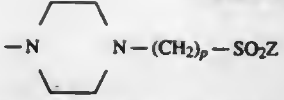


$$-\underset{R_6}{N}-W_2-CH_2SO_2Z \qquad (6)$$



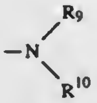
$$-\underset{R_7}{N}-W_3-Q-W_4-SO_2Z(7)$$

-continued

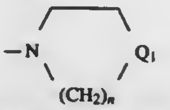


(8)

wherein R_6 is hydrogen or unsubstituted or substituted lower alkyl, W_2 is linear or branched C_1–C_5 alkylene unsubstituted or substituted with halogeno, hydroxy, sulfato, carboxy, cyano, C_1–C_4 alkylcarbonyloxy, C_1–C_4 alkoxycarbonyl, carbamoyl or $—SO_2Z$, Z is $—CH{=}CH_2$ or $—CH_2CH_2Z_1$, in which Z_1 is a group capable of being split by the action of an alkali, W_1 is linear or branched C_1–C_5 alkylene, R_5 is hydrogen, unsubstituted or substituted lower alkyl or $—W_2—CH_2SO_2Z$, in which W_2 and Z are as defined above, W_3 and W_4 are independently linear or branched C_2–C_6 alkylene, R_7 is hydrogen or unsubstituted or substituted lower alkyl, Q is —O— or $—NR_8—$, in which R_8 is hydrogen or C_1–C_4 alkyl, and p is an integer of 1–6; and X is a group represented by the formula (9) or (10),



(9)



(10)

wherein R_9 is hydrogen or alkyl unsubstituted or substituted with C_1–C_4 alkoxy, sulfo, carboxy, hydroxy or sulfato, R_{10} is hydrogen, alkyl unsubstituted or substituted with C_1–C_4 alkoxy, sulfo, carboxy, hydroxy or sulfato, unsubstituted or substituted phenyl or C_5–C_7 cycloalkyl, n is 1 or 2, and Q_1 is —O—, —S—, $—CH_2—$, $—SO_2—$ or $NR_{11}—$, in which R_{11} is hydrogen or C_1–C_4 alkyl; with the proviso that at least one of D, A, B and X has sulfo.

5,463,033

FIBER REACTIVE MONOAZO YELLOW DYE

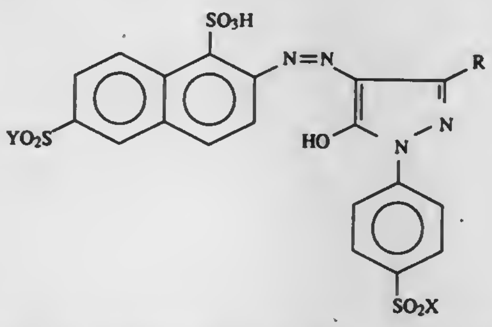
John W. Donovan, Greene, R.I., and Frank P. Lavieri, Foxboro, Mass., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Continuation of Ser. No. 144,591, Oct. 28, 1993, abandoned, which is a continuation of Ser. No. 867,260, Apr. 10, 1992, abandoned. This application Jul. 13, 1994, Ser. No. 274,567

Int. Cl.^{6} C09B ***62/51;*** **D06P** ***1/384***

U.S. Cl. 534—642 **6 Claims**

1. A compound of the formula:



X and Y are independently a vinyl group, or a fiber reactive group of the general formula $—CH_2CH_2—Z$ wherein Z is chloro, sulfato, thiosulfato or phosphato, and R is C_1–C_4 alkyl.

5,463,034

POLYSACCHARIDES, PROCESS FOR THEIR PREPARATION AND THEIR USE

Hans-Josef Buysch; Alexander Klausener, both of Krefeld; Klaus Szablikowski; Klaus Balser, both of Walsrode, and Michaela Wilke, Schneverdingen, all of, Germany, assignors to Wolff Walsrode Aktiengesellschaft, Walsrode, Germany

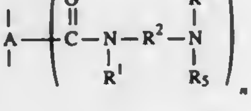
Filed Oct. 13, 1989, Ser. No. 421,411

Claims priority, application Germany, Jan. 27, 1988, 38 36 599.5

Int. Cl.^{6} C07H *15/00;* **A61K** *31/715;* **C08B** *15/06*

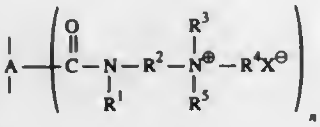
U.S. Cl. 536—17.2 **5 Claims**

1. Polysaccharides containing recurring units I or a salt Ia thereof



$$A\left(-\overset{O}{\overset{\|}{C}}-\underset{R^1}{\underset{|}{N}}-R^2-\overset{R^3}{\overset{|}{\underset{R_5}{\underset{|}{N}}}}\right)_n$$

I



$$A\left(-\overset{O}{\overset{\|}{C}}-\underset{R^1}{\underset{|}{N}}-R^2-\overset{R^3}{\overset{|}{\underset{R^5}{\underset{|}{N^{\oplus}}}}}-R^4X^{\ominus}\right)_n$$

Ia

wherein

A denotes a glucose or pentose monosaccharide unit,

R^1 denotes H or C_1–C_4-alkyl,

R^2 denotes an alkylene radical or an alkylene radical which is interrupted by an O or N atom,

R^3 and R^4 are identical or different and denote hydrogen, a C_1–C_{18}-alkyl radical or C_5–C_6-cycloalkyl radical, a C_1–C_{18}-alkyl radical or C_5–C_6-cycloalkyl radical which is substituted by OH or OR^1, benzyl or (meth)allyl.

R^5 denotes a C_1–C_{18}-alkyl radical or C_5–C_6-cycloalkyl radical, a C_1–C_{18}-alkyl radical or C_5–C_6-cycloalkyl radical which is substituted by OH or OR^1, or aryl,

n denotes a number from 0.8 to 3.0 and

$X^{\ominus}$ denotes a chloride, bromide, iodide, sulphate, toluenesulphonate or methanesulphonate anion, or

R^1 and R^5 together with R^2 and the two N atoms can denote a ring, or

R^3 and R^5 together with the N atom can denote a ring.

5,463,035

PROCESS FOR PURIFYING PENTOSTATIN

James C. French, Ann Arbor, Mich.; Colin R. Edmunds, Abergavenny; Peter McDonnell, Caerleon Gwent, both of, United Kingdom, and Howard D. H. Showalter, Ann Arbor, Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation of Ser. No. 224,392, Apr. 7, 1994, abandoned, which is a continuation of Ser. No. 738,715, Jul. 31, 1991, abandoned. This application Feb. 28, 1995, Ser. No. 396,443

Int. Cl.^{6} C07H *19/23;19/04*

U.S. Cl. 536—55.3 **6 Claims**

1. A process for isolating pentostatin from a fermentation beer, the process comprising the following steps:

a) applying the fermentation beer to a strong cation exchange resin;

b) eluting the strong cation exchange resin with ammonium hydroxide;

c) concentrating the eluate;

d) adding ethanol and acetone to the concentrated eluate to form a solution;

e) collecting and concentrating the supernatant;

f) applying the concentrated supernatant to a strongly basic anion exchange resin charged with borate ion;

g) eluting the strongly basic anion exchange resin charged with borate ion with water;

h) applying the eluted solution to an activated bed of styrene-divinylbenzene beads prewashed with aqueous ethanol;

i) washing the bed of styrene-divinylbenzene beads with water;

j) eluting the bed of styrene-divinylbenzene beads with ethanol/water;

k) collecting fractions containing pentostatin; and

l) recrystallizing the pentostatin using water and methanol to obtain pentostatin having a purity of greater than 99.7%.

5,463,036

CARBOXYMETHYLCELLULOSE AND ITS USE IN TEXTILE PRINTING

Reinhard Kniewske, Fallingbostel; René Kiesewetter, Soltau-Ahlften; Eugen Reinhardt, and Klaus Szablikowski, Walsrode, all of, Germany, assignors to Wolff Walsrode Aktiengesellschaft, Walsrode, Germany

Filed Nov. 18, 1993, Ser. No. 154,767

Claims priority, application Germany, Nov. 25, 1992, 42 39 553.4

Int. Cl.^{6} C08B *11/12;* **C09D** *11/14;* **D06P** *1/38*

U.S. Cl. 536—86 **9 Claims**

1. Carboxymethylcellulose (CMC) having a degree of substitution of from 1.3 to 2.2, prepared by a two-stage process with grinding after the first stage, in which the powder ground after the first. stage has a particle size distribution of 100% ≦2.0 mm.

5,463,037

PROCESS FOR PRODUCING MIXED CELLULOSE ETHER

Atsunobu Kiyose, Hyogo, Japan, and Yonosuke Kato, Singapore, Singapore, assignors to Daicel Chemical Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 967,385, Oct. 28, 1992, abandoned. This application Jun. 1, 1994, Ser. No. 252,537

Claims priority, application Japan, Jan. 29, 1991, 3-282881

Int. Cl.^{6} C08B *11/193;11/20*

U.S. Cl. 536—90 **7 Claims**

1. A process for producing a mixed cellulose ether comprising reacting a starting cellulose ether containing an alkyl substituent having a carbon number of from 1 to 3 with an etherifying agent either successively or continuously, wherein said starting cellulose ether comprises at least 18 mol % of a 6-substituted glucose unit and at least 15 mol % of an unsubstituted glucose unit.

5,463,038

METHOD OF PRODUCING KESTOSE CRYSTALS

Tetsuhiro Hidano; Hiroyuki Takeda; Masayuki Tsukada; Kazuo Yamamoto, and Atsushi Inoue, all of Hokkaido, Japan, assignors to The Hokuren Federation of Agricultural Cooperatives, Japan

Continuation of Ser. No. 738,626, Jul. 31, 1991, abandoned. This application Sep. 4, 1992, Ser. No. 940,788

Claims priority, application Japan, Aug. 28, 1990, 224312

Int. Cl.^{6} C07H *1/06;3/06;* **C12P** *19/44*

U.S. Cl. 536—124 **3 Claims**

1. A method of producing prismatic 1-kestose crystals having a purity of at least 95% comprising:

(a) providing a crude aqueous solution of 1-kestose having a purity of at least 70%;

(b) concentrating said crude aqueous solution to at least °B_x 85;

(c) heating the concentrated crude aqueous solution to a temperature of at least 80° C.;

(d) adding a liquid suspension of seed crystals to the concentrated crude aqueous solution at a temperature of at least 80° C.;

(e) gradually cooling the concentrated crude aqueous solution with added seed crystals to 65°–75° C. to grow said 1-kestose crystals of at least 95% purity; and

(f) separating said prismatic 1-kestose crystals of at least 95% purity while maintaining the solution at a temperature of 60°14 80° C.

5,463,039

METHOD OF PREPARING HETERO-BRANCHED CYCLODEXTRINS

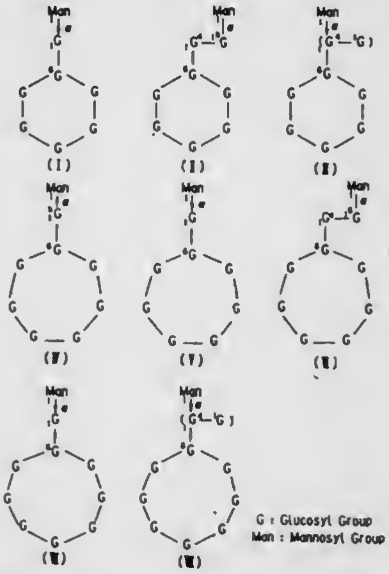
Koji Hara; Koki Fujita, both of Yokohama; Nobuhiro Kuwahara, Yokohama; Sumio Kitahata, and Kyoko Koizumi, both of Osaka, all of, Japan, assignors to Ensuiko Sugar Refining Co., Ltd., Kanagawa; Osaka-shi, and Kyoko Koizumi, both of Osaka, all of, Japan

Division of Ser. No. 958,579, Oct. 8, 1992, Pat. No. 5,356,884. This application Jun. 21, 1994, Ser. No. 263,124

Claims priority, application Japan, Nov. 13, 1991, 3-24021

Int. Cl.⁶ C08B *37/16;* C08L *5/16*

U.S. Cl. 536—124 **8 Claims**



1. A method of preparing a hetero-branched cyclodextrin comprising a glucosyl or a maltosyl group side chain and a mannosyl group α-bonded to a hydroxyl group of the glucosyl group or the maltosyl group of the side chain, the method comprising contacting a liquid containing a branched cyclodextrin having a glucosyl or maltosyl group as the side chain and an α-mannosyl compound with an α-mannosyl transfer enzyme under the conditions of a pH of 3 to 10, a temperature of 20° to 70° C. and a contacting time of 5 to 100 hours, and isolating the resulting hetero-branched cyclodextrin.

5,463,040

METHOD OF PREPARING ETOPOSIDE

Calvin Vogel, Netanya, Israel, assignor to Teva Pharmaceutical Industries, Ltd., Netanya, Israel

Filed Jun. 28, 1994, Ser. No. 266,923

Int. Cl.⁶ A61K *51/70;* C07H *15/20;15/26*

U.S. Cl. 536—124 **37 Claims**

1. A method of preparing etoposide comprising:

providing a residue obtained by removing a first amount of etoposide from a reaction mixture produced by reacting etoposide triacetate with a first lower alkanol in the presence of a first transesterification catalyst; and

reacting said residue with a second lower alkanol and a second trans-esterification catalyst.

5,463,041

PROCESS FOR PREPARING PURIFIED HYDROXYMETAL PHTHALOCYANINE AND ELECTROPHOTOGRAPHIC PHOTORECEPTOR USING THE SAME

Katsumi Nukada, and Katsumi Daimon, both of Ashigara, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Jun. 14, 1993, Ser. No. 76,100

Claims priority, application Japan, Jun. 17, 1992, 4-181618

Int. Cl.⁶ C09B *67/12*

U.S. Cl. 540—139 **17 Claims**

1. A process for preparing a purified hydroxy metal phthalocyanine comprising dissolving or slurrying a precursor of a hydroxymetal phthalocyanine in an acid, precipitating a hydroxymetal phthalocyanine in a solvent or a basic solution, and in an immediate next washing step, heat treating the resulting hydroxymetal phthalocyanine in a solvent having dissolved therein a base.

5,463,042

POLYARYL-METALLIC COMPLEX INTERCALATED LAYERED DOUBLE HYDROXIDES

Thomas J. Pinnavaia, East Lansing, Mich.; Elena M. Perez-Bernal; Ricardo Ruarno-Casero, both of Salamanca, Spain, and Malama Chibwe, East Lansing, Mich., assignors to Board of Trustees operating Michigan State University, East Lansing, Mich.

Division of Ser. No. 981,603, Nov. 25, 1992, Pat. No. 5,302,709. This application Jan. 25, 1994, Ser. No. 186,109

Int. Cl.⁶ C07C *321/14;* C09B *47/04*

U.S. Cl. 540—139 **15 Claims**

1. A method for catalytically oxidizing an oxidizable organic compound which comprises:

(a) providing a crystalline layered double hydroxide (LDH) metal complex which comprises:

$$[M''_{1-x}M'''x(OH)_2](A^{n-})_{x/n}\cdot yH_2O$$

as spaced apart hydroxide host layers wherein M'' is a divalent metal cation selected from the group consisting of Co^{2+}, Ni^{2+}, Zn^{2+}, Mg^{2+}, Cu^{2+}, Ca^{2+}, and Fe^{2+}, M''' is a trivalent metal cation selected from the group consisting of Cr^{3+}, Al^{3+}, and Fe^{3+}, A^{n-} is an intercalated anionic polyaryl metal complex wherein the polyaryl is selected from the group consisting of a phthalocyanine, a porphyrin and a salicyl Schiff's base and wherein the metal in the polyaryl metal complex is selected from the group consisting of a Group VIIB and metal, metals from cobalt and iron triads of Group VII and mixtures thereof wherein the polyaryl metal complex has a disc-like shape wherein the disc defines a plane across the disc-like shape with the plane of the complex such that the disc-like shape is approximately orthogonal to a plane of the spaced apart hydroxide host layers which have a basal spacing between the host layers greater than approximately 18 Å and x is between about 0.17 and 0.37, y is a positive number representing bound water, intermixed with the oxidizable compound in a solution in the presence of oxygen; and

(b) adjusting the temperature of the solution so that the metal complex oxidizes the oxidizable compound at a suitable rate.

5,463,043

PROCESS FOR PRODUCING A DICHLOROTIN PHTHALOCYANINE CRYSTAL

Katsumi Nukada; Akira Imai; Katsumi Daimon; Masakazu Iijima; Kiyokazu Mashimo; Yasuo Sakaguchi, and Ichiro Takegawa, all of Minami-ashigara, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Division of Ser. No. 1,515, Jan. 6, 1993, Pat. No. 5,338,626, which is a continuation-in-part of Ser. No. 948,482, Sep. 22, 1992, abandoned. This application May 10, 1994, Ser. No. 240,483

Claims priority, application Japan, Sep. 27, 1991, 3-274872; Jan. 13, 1992, 4-21683; Jan. 20, 1992, 4-027448

Int. Cl.^{6} C09B *47/04*

U.S. Cl. 540—141 **11 Claims**

1. A process for producing a dichlorotin phthalocyanine crystal having distinct diffraction peaks at 8.5°, 11.2°, 14.5°, and 27.2° of the Bragg angles ($2\theta\pm0.2$) in the X-ray diffraction spectrum, which comprises mechanically grinding dichlorotin phthalocyanine together with an inorganic salt.

5,463,044

PROCESS FOR PREPARING CHLOROGALLIUM PHTHALOCYANINE CRYSTAL

Katsumi Nukada; Akira Imai, and Masakazu Iijima, all of Minami Ashigara , Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Aug. 18, 1993, Ser. No. 107,977

Claims priority, application Japan, Aug. 26, 1992, 4-248933

Int. Cl.^{6} C09B *67/50;47/067;47/073*

U.S. Cl. 540—143 **18 Claims**

1. A process for preparing chlorogallium phthalocyanine comprising the steps of:

reacting gallium trichloride and phthalonitrile or diiminoisoindoline in a halogenated aromatic hydrocarbon solvent having a boiling point of not lower than 150° C.; and treating the resulting chlorogallium phthalocyanine with a second solvent different from said halogenated aromatic hydrocarbon solvent.

5,463,045

DYES AND DYE-DONOR ELEMENTS FOR THERMAL DYE TRANSFER RECORDING

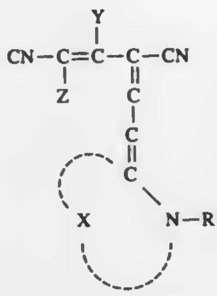
Wilhelmus Janssens, Aarschot, and Luc Vanmaele, Lochristi, both of, Belgium, assignors to AGFA-Gevaert, N.V., Mortsel, Belgium

Division of Ser. No. 44,041, Apr. 8, 1993, Pat. No. 5,324,621. This application May 25, 1994, Ser. No. 248,726

Int. Cl.^{6} C07D *215/16;209/02*

U.S. Cl. 546—158 **2 Claims**

1. Dye corresponding to the following general formula (I):



(I)

wherein:

R^1 represents hydrogen, a C_1–C_6 alkyl group, a substituted C_1–C_6 alkyl group, a cycloalkyl group, a substituted cycloalkyl group, an aryl group, or a substituted aryl group,

X represents the atoms needed to complete a polycyclic heterocyclic ring system consisting of a phenyl ring fused to a 5-membered N-heterocyclic ring optionally having one additional heteroatom selected from the group consisting of N, O and S,

Z represents an electron-withdrawing group,

Y represents an electron-withdrawing group or $—N(R^2)R^3$,

R^2 and R^3 have a significance chosen from the following alternatives (1), (2) and (3):

(1) R^2 and R^3 together represent the atoms needed to complete a heterocyclic nucleus, a substituted heterocyclic nucleus, a heterocyclic nucleus carrying a fused-on cycloaliphatic, aromatic, or heterocyclic ring or ring system, or a substituted heterocyclic nucleus carrying a fused-on cycloaliphatic, aromatic, or heterocyclic ring or ring system, or

(2) R^2 and R^3 together represent the group $=C(R^4)R^5$, or

(3) each of R^2 and R^3, in case they together do not have any of the significances identified under (1) and (2) hereinbefore, represents (same or different) an alkyl group, a substituted alkyl group, a cycloalkyl group, a substituted cycloalkyl group, an aryl group, a substituted aryl group, or an electron-withdrawing group, in case (3) at least one of R^2 and R^3 being an electron-withdrawing group,

each of R^4 and R^5 (same or different) represents hydrogen, an alkyl group, a substituted alkyl group, a cycloalkyl group, a substituted cycloalkyl group, an aryl group, a substituted aryl group, a heterocyclic nucleus, a substituted heterocyclic nucleus, SO_2R^6, COR^6, CSR^6, POR^6R^7, OR^8, NR^8R^9, SR^8, or R^4 and R^5 together represent the atoms necessary to complete an aliphatic ring, a substituted aliphatic ring, a heterocyclic nucleus, a substituted heterocyclic nucleus, a heterocyclic nucleus carrying a fused-on cycloaliphatic, aromatic, or heterocyclic ring or ring system, or a substituted heterocyclic nucleus carrying a fused-on cycloaliphatic, aromatic, or heterocyclic ring or ring system,

each of R^6 and R^7 (same or different) represents an alkyl group, a substituted alkyl group, a cycloalkyl group, a substituted cycloalkyl group, an alkenyl group, a substituted alkenyl group, an aryl group, a substituted aryl group, an alkyloxy group, a substituted alkyloxy group, an aryloxy group, a substituted aryloxy group, an alkylthio group, a substituted alkylthio group, an arylthio, a substituted arylthio group, an amino group, a substituted amino group, a heterocyclic nucleus, or a substituted heterocyclic nucleus, or R^6 and R^7 together represent the atoms necessary to complete a 5- or 6-membered nucleus, and

each of R^8 and R^9 (same or different) represents an alkyl group, a substituted alkyl group, a cycloalkyl group, a substituted cycloalkyl group, an alkenyl group, a substituted alkenyl group, an aralkyl group, a substituted aralkyl group, an aryl group, a substituted aryl group, a heterocyclic nucleus, or a substituted heterocyclic nucleus, or R^8 and R^9 together represent the atoms necessary to complete a 5- or 6-membered nucleus.

5,463,046

1-β-METHYL-2-THIOLIC CARBAPENEM DERIVATIVES

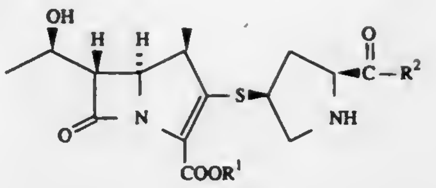
Jung H. Cho, Seoul; Chang H. Oh, Kyeonggi, and Ki H. Nam, Seoul, all of, Rep. of Korea, assignors to Dong Kook Pharmaceutical Co., Ltd., and Ki-Beom Kwon, both of Seoul, Rep. of Korea

Filed Nov. 19, 1993, Ser. No. 155,477

Int. Cl.^{6} C07D *487/04;* **A61K** *31/40*

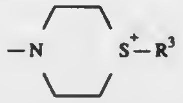
U.S. Cl. 540—350 **3 Claims**

1. 1-β-methyl-2-thiolic carbapenem derivatives having the following formula (I):

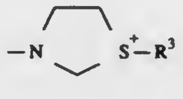


(I)

in the formula (I), R^1 denotes anion and R^2 denotes N-(S-alkylthiomorpholinylium) of following formula ① or N-(S-alkylthiazolium) cation of following formula ②,



1



2

(In the above formula ① and ②, R^3 denotes methyl or low alkyl group of C_2–C_4).

5,463,047

INTERMEDIATES FOR THE MANUFACTURE OF 4-ACYLOXY-3-HYDROXYETHYLAZETIDINONES

Peter Schneider, Bottmingen; Gerardo Ramos, Arlesheim, and Jacques Bersier, Riehen, all of, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

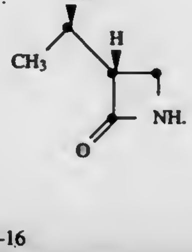
Division of Ser. No. 92,736, Jul. 16, 1993, Pat. No. 5,386,029, which is a division of Ser. No. 740,685, Aug. 6, 1991, Pat. No. 5,274,188, which is a division of Ser. No. 491,145, Mar. 9, 1990, Pat. No. 5,064,761, which is a division of Ser. No. 186,547, Apr. 27, 1988, Pat. No. 4,927,507. This application Sep. 15, 1994, Ser. No. 306,863

Claims priority, application Switzerland, May 4, 1987, 1683/87

Int. Cl.⁶ C07D ***205/08***

U.S. Cl. 540—362 **1 Claim**

1. The compound of formula



(V)

5,463,048

RAPAMYCIN AMIDINO CARBAMATES

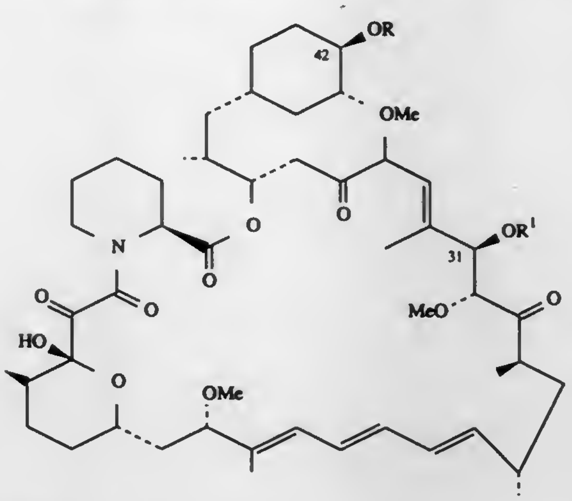
Jerauld S. Skotnicki, Allentown, N.J., and Yvette L. Palmer, Newtown, Pa., assignors to American Home Products Corporation, Madison, N.J.

Filed Jun. 14, 1994, Ser. No. 259,763

Int. Cl.⁶ A61K ***31/395;*** **C07D** ***498/16***

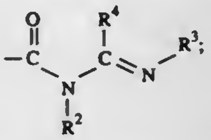
U.S. Cl. 540—456 **4 Claims**

1. A compound of the structure



wherein

R and R^1 are each, independently, hydrogen, or



$$-\overset{O}{\overset{\|}{C}}-\underset{\underset{R^2}{|}}{N}-\overset{\overset{R^4}{|}}{C}=N-R^3;$$

- R^2 and R^3 are each, independently, hydrogen, alkyl of 1–6 carbon atoms, alkenyl of 2–7 carbon atoms, alkynyl of 2–7 carbon atoms, $—CO_2R^5$, $—COR^5$, —CN, $—NO_2$, $—SO_2R^5$, $—SO_3R^5$, $—OR^5$, $—SR^5$, or Ar;
- R^4 is hydrogen, alkyl of 1–6 carbon atoms, alkenyl of 2–7 carbon atoms, alkynyl of 2–7 carbon atoms, $—CF_3$, $—NR^5R^6$, $—CO_2R^5$, $—COR^5$, $CONR^5R^6$, $—NO_2$, halogen, $—OR^5$, $—SR^5$, —CN, $—SO_2R^5$, $—SO_3R^5$, $—SO_2NR^5R^6$, or Ar;
- R^5 and R^6 are each, independently, hydrogen, alkyl of 1–6 carbon atoms, alkenyl of 2–7 carbon atoms, alkynyl of 2–7 carbon atoms, or Ar;
- Ar is phenyl, naphthyl, or furanyl, thiophenyl, pyrrolyl, pyrazolyl, imidazolyl, 1,2,3-triazolyl, 1,2,4-triazolyl, 1,2-dithiolyl, 1,3-dithiolyl, 1,2,3-oxathiolyl, isoxazolyl, oxazolyl, thiazolyl, isothiazolyl, 1,2,3-oxadiazolyl, 1,2,5-oxadiazolyl, 1,3,4-oxadiazolyl, 1,2,3,4-oxatriazolyl, 1,2,3,5-oxatriazolyl, 1,2,3-dioxazolyl, 1,2,4-dioxazolyl, 1,3,2-dioxazolyl, 1,3,4-dioxazolyl, 1,2,5-oxathiazolyl, 1,3-oxathiolyl, 1,2-pyranyl, 1,4-pyranyl, pyridinyl, pyridazinyl, pyrimidinyl, pyrazinyl, 1,3,5-triazinyl, 1,2,4-triazinyl, 1,2,3-triazinyl, 1,2,4-oxazinyl, 1,3,2-oxazinyl, 1,2,6-oxazinyl, 1,4-oxazinyl, isoxazinyl, 1,2,5-oxathiazinyl, 1,4-oxazinyl, o-isoxazinyl, p-isoxazinyl, 1,2,5-oxathiazinyl, 1,2,6-oxathiazinyl, 1,3,5,2-oxadiazinyl, azepinyl, oxepinyl, thiepinyl, 1,2,4-diazepinyl, benzofuranyl, isobenzofuranyl, thionapthenyl, indolyl, indolenyl, 2-isobenzazolyl, 1,5-pyrindinyl, pyrano[3,4-b]pyrrolyl, benzpyrazolyl, benzisoxazolyl, benzoxazolyl, anthranilyl, 1,2-benzopyranyl, quinolinyl, isoquinolinyl, cinnolinyl, quinazolinyl, naphthyridinyl, pyrido[3,4-b]pyridinyl, pyrido[4,3-b]pyridinyl, pyrido[2,3-b]pyridinyl, 1,3,2-benzoxazinyl, 1,4,2-benzoxazinyl, 2,3,1-benzoxazinyl, 3,1,4-benzoxazinyl, 1,2-benzisoxazinyl, 1,4-benzisoxazinyl, carbazolyl, and puri-

nyl, wherein the foregoing may be optionally mono-, di-, or tri-substituted with a group selected from alkyl of 1–6 carbon atoms, alkenyl of 2–7 carbon atoms, alkynyl of 2–7 carbon atoms, arylalkyl of 7–10 carbon atoms, alkoxy of 1–6 carbon atoms, cyano, halo, hydroxy, nitro, carbalkoxy of 2–7 carbon atoms, trifluoromethyl, trifluoromethoxy, amino, dialkylamino of 1–6 carbon atoms per alkyl group, dialkylaminoalkyl of 3–12 carbon atoms, hydroxyalkyl of 1–6 carbon atoms, alkoxyalkyl of 2–12 carbon atoms, alkylthio of 1–6 carbon atoms, —SO_3H, and —CO_2H;

with the proviso that R and R^1 are both not hydrogen, or a pharmaceutically acceptable salt thereof.

5,463,049

PROCESS FOR PREPARING ENANTIOMERICALLY PURE IMIDAZO[4,5,1-JK][1,4]-BENZODIAZEPIN-2(1H)-THIONES

Alfons G. M. De Knaep, Turnhout; Luc J. R. Moens, Lille, and Eduard J. C. Vreysen, Mol, all of, Belgium, assignors to Janssen Pharmaceutica N.V., Beerse, Belgium

PCT No. PCT/EP92/02171, § 371 Date Feb. 15, 1994, § 102(e) Date Feb. 15, 1994, PCT Pub. No. WO93/06106, PCT Pub. Date Apr. 1, 1993

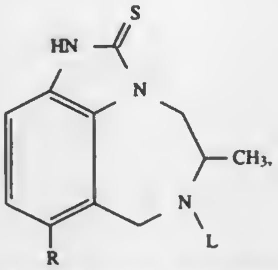
PCT Filed Sep. 18, 1992, Ser. No. 196,168

Claims priority, application European Pat. Off., Sep. 24, 1991, 9120247

Int. Cl.⁶ C07D *487/04*

U.S. Cl. 540—556 **10 Claims**

1. A process for preparing an enantiomerically pure 8-halo-4,5,6,7-tetrahydro-5-methylimidazo[4,5,1-jk] [1,4]benzodiazepin-2-(1H)-thione of the formula:



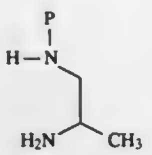
(I)

or a pharmaceutically acceptable acid addition salt form thereof, wherein:

R represents halo; and L represents C_{3-7}alkenyl,

wherein said process comprises the steps of:

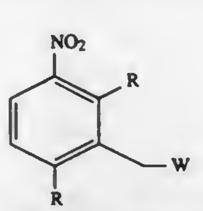
(a) selectively protecting enantiomerically pure 1,2-diaminopropane by reaction with a protecting group of the formula P—W wherein P represents a protecting group selected from the group consisting of sulfonyl and acyl, and W represents a reactive leaving group selected from the group consisting of halo and sulfonyloxy, to produce an intermediate of Formula (III):



(III)

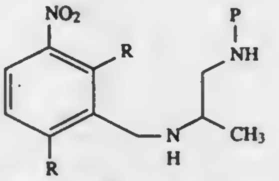
wherein P is as defined above:

(b) reacting a 2,6-dihalo-3-nitrobenzyl derivative of the formula:



(II)

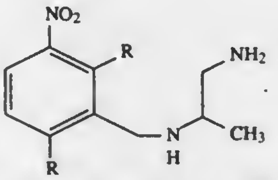
wherein R represents halo and W represents a reactive leaving group selected from the group consisting of halo and sulfonyloxy, with an enantiomerically pure N^1-protected 1,2-diaminopropane derivative of Formula (III) in an inert reaction vehicle in the presence of a base, to produce an intermediate of the formula:



(IV)

wherein P and R are as defined above;

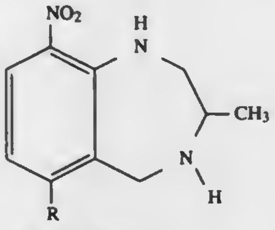
(c) deprotecting the thus obtained intermediate of Formula (IV) in an acidic medium, to produce an intermediate of the formula:



(V)

or its acid addition salt, wherein R is as defined above;

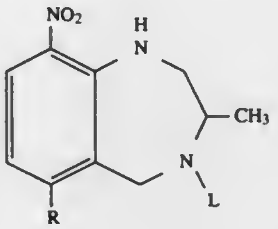
(d) cyclizing the intermediate of Formula (V) or its acid addition salt by treatment with a base in an inert reaction vehicle at an elevated temperature sufficient to effect the cyclization, to thereby produce a benzodiazepine of the formula:



(VI)

wherein R is as defined above;

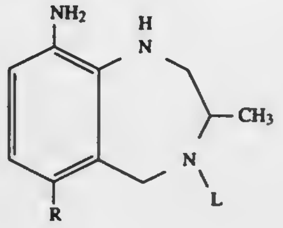
(e) N-alkylating the benzodiazepine of Formula (VI) with an alkylating reagent of formula L—W wherein L is C_{3-7}alkenyl and W is a reactive leaving group selected from the group consisting of halo and sulfonyloxy, in an inert reaction vehicle in the presence of a base at an elevated temperature sufficient to effect the N-alkylation, to produce thereby an intermediate of Formula (VIII):



(VIII)

wherein L and R are as defined above;

(f) selectively reducing the nitro group in the compound of Formula (VIII) by treatment with a reducing agent, to produce an intermediate of Formula (IX):



(IX)

wherein L and R are as defined above; and

(g) condensing the intermediate of Formula (IX) with carbon disulfide, 1,1'-carbonothionylbis or a xanthate, to produce a compound of Formula (I).

5,463,050

METHOD OF PREPARING ARYL(HOMO)PIPERAZINES

Wolter Ten Hoeve; Jantje R. G. Thiecke; Hans Wynberg, and Chris G. Kruse, all of Weesp, Netherlands, assignors to Duphar International Research, B.V., Weesp, Netherlands

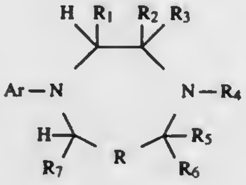
Filed Feb. 12, 1993, Ser. No. 17,497

Claims priority, application European Pat. Off., Feb. 18, 1992, 92200468

Int. Cl.⁶ C07D *295/08;243/08*

U.S. Cl. 540—575 **6 Claims**

1. Method for the preparation of a compound of the formula 2

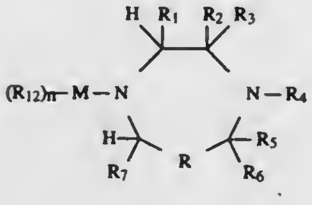


(2)

comprising reacting a compound of formula 3

$$Ar—Y \quad (3)$$

with a compound of the formula 4



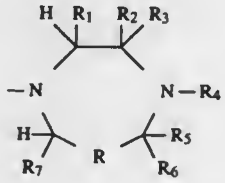
(4)

wherein

Ar means a (hetero)aryl group selected from the group consisting of phenyl, naphthyl, furyl, thienyl, pyridyl, and benzo-annelated and dibenzo-annelated heteroaryls, said heteroaryls being selected from the group consisting of furyl, thienyl and pyridyl, which (hetero)aryl group is unsubstituted or substituted with one to five non-strongly-electron-withdrawing substituents selected from the group consisting of deuterium; tritium; lower alkyl; lower alkenyl; lower alkoxy; lower alkylthio; phenylthio; hydroxyl halogen; trihalomethyl; di(lower)alkylamino, wherein the alkyl groups together with the amino-N may form a heterocyclic ring, which ring may contain a second heteroatom selected from N, O and S, and which ring may be substituted with lower alkyl; diphenylamino, unsubstituted phenyl, phenoxy and phenyl(lower)alkoxy; substituted phenyl, phenoxy and phenyl(lower)alkoxy, wherein the substituents are selected from the group consisting of halogen, lower alkyl, lower alkoxy, lower alkylthio, lower haloalkyl, hydroxy and di(lower)alkylamino; (C_1–C_2)alkylenedioxyl and SO_2R_{11};

M means a metal from group I or II of the periodic table;

R_{12} is an electronegative group selected from the group consisting of halogen, lower alkoxy, lower alkanoyloxy and a group of the formula 9



(9)

n is, dependent on the valence of M, 0 or 1;

R may be absent and represent a bond linking the two adjacent carbon atoms or means a group —CR_8R_9— or a carbonyl group;

R_1–R_3 and R_5–R_9 each mean mutually independently hydrogen, or lower alkyl or phenyl(lower)alkyl, wherein the alkyl groups may be substituted with halogen, lower alkoxy, hydroxy or protected hydroxy, and wherein the phenyl group may be substituted with halogen, lower alkyl, lower alkoxy, lower alkylthio, lower haloalkyl, hydroxy or di(lower)alkylamino;

R_4 means a hydrogen atom or a lower alkyl, aryl, aryl(lower)alkyl, lower alkylsulphonyl, arylsulphonyl, lower trialkylsilyl, triarylsilyl, lower alkylcarbonyl, arylcarbonyl, lower alkyloxycarbonyl, or aryloxycarbonyl group, wherein aryl is phenyl or naphthyl; and

Y means OR_{10} chlorine, fluorine, or SO_2R_{11}, wherein

R_{10} is lower alkyl, lower alkoxyalkyl, or phenyl or phenyl(lower)alkyl, wherein the phenyl group may be substituted with halogen, lower alkyl, lower alkoxy, lower alkylthio, lower haloalkyl, hydroxy or di(lower)alkylamino; and

R_{11} is hydroxy; OM, wherein M has the above meaning, lower alkyl; di(lower)alkylamino, wherein the alkyl groups together with the amino-N may form a heterocyclic ring, which ring may contain a second heteroatom selected from N, O and S, and which ring may be substituted with lower alkyl; diphenylamino; unsubstituted phenyl, phenoxy and phenyl(lower)alkoxy; substituted phenyl, phenoxy and phenyl, (lower)alkoxy, wherein the substituents are selected from the group consisting of halogen, lower alkyl, lower alkoxy, lower alkylthio, lower haloalkyl, hydroxy and di(lower)alkylamino; diarylamino, wherein aryl is phenyl or naphthyl; or phenyl.

5,463,051
PROCESS FOR PREPARING BENZAZEPINE INTERMEDIATES FOR THE SYNTHESIS OF D1

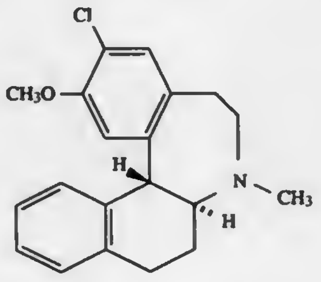
Donald Hou, Verona; Richard W. Draper, North Caldwell; Gary M. Lee, Murray Hill; Janet L. Mas, Scotch Plains, all of N.J., and Ingrid Mergelsberg, Dagmersellen, Switzerland, assignors to Schering Corporation, Kenilworth, N.J.

Filed Sep. 27, 1993, Ser. No. 127,862

Int. Cl.⁶ C07D *223/14;203/26;405/06*

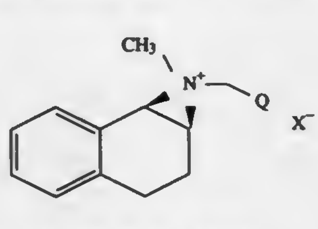
U.S. Cl. 540—576 **13 Claims**

1. A process for preparing a compound of the formula

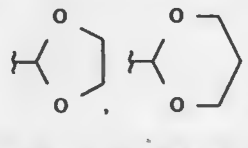


comprising:

(a) reacting an aziridinium salt of the formula

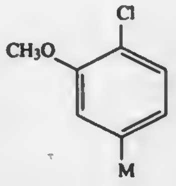


wherein: Q is a group of the formula



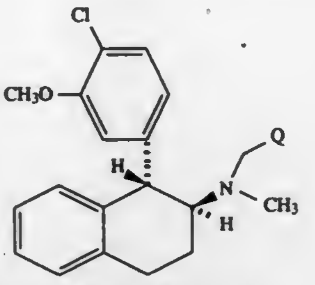
or $-CH(OR)_2$

wherein R is C_1–C_6 alkyl; and X^- is a counterion, with a reagent of the formula



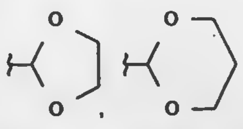
wherein M is selected from MgL, ZnL, TiL_3, CeL_2, MnL or CuL, and L is a halide selected from Br, Cl or I; to form the compound of formula (IV); and

(b) cyclizing the compound of the formula (IV)



(IV)

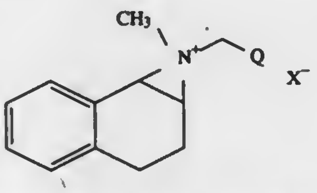
wherein: Q is a group of the formula



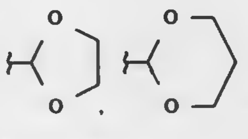
or $-CH(OR)_2$

wherein R is C_1–C_6 alkyl; by treating with a strong acid followed by treatment with a hydride reducing agent.

12. A compound of the formula



wherein: X^- is halide, BF_4^- or $R^3SO_3^-$, wherein R^3 is C_1–C_6 alkyl, CF_3, benzyl, phenyl or Z-substituted phenyl, wherein Z is C_1–C_6 alkyl, nitro or bromo; and Q is a group of the formula



or $-CH(OR)_2$

wherein R is C_1–C_6 alkyl.

5,463,052
METHOD FOR PRODUCING BENZYLIDENE DERIVATIVES

Nobuhiro Haga; Masanao Inagaki, both of Osaka; Saichi Matsumoto, Ikeda, and Susumu Kamata, Takarazuka, all of, Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

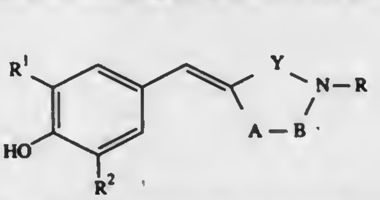
Filed May 20, 1994, Ser. No. 246,494

Claims priority, application Japan, May 26, 1993, 5-123909; Apr. 22, 1994, 6-084438

Int. Cl.⁶ C07D *275/02*

U.S. Cl. 544—2 **5 Claims**

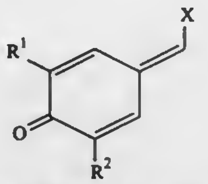
1. A method for producing compounds of the formula III:



III

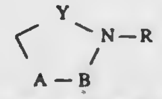
wherein R^1 and R^2 each independently is lower alkyl, lower alkoxy or halogen; Y is SO_2, SO or CO; —A— is optionally substituted lower alkylene; —B— is $—CH_2—$ or —O—; or —A— and

—B— taken together may form optionally substituted phenylene or optionally substituted lower alkenylene; and R is hydrogen, optionally substituted lower alkyl, cycloalkyl, lower alkoxy, hydroxy, optionally substituted aryl, optionally substituted arylalkyl; optionally substituted arylalkyloxy, heterocyclic ring or N-protecting group, which comprises reacting a compound of the formula I:



I

wherein R^1 and R^2 are as defined above and X is lower alkoxy with a compound of the formula II:



II

wherein Y, —A—, —B— and R are as defined above in the presence of a base.

5,463,053
OPTICALLY ACTIVE PYRIDOBENZOXAZINE DERIVATIVES

Isao Hayakawa; Shohgo Atarashi; Yoichi Kimura, and Katsuhiro Kawakami, all of Tokyo, Japan, assignors to Daiichi Pharmaceutical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 798,151, Nov. 26, 1991, abandoned. This application Jan. 21, 1994, Ser. No. 183,783

Claims priority, application Japan, Nov. 28, 1990, 2-327594

Int. Cl.^{6} C07D *215/56;* **A61K** *31/47*

U.S. Cl. 544—101 **1 Claim**

1. An optically active pyridobenzoxazine derivative or salt thereof, wherein said derivative is 10-(4-Amino-3,3-dimethyl-1-pyrrolidinyl)-9-fluoro-2,3-dihydro-3-(S)-3-methyl-7-oxo-7H-pyrido[1,2,3-de][1,4]benzoxazine-6-carboxylic acid.

5,463,054
CERTAIN ARYI FUSED PYRROLOPYRIMIDINES; A NEW CLASS OF GABA BRAIN RECEPTOR LIGANDS

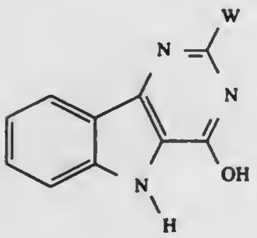
Andrew Thurkauf, Branford, and Alan Hutchison, Madison, both of Conn., assignors to Neurogen Corporation, Branford, Conn.

Continuation of Ser. No. 106,193, Aug. 12, 1993, Pat. No. 5,326,868, which is a continuation of Ser. No. 865,129, Apr. 8, 1992, abandoned. This application Jul. 1, 1994, Ser. No. 269,667

Int. Cl.^{6} C07D *487/14*

U.S. Cl. 544—250 **8 Claims**

1. A compound of the formula:



wherein:

W is

pyridyl; or

phenyl optionally mono or disubstituted with halogen, hydroxy, straight or branched chain lower alkyl having 1–6 carbon atoms, or straight or branched chain lower alkoxy having 1–6 carbon atoms.

2. A compound which is 2-(2-Fluoro-4-methoxyphenyl)-5H-indolo[3,2-d]pyrimidine.

5,463,055
PROCESS FOR THE PRODUCTION OF 2-ETHOXY-4,6-DIHYDROXYPYRIMIDINE OR ITS ALKALI SALTS

Helmut Hintermaier, Trostberg; Ursula Maier, Tacherting, and Stefan Weiss, Trostberg, all of, Germany, assignors to SKW Trostberg Aktiengesellschaft, Trostberg, Germany

Filed Dec. 22, 1993, Ser. No. 172,494

Claims priority, application Germany, Dec. 24, 1992, 42 44 132.3; Sep. 15, 1993, 43 31 223.3

Int. Cl.^{6} C07D *239/02*

U.S. Cl. 544—299 **28 Claims**

1. Process for the production of 2-ethoxy-4,6-dihydroxypyrimidine, its tautomers or its alkali salts, wherein O-ethylisourea or a salt thereof is reacted with a malonic acid dialkyl ester and an alcoholate or a salt of the malonic acid dialkyl ester in the presence of a solvent at −10° to 180° C. and, if desired, the alkali salt of the 2-ethoxy-4,6-dihydroxypyrimidine obtained is converted into the free pyrimidine derivative by acidification with a mineral acid or a carboxylic acid.

5,463,056
THIOPHENE DERIVATIVES

Friedrich Jonas, Aachen, Germany, assignor to Agfa-Gevaerf AG, Leverkusen, Germany

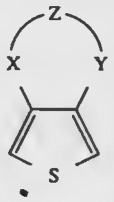
Filed May 27, 1994, Ser. No. 249,343

Claims priority, application Germany, Jun. 8, 1993, 43 19 042.1

Int. Cl.^{6} C07D *495/04*

U.S. Cl. 544—350 **2 Claims**

1. Thiophene derivatives of formula (I)



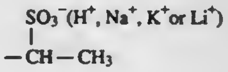
(I)

wherein

X and Y are N—R^3,

Z is a C_2-alkylene residue that may be substituted by R^1 and R^2,

R^1 and R^2 are the same or different and are hydrogen, or —$(CH_2)_n$—OR^4, —CH═CH_2 or



$$\begin{array}{l} SO_3^-(H^+, Na^+, K^+ \text{or } Li^+) \\ | \\ -CH-CH_3 \end{array}$$

n is 1 to 10,

R^3 is aryl, C_{1-18}-alkyl or H,

R^4 is $SO_3^-(H^+,Na^+,K^+ \text{or } Li^+)$ or —$(CH_2CH_2$—$O)_m$— R^5,

m is 1 to 10 and

R^5 is alkyl with 1 to 6 C atoms.

5,463,057
BI-PYRIDYL-RUMETAL COMPLEXES

Michael Graetzel, St-Sulpice, and Mohammad K. Nazeeruddin, Chavannes, both of, Switzerland, assignors to Ecole Polytechnique Federale de Lausanne, (EPFL), Switzerland

PCT No. PCT/EP93/02221, § 371 Date Apr. 20, 1994, § 102(e) Date Apr. 20, 1994, PCT Pub. No. WO94/04497, PCT Pub. Date Mar. 3, 1994

PCT Filed Aug. 19, 1993, Ser. No. 211,824

Claims priority, application United Kingdom, Aug. 21, 1992, 9217811

Int. Cl.⁶ C07D *213/22;401/04;* **C07F** *15/00*

U.S. Cl. 546—4 **6 Claims**

1. A compound of formula I

$$(X)_nRu\ LL_1 \quad (I)$$

where

n is 1 or 2

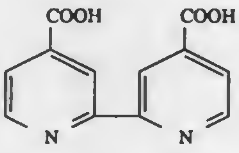
and

Ru is ruthenium;

each X independently is selected from Cl, SCN, H_2O, Br, I, CN, —NCO and SeCN;

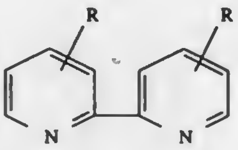
and

L is a ligand of the formula

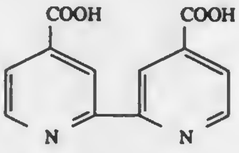


and

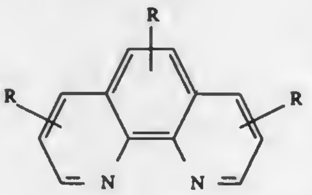
L_1 is selected from a ligand of formula a) to g)



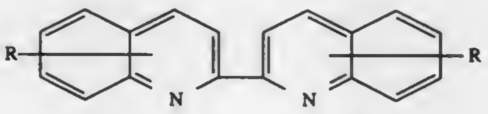
(a)



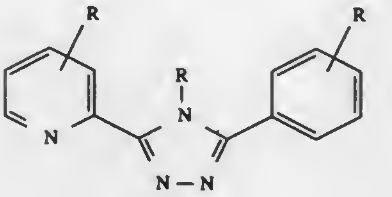
(b)



(c)



(d)



(e)

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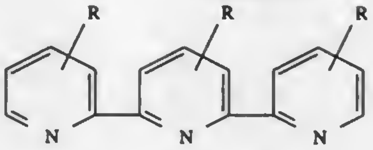
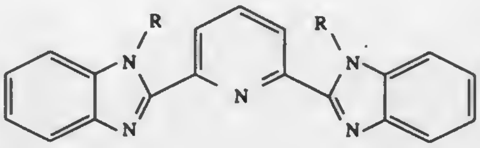


(f)



(g)

where

each R independently is selected from OH, hydrogen, C_{1-20}alkyl, —OR_a or —$N(R_a)_2$

and

each R_a independently is hydrogen or C_{1-4}alkyl.

5,463,058
SILOXANE DERIVATIVES OF 2,2,6,6-TETRAMETHYLPIPERIDINE COMPOUNDS AS STABILIZERS

Primo Carrozza, Verona, and Giovanni Da Rolt, Bologna, both of, Italy, assignors to Ciba-Geigy Corporation, Tarrytown, N.Y.

Continuation of Ser. No. 207,532, Mar. 7, 1994, abandoned. This application Feb. 21, 1995, Ser. No. 391,330

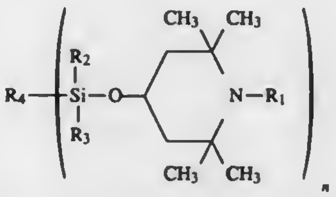
Claims priority, application Italy, Mar. 11, 1993, MI93A0469

Int. Cl.⁶ C07D *211/18;211/36;211/40;* **C07F** *7/02*

U.S. Cl. 546—14 **6 Claims**

1. A compound of formula (I)

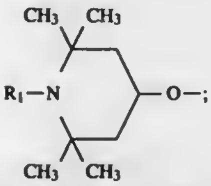
(I)



in which

R_1 is hydrogen, C_1–C_8alkyl, OH, CH_2CN, C_1–C_{18}alkoxy, C_5–C_{12}cycloalkoxy, C_3–C_6alkenyl, C_7–C_9phenylalkyl which is unsubstituted or substituted on the phenyl with 1,2 or 3 C_1–C_4alkyl, or aliphatic C_1–C_{18}acyl;

R_2 and R_3, which may be identical or different, are C_1–C_8alkyl, phenyl, C_1–C_8alkoxy or a group of formula (II)



(II)

n is 1, 2, 3 or 4; if n is 1, R_4 is C_{12}–C_{18}alkyl, C_5–C_{12} cycloalkyl which is unsubstituted or substituted with 1, 2 or 3 C_1–C_4alkyl or one of the groups of formulae (IIIa)–(IIId)

$$R_5—O—R_6— \quad (IIIa)$$

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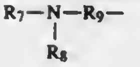
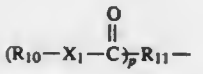


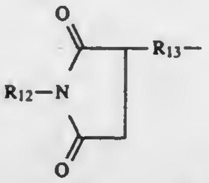
$R_7-\underset{R_8}{\underset{|}{N}}-R_9-$

(IIIb)



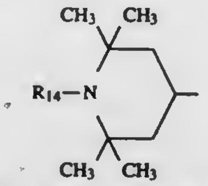
$(R_{10}-X_1-\overset{O}{\overset{\|}{C}})_{\overline{p}}R_{11}-$

(IIIc)



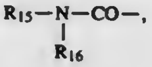
(IIId)

in which R_5 is C_1–C_{18}alkyl, C_3–C_{30}alkyl interrupted by one or more oxygen atoms, C_5–C_{12}cycloalkyl which is unsubstituted or substituted with 1,2 or 3 C_1–C_4alkyl, phenyl which is unsubstituted or substituted with 1,2 or 3 C_1–C_4alkyl or with C_1–C_4alkoxy, C_7–C_9phenylalkyl which is unsubstituted or substituted on the phenyl with 1,2 or 3 C_1–C_4alkyl, a group of formula (IV)



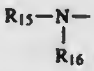
(IV)

where R_{14} has any one of the meanings given for R_1, or R_5 is aliphatic, cycloaliphatic or aromatic acyl containing not more than 22 carbon atoms or a group



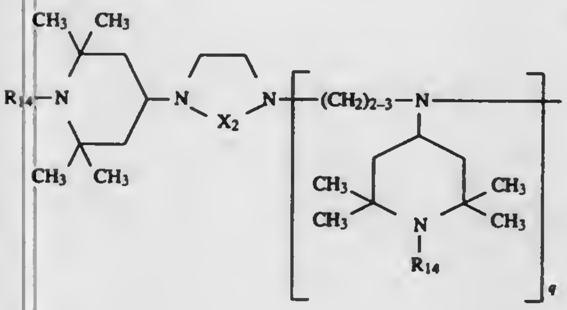
$R_{15}-\underset{R_{16}}{\underset{|}{N}}-CO-,$

where R_{15} and R_{16}, which may be identical or different, are hydrogen, C_1–C_{18}alkyl, C_5–C_{12}cycloalkyl which is unsubstituted or substituted with 1,2 or 3 C_1–C_4alkyl, C_7–C_9phenylalkyl which is unsubstituted or substituted on the phenyl with 1,2 or 3 C_1–C_4alkyl or a group of formula (IV), or



$R_{15}-\underset{R_{16}}{\underset{|}{N}}-$

is a heterocyclic group with 5–7 members, or one of the groups of formulae (Va)–(Vc)



(Va)

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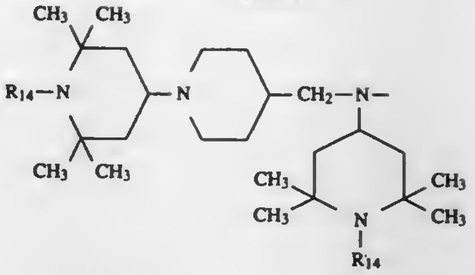
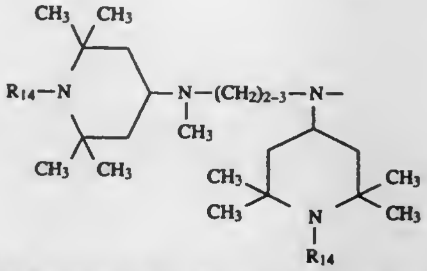
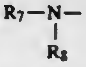


(Vb)



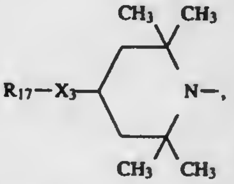
(Vc)

in which R_{14} is as defined above, X_2 is —CH_2CH_2—, —CO—, —COCO— or —$COCH_2CO$— and q is zero or 1; R_6 is C_2–C_{18}alkylene; R_7 and R_8, which may be identical or different, are as defined above for R_{15} and R_{16}, or R_7 is also (C_1–C_{18}alkoxy)carbonyl or aliphatic, cycloaliphatic or aromatic acyl containing not more than 22 carbon atoms, or

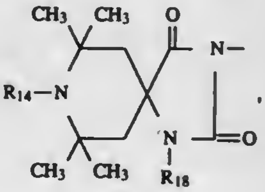


$R_7-\underset{R_8}{\underset{|}{N}}-$

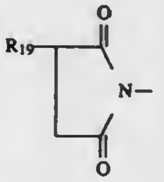
is a heterocyclic group having 5–7 members or one of the groups of formulae (Va)–(Vc) or one of the groups of formulae (VIa)–(VIc)



(VIa)

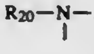


(VIb)



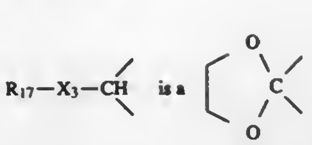
(VIc)

in which X_3 is —O— or

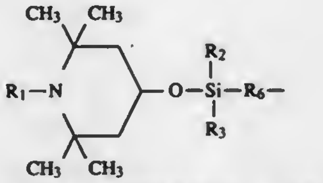


$R_{20}-\underset{|}{N}-,$

where R_{20} is as defined above for R_{15} and R_{16}; R_{17} is as defined above for R_7 or R_{17}—X_3— is hydrogen or a nitrogen-containing heterocyclic group having 5–7 members, with the free valency on the nitrogen atom, or the group

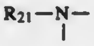


group, R_{14} is as defined above, R_{18} is hydrogen, methyl, acetyl or benzyl and R_{19} is hydrogen or C_1–C_{30}alkyl; R_9 is C_3–C_{18}alkylene; R_{10} is C_1–C_{18}alkyl, C_5–C_{12}cycloalkyl which is unsubstituted or substituted with 1,2 or 3 C_1–C_4alkyl, C_7–C_9phenylalkyl which is unsubstituted or substituted on the phenyl with 1,2 or 3 C_1–C_4alkyl or a group of formula (IV), or R_{10} is a group of formula (VII)



(VII)

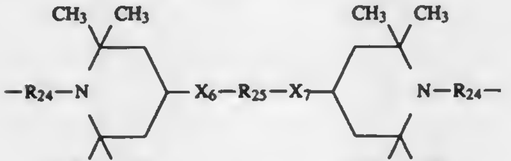
with R_1, R_2, R_3 and R_6 as defined above; X_1 is as defined above for X_3 or $R_{10}X_1$— is a nitrogen-containing heterocyclic group having 5–7 members, with the free valency on the nitrogen atom, or one of the groups of formulae (Va)–(Vc) or (VIa)–(VIc); p is 1,2 or 3 and, if p is 1, R_{11} is C_2–C_{18}alkylene, if p is 2, R_{11} is C_2–C_{20}alkanetriyl, C_5–C_7cycloalkanetriyl or C_7–C_9bicycloalkanetriyl and, if p is 3, R_{11} is C_3–C_6alkanetetrayl; R_{12} is as defined above for R_{15} and R_{16} and R_{13} is a direct bond or C_1–C_{30}alkylene; if n is 2, R_4 is C_2–C_{12}alkylene, C_4–C_{22}alkylene interrupted by an oxygen atom or by an



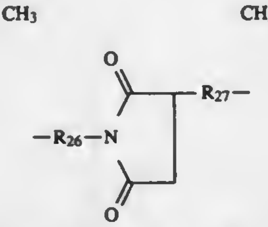
$R_{21}-\underset{|}{N}-$

group, where R_{21} is as defined above for R_7, or R_4 is one of the groups of formulae (VIIIa)–(VIIIc)

$$-R_{22}-X_4-R_{23}-X_5-R_{22}- \quad \text{(VIIIa)}$$

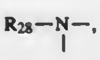


(VIIIb)



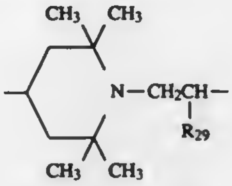
(VIIIc)

in which X_4 and X_5, which may be identical or different, are —O— or

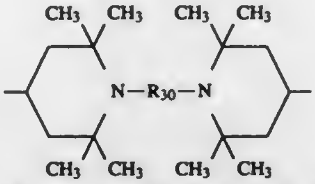


$R_{28}-\underset{|}{N}-,$

where R_{28} is as defined above for R_7; R_{22} is C_2–C_{18}alkylene or a —$C_rH_{2r}CO$— group, where r is an integer from 2 to 18 and the carbonyl group is bonded to X_4 or X_5; R_{23} is C_2–C_{12}alkylene, C_4–C_{12}alkylene interrupted by one or more oxygen atoms, C_5–C_7cycloalkylene, C_5–C_7cycloalkylenedi(C_1–C_4alkylene), C_1–C_4alkylenedi(C_5–C_7cycloalkylene), isopropylidenedicyclohexylene, phenylene which is unsubstituted or substituted by 1 or 2 C_1–C_4alkyl, phenylenedi(C_1–C_4alkylene), C_2–C_4alkylidenediphenylene or a group of formula (IXa) or (IXb)

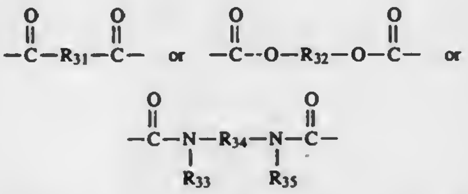


(IXa)

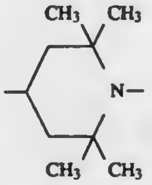


(IXb)

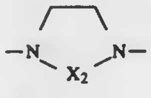
in which R_{29} is hydrogen or C_1–C_4alkyl and R_{30} is C_2–C_{12}alkylene, C_4–C_{12}alkylene interrupted by one or more oxygen atoms or phenylenedi(C_1–C_4alkylene) or, if R_{22} is C_2–C_{18}alkylene, R_{23} is also carbonyl, a



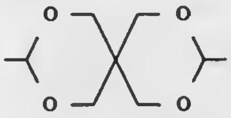
group, where R_{31} is a direct bond, C_1–C_{12}alkylene, C_2–C_{20}alkylidene, C_5–C_7cycloalkylene or phenylene which is unsubstituted or substituted with 1 or 2 C_1–C_4alkyl, R_{32} and R_{34} are C_2–C_{12}alkylene, C_4–C_{12}alkylene interrupted by one or more oxygen atoms, C_5–C_7cycloalkylene, C_5–C_7cycloalkylenedi(C_1–C_4alkylene), C_1–C_4alkylenedi(C_5–C_7cycloalkylene), C_2–C_4alkylenedi(C_5–C_7cycloalkylene) or a group of formula (IXa) or (IXb), and R_{33} and R_{35}, which may be identical or different, are as defined above for R_{15} and R_{16}, or the —R_{23}—X_5— group is a



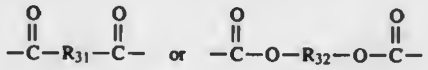
group or the —X_4—R_{23}—X_5— group is a



group with X_2 as defined above or a

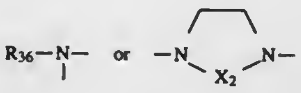


group; R_{24} is C_3–C_{18}alkylene; X_6 and X_7, which may be identical or different, are as defined above for X_4 and X_5; R_{25} is C_2–C_{12}alkylene, C_4–C_{12}alkylene interrupted by one or more oxygen atoms, C_5–C_7cycloalkylene, C_5–C_7cycloalkylenedi(C_1–C_4alkylene), C_1–C_4alkylenedi(C_5–C_7cycloalkylene), carbonyl, or

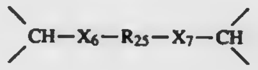


$$-\overset{O}{\overset{\|}{C}}-R_{31}-\overset{O}{\overset{\|}{C}}- \quad \text{or} \quad -\overset{O}{\overset{\|}{C}}-O-R_{32}-O-\overset{O}{\overset{\|}{C}}-$$

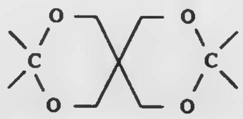
group, with R_{31} and R_{32} as defined above, or the $-X_6-R_{25}-X_7-$ group is an



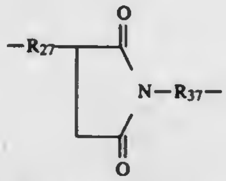
group, where R_{36} is as defined above for R_7 and X_2 is as defined above, or the



group is a



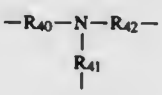
group; R_{26} is C_3–C_{18}alkylene or a group of formula (X)



(X)

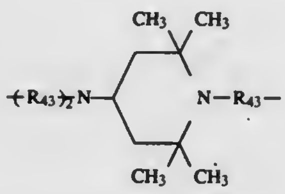
where R_{37} is C_2–C_{12}alkylene, C_4–C_{12}alkylene interrupted by one or more oxygen atoms, C_5–C_7cycloalkylene, C_5–C_7cycloalkylenedi(C_1–C_4alkylene) or C_1–C_4alkylenedi(C_5–C_7cycloalkylene) and R_{27} is a direct bond or C_1–C_{30}alkylene; if n is 3, R_4 is one of the groups of formulae (XIa)–(XIe)

$$R_{38}\left(O-R_{39}\right)_3 \qquad \text{(XIa)}$$



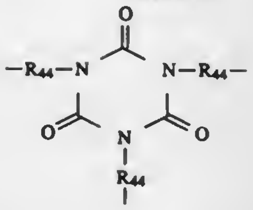
(XIb)

$$-R_{40}-\underset{\underset{|}{R_{41}}}{\underset{|}{N}}-R_{42}-$$

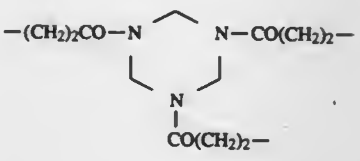


(XIc)

-continued

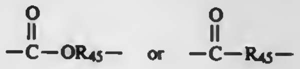


(XId)



(XIe)

which R_{38} is C_3–C_{12}alkanetriyl or aliphatic or aromatic triacyl containing not more than 12 carbon atoms; R_{39} is C_2–C_{18}alkylene or, if R_{38} is C_3–C_{12}alkanetriyl, R_{39} is also a $-C_sH_{2s}CO-$ group where s is an integer from 2 to 18 and the carbonyl group is bonded to the oxygen atom; R_{40}, R_{41} and R_{42}, which may be identical or different, are C_3–C_{18}alkylene or R_{40} is also a

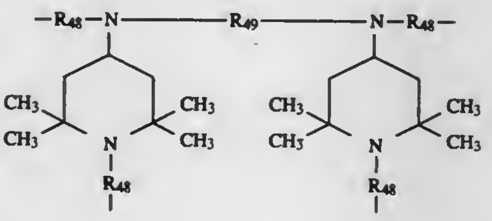


$$-\overset{O}{\overset{\|}{C}}-OR_{45}- \quad \text{or} \quad -\overset{O}{\overset{\|}{C}}-R_{45}-$$

group, where the carbonyl group is bonded to the nitrogen atom and R_{45} is C_2–C_{18}alkylene; R_{43} is C_3–C_{18}alkylene and R_{44} is C_2–C_6alkylene; if n is 4, R_4 is one of the groups of formulae (XIIa)–(XIIc)

$$R_{46}\left(OR_{47}\right)_4 \qquad \text{(XIIa)}$$

$$\left(R_{48}\right)_2 N-R_{49}-N\left(R_{48}\right)_2 \qquad \text{(XIIb)}$$



(XIIc)

in which R_{46} is C_4–C_6alkanetetrayl or aliphatic or aromatic tetraacyl containing not more than 12 carbon atoms; R_{47} is C_2–C_{18}alkylene or, if R_{46} is C_4–C_1–C_{12}alkanetetrayl, R_{47} is also a $-C_sH_{2s}CO-$ group as defined above; R_{48} is C_3–C_{18}alkylene and R_{49} is as defined above for R_{25}.

5,463,059
PROCESS FOR THE PREPARATION OF INTERMEDIATES USEFUL IN THE PREPARATION OF PYRANYL CYANOGUANIDINE DERIVATIVES

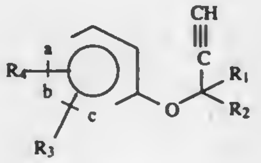
Jollie D. Godfrey, Jr., Trenton; Richard H. Mueller, Ringoes; Thomas C. Sedergran, Englishtown, and Nachimuthu Soundararajan, Kendall Park, all of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 975,498, Nov. 10, 1992, abandoned. This application Oct. 1, 1993, Ser. No. 128,436

Int. Cl.^{6} C07F ***9/06***

U.S. Cl. 546—21 **16 Claims**

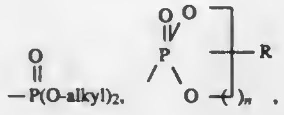
1. A process for the preparation of compounds of the formula



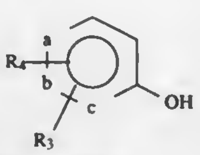
I

where

- a, b, and c are all carbon atoms or one of a, b and c is a nitrogen atom or —NO— and the others are carbon atoms;
- R_1 and R_2 are each independently hydrogen, alkyl or arylalkyl, or, R_1 and R_2 taken together with the carbon atom to which they are attached form a 5- to 7-membered carbocyclic ring;
- R_3 is hydrogen, alkyl, haloalkyl, alkenyl, alkynyl, cycloalkyl, arylalkyl, cycloalkylalkyl, —CN, —NO_2, —COR, —COOR, —CONHR, —CONRR', —CF_3, S—alkyl, —SOalkyl, —SO_2alkyl,

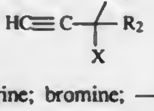


halogen, amino, substituted amino, —OH, —O—alkyl, —OCF_3, —OCH_2CF_3, —OCOalkyl, —OCONRalkyl, —NRCOalkyl, —NRCOOalkyl or —NRCONRR', wherein R and R' are independently hydrogen, alkyl, haloalkyl, aryl, arylalkyl, cycloalkyl, or (cycloalkyl)alkyl;
- R_4 is hydrogen, alkyl, —OH, —O—alkyl, amino, substituted amino, —NHCOR, —CN, or —NO_2; and
- n is an integer of 1 to 3; comprising the step of alkylating a phenol of formula



II

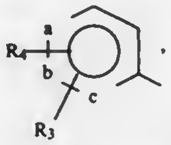
with an acetylene of formula



III

$$HC{\equiv}C-\overset{R_1}{\underset{X}{C}}-R_2$$

where X is chlorine; bromine; —OC(O)—R_5, where R_5 is alkyl, aryl or substituted aryl; or —OCO_2R_6, where R_6 is alkyl or



in the presence of a catalytic amount of a cuprous salt.

5,463,060
ONE-POT PROCESS

Jerry W. Misner, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed May 21, 1992, Ser. No. 886,800

Int. Cl.^{6} C07D ***457/02***

U.S. Cl. 546—68 **20 Claims**

1. A one-pot process for preparing pergolide comprising reacting 8,9-dihydroelymoclavine with 1-iodopropane at elevated temperature in the presence of a calcium, magnesium or alkali metal bicarbonate or carbonate and a solvent chosen from N-methylpyrrolidinone, hexamethylphosphoramide, dimethylpropyleneurea and dimethylethyleneurea until the 8,9-dihydroelymoclavine is substantially consumed to prepare a first intermediate mixture; diluting the first intermediate mixture with a large volume of a basic solvent chosen from pyridine, picoline and lutidine, chilling the diluted mixture to a low temperature, combining it with a toluene- or C_1–C_3 alkanesulfonyl halide, and allowing reaction to continue at low temperature until the first intermediate is substantially consumed to prepare a second intermediate mixture; combining the cold second intermediate mixture with a cold solution of alkali metal thiomethoxide, and allowing reaction to continue at elevated temperature until the second intermediate is substantially consumed to prepare a crude pergolide mixture; diluting the crude pergolide mixture with water to obtain solid pergolide, and washing the pergolide with water to obtain pergolide of at least 90% purity.

5,463,061
PROCESS FOR PRODUCTION OF GLYCIDE DERIVATIVE

Nobuyuki Fukazawa; Tsuneji Suzuki; Nobuya Kawauchi; Hironori Komatsu; Kengo Otsuka, and Yuki Nakajima, all of Mobara, Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

PCT No. PCT/JP93/00626, § 371 Date Jan. 13, 1994, § 102(e) Date Jan. 13, 1994, PCT Pub. No. WO93/23386, PCT Pub. Date Nov. 25, 1993

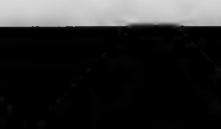
PCT Filed May 13, 1993, Ser. No. 175,397

Claims priority, application Japan, May 15, 1992, 4-123338

Int. Cl.^{6} C07D ***215/20***

U.S. Cl. 546—158 **15 Claims**

1. A process for producing a glycide derivative represented by the following general formula (I), which is characterized by reacting a hydroxyaryl or heteroaryl represented by A-OH with glycidyl tosylate in a solvent in the presence of a cesium base selected from the group consisting of cesium carbonate and cesium hydroxide:



(I)

wherein A represent an aryl group or a heteroaryl group.

5,463,062

SUBSTITUTED CYCLOHEXANE DERIVATIVES, PROCESSES FOR THEIR PREPARATION AND THE USE OF THE COMPOUNDS FOR TREATING DISEASES

Horst Hemmerle, Lorsch; Peter Schindler, Bad Soden, and Andreas Herling, Bad Camberg, all of, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

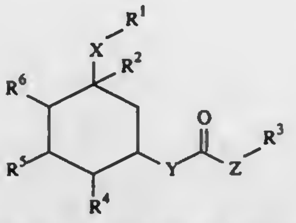
Filed Sep. 7, 1993, Ser. No. 116,563

Claims priority, application Germany, Sep. 9, 1992, 42 30 067.3

Int. Cl.^{6} C07D *25/04;401/08;403/08;* **A61K** *31/47;31/415;31/41*

U.S. Cl. 546—168 **11 Claims**

1. A cyclohexane derivative of the formula I



I

in which the radicals have the following meanings:

R^1 is CN, COOH, C_1–C_4-alkanoyl, SO_3-C_1–C_4-alkyl, SO_3H or $SO_2NR^8R^9$;

$R^2$is C_1–C_{10}-alkyl$(R^{11})_n$, O—C_1–C_{10}-alkyl$(R^{11})_n$, C_2–C_{10}-alkenyl$(R^{11})_n$, O—C_3–C_{10}-alkenyl$(R^{11})_n$, C_2–C_{10}-alkynyl$(R^{11})_n$, O—C_3–C_{10}-alkynyl$(R^{11})_n$, S—C_1–C_{10}-alkyl$(R^{11})_n$, S—C_3–C_{10}-alkenyl$(R^{11})_n$, S—C_3–C_{10}-alkynyl$(R^{11})_n$, NH—C_1–C_{10}-alkyl$(R^{11})_n$, NH—C_3–C_{10}-alkenyl$(R^{11})_n$ or NH—C_3–C_{10}-alkynyl$(R^{11})_n$, where R^{11} is unsubstituted or substituted in each case by $R^{12:}$

R^3 is indolyl, imidazolyl, benzimidazolyl, quinolyl or tetrazolyl, the heteroaromatic system being unsubstituted or substituted one to three times, identically or differently, by F, Cl, Br, I, OH, CF_3, —NO_2, CN, C_1–C_4-alkoxy, C_1–C_4-alkyl, NR^8R^9, phenyl benzyl thienyl furyl, O-penyl or O-benzyl;

R^{11} and R^{13} are identical or different and are alkyl with 1 to 10 carbon atoms, cycloalkyl with 3–8 ring carbon atoms, phenyl, naphthyl, phenanthryl, thienyl, furyl or coumarinyl, the aromatic or heteroaromatic system being unsubstituted or substituted one to three times, identically or differently, by F, Cl, Br, I, OH, CF_3, —NO_2, CN, C_1–C_4-alkoxy, C_1–C_4-alkyl, NR^8R^9, phenyl, benzyl, thienyl, furyl, O-phenyl or O-benzyl;

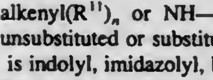
R^4, R^5 and R^6 are identical or different and are H, OH, a protected OH group, F, Cl or Br;

R^7 is C_1–C_4-alkyl, phenyl or benzyl;

R^8 and R^9 are identical or different and are H, C_1–C_4-alkyl, C_1–C_4-alkanoyl, phenyl which is unsubstituted or substituted by F, Cl, Br, I, OH, O—C_1–C_4-alkyl, CF_3, —NO_2 or CN;

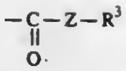
R^{12} is phenyl, naphthyl, phenanthryl, thienyl, furyl or coumarinyl, the aromatic or heteroaromatic system being unsubstituted or substituted one to three times, identically or differently, by F, Cl, Br, I, OH, CF_3, —NO_2, CN, C_1–C_4-alkoxy, C_1–C_4-alkyl, C_2–C_4-alkenyl, NR^8R^9, phenyl, benzyl, thienyl, furyl, O-phenyl or O-benzyl;

X is $(CH_2)_m$, —CH=CH—, —C=C—, —CH_2—O—CH_2-, —CH_2—S—CH_2— or



$$-CH_2-\underset{\displaystyle R^8}{\underset{|}{N}}-CH_2-;$$

Y is $(CH_2)_m$, O, S or NR^8; Z is $(CH_2)_m$, S, O, S—C_1–C_{10}-alkyl, O—C_1–C_{10}-alkyl, CH=CH, CH=CF, CH=CCl, CH=CBr, CH_2—CO, CH_2—CHF, CH_2—CHCl, CH_2—CHBr, CH_2—CHI, C_3–C_{10}-cycloalkylene, C_3–C_{10}-cycloalkenylene, $COOR^7$, C≡C, CH=C(C_1–C_4-alkyl), CH=C(CN), CH=C(NR^8R^9), CH=C(C_1–C_4-alkanoyl), CH=C(R^{13}), NR^8, or C_3–C_{10}-cycloalkylene or C_3–C_{10}-cycloalkenylene in which 1 to 3 ring carbon atoms are replaced by sulfur or oxygen atoms, and when Y is oxygen,



$$-\underset{\displaystyle O}{\underset{\|}{C}}-Z-R^3$$

can together be an amino-acid residue selected from the group consisting of Ala, Arg, Asn, Asp, Cys, Gln, Glu, Gly, Ile, Leu, Lys, Phe, Pro, Ser, Thr, Tyr and their derivatives protected by conventional protective groups;

n is zero, 1 or 2;

m is zero, 1, 2, 3 or 4;

or a physiologically tolerated salt of the cyclohexane derivative of the formula I, with the exception of the compound in which R^1 is COOH; R^2 is O—C_1-alkyl$(R^{11})_n$ with n being 0; R^3 is phenyl substituted in the 4-position with OH; R^4 and R^5 are both OH; R^6 is hydrogen; X is$(CH_2)_m$ with m being 0; Y is oxygen; and Z is CH=CH.

5,463,063

RING CLOSURE OF N-PHTHALOYLGLUTAMINES

George W. Muller, Bridgewater, N.J., assignor to Celgene Corporation, Warren, N.J.

Continuation-in-part of Ser. No. 87,510, Jul. 2, 1993, abandoned. This application Oct. 20, 1993, Ser. No. 140,237

Int. Cl.^{6} C07D *401/04*

U.S. Cl. 546—201 **1 Claim**

1. In the process of preparing thalidomide in which N-phthaloylisoglutamine or N-phthaloylglutamine is cyclized with N-N'-carbonyldiimidazole, the improvement which comprises cyclizing said N-phthaloylisoglutamine or N-phthaloylglutamine by refluxing a mixture of N-phthaloylisoglutamine or N-phthaloylglutamine, N-N'-carbonyldiimidazole and anhydrous tetrahydrofuran.

5,463,064

DIHYDROPYRIDINE-3,5-DICARBOXYLIC ACID ESTER DERIVATIVES

Kazuharu Tamazawa; Tadao Kojima, both of Saitama; Hideki Arima, Tokyo; Yukiyasu Murakami, Saitama; Yasuo Isomura; Minoru Okada, both of Tokyo; Kiyoshi Takanobu, Saitama, and Toichi Takenaka, Tokyo, all of, Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

Division of Ser. No. 826,232, Jan. 23, 1992, Pat. No. 5,364,872, which is a continuation of Ser. No. 600,130, Oct. 17, 1990, abandoned, which is a continuation of Ser. No. 478,724, Feb. 9, 1990, abandoned, which is a continuation of Ser. No. 296,919, Jan. 11, 1989, abandoned, which is a continuation of Ser. No. 945,168, Dec. 22, 1986, abandoned, which is a continuation of Ser. No. 723,043, Apr. 15, 1985, abandoned. This application May 5, 1994, Ser. No. 238,537

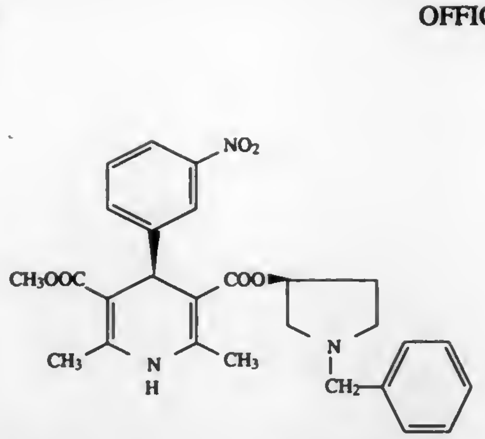
Claims priority, application Japan, Apr. 15, 1984, 59-75998; Jun. 4, 1984, 59-114098; Aug. 7, 1984, 59-165793

The portion of the term of this patent subsequent to Nov. 15, 2011, has been disclaimed.

Int. Cl.^{6} C07D *401/12*

U.S. Cl. 546—281 **3 Claims**

1. A dextro-rotatory optical isomer of diastereoisomer A of (±)-2,6-dimethyl-4-(3-nitrophenyl)- 1,4-dihydropyridine-3,5-dicarboxylic acid 3-(1-benzylpyrrolidin-3-yl)ester5-methyl ester having the formula



and wherein the melting point of the hydrochloride of said dextrorotatory optical isomer is 223° to 230° C. (decomp.), or a pharmaceutically acceptable acid addition salt thereof.

5,463,065
PROCESS FOR THE PREPARATION OF 2-AMINO-5-METHYL-PYRIDINE

Eric Rivadeneira, Leverkusen, and Klaus Jelich, Wuppertal, both of, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

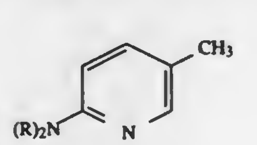
Division of Ser. No. 43,648, Apr. 6, 1993, Pat. No. 5,332,824. This application Apr. 18, 1994, Ser. No. 229,078

Claims priority, application Germany, Apr. 15, 1992, 42 12 596.0; Sep. 25, 1992, 42 32 175.1

Int. Cl.^{6} C07D *213/72*

U.S. Cl. 546—304 **3 Claims**

1. A 2-dialkylamino-5-methyl-pyridine of the formula



in which

R is C_1–C_4-alkyl.

5,463,066
PHOSPHOLIPID DERIVATIVE AND REACTIVE VESICLE-FORMING AGENT

Tsuyoshi Miyazaki, Tsukuba; Kouzoh Sanchika, Kawasaki; Mitsuhiro Nishida, Amagasaki; Tohru Yasukohchi, Kawasaki; Shigeru Kitano, Tsukuba; Akinori Suginaka, Chigasaki, and Yoshihito Kadoma, Kobe, all of, Japan, assignors to NOF Corporation, Tokyo, Japan

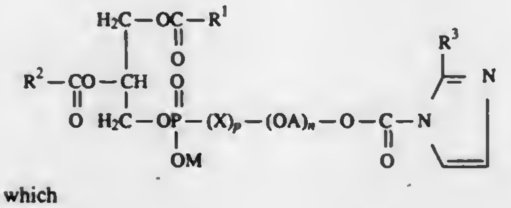
Filed Dec. 5, 1994, Ser. No. 349,368

Claims priority, application Japan, Dec. 6, 1993, 5-305611; Dec. 6, 1993, 5-305612; Dec. 16, 1993, 5-317026; Dec. 16, 1993, 5-317027

Int. Cl.^{6} C07D *233/64*

U.S. Cl. 548—112 **4 Claims**

1. A phospholipid derivative represented by the general formula (1):



(1)

in which

$R^1C(=O)$ and $R^2C(=O)$ represent each an aliphatic acyl group having 3–30 carbon atoms and may be identical or different from each other,

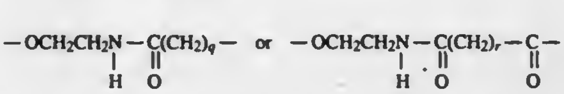
R^3 denotes hydrogen atom or methyl group,

OA represents an oxyalkylene group of 2–4 carbon atoms,

n indicates the average addition mole number of added oxyalkylene group and is a positive number of 1–1,000, with the proviso that the oxyalkylene groups may be identical or different from each other and may be added randomly or in a block when n is 2 or higher,

p is 0 or 1,

X represents the group



$$-OCH_2CH_2\underset{H}{N}-\underset{O}{\overset{\|}{C}}(CH_2)_q- \quad \text{or} \quad -OCH_2CH_2\underset{H}{N}-\underset{O}{\overset{\|}{C}}(CH_2)_r-\underset{O}{\overset{\|}{C}}-$$

wherein q is an integer of 0 to 4 and r is an integer of 1 to 4 and

M denotes hydrogen atom or an alkali metal atom.

5,463,067
PROCESS FOR MAKING HIV PROTEASE INHIBITORS

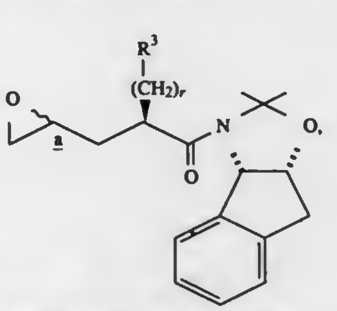
David Askin, Warren; Kan K. Eng, Jersey City, and Ralph P. Volante, Cranbury, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 93,225, Jul. 16, 1993, abandoned. This application Jan. 26, 1994, Ser. No. 187,664

Int. Cl.^{6} C07F *9/02;* **C07D** *407/02*

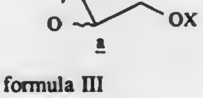
U.S. Cl. 548—113 **11 Claims**

1. A process for making a compound of formula IV



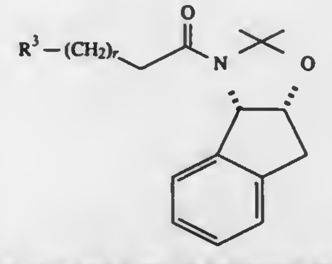
IV

comprising reacting a compound of formula II



II

with an amide of formula III



III

in the presence of a strong base at low temperature, wherein:

stereocenter a is in either the R configuration, the S configuration or is racemic;

X is selected from the group consisting of —H, methanesulfonyl, trifluoromethanesulfonyl, p-toluenesulfonyl, benzenesulfonyl, and 3-nitrobenzenesulfonyl;

r is an integer from zero through and including 5;

R^3 is selected from the group consisting of:

1) hydrogen,

2) —C_{1-4} alkyl

3) C_5–C_{10} cycloalkyl, optionally substituted with hydroxy,

4) C_6–C_{10} aryl, unsubstituted or substituted with one or more of:
   - a) halo,
   - b) hydroxy,
   - c) —NO_2 or —$N(R)_2$,
   - d) C_{1-4} alkyl,
   - e) C_{1-3} alkoxy, unsubstituted or substituted with one or more of —OH or C_{1-3} alkoxy,
   - f) —COOR,
   - g) —$CON(R)_2$,
   - h) —$CH_2N(R)_2$,
   - i) —CH_2NHCOR,
   - j) —CN,
   - k) —CF_3,
   - l) —NHCOR,
   - m) aryl C_{1-3} alkoxy,
   - n) aryl,
   - o) —$NRSO_2R$,
   - p) —$OP(O)(OR_x)_2$, or
   - q) —R^5, as defined below, or

5) monocyclic or bicyclic heterocycle containing from 1 to 3 heteroatoms chosen from the group consisting of N, O, and S, and which is unsubstituted or substituted with R^5 and optionally with one or more of
   - a) halo,
   - b) C_{1-4} alkyl, or
   - c) C_{1-3} alkoxy;

R is hydrogen or C_{1-4} alkyl;

R_x is H or aryl; and

R^5 is

1) —W—$(CH_2)_m$—NR^6R^7 wherein W is —O— or —S—, m is 2, 3, 4 or 5, and R^6 and R^7 are independently selected at each occurrence from:
   - a) hydrogen,
   - b) C_{1-6} alkyl, unsubstituted or substituted with one or more of
     - i) C_{1-3} alkoxy,
     - ii) —OH, or
     - iii) —$N(R)_2$,
   - c) aromatic heterocycle unsubstituted or substituted with one or more of
     - i) C_{1-4} alkyl, or
     - ii) —$N(R)_2$,
   - d) or R^6 and R^7 are joined together with the nitrogen to which they are attached to form a 5–7 member heterocycle containing up to two additional heteroatoms selected from —N(R), —O—, —S—, —S(O)— or —$S(O)_2$—, the heterocycle optionally substituted with C_{1-4} alkyl,

2) —$(CH_2)_q$—NR^6R^7 wherein q is an integer from 1–5, and R^6 and R^7 are defined above, except that R^6 or R^7 are not H or unsubstituted C_{1-6} alkyl, or

3) benzofuryl, indolyl, azacycloalkyl, azabicyclo C_{7-11} cycloalkyl, or benzopiperidinyl, unsubstituted or substituted with C_{1-4} alkyl.

5,463,068

PROCESS FOR DESULPHURIZING ORGANIC MERCAPTO AND/OR DISULPHIDE COMPOUNDS

Ferdinand Hagedorn; Helmut Fiege, and Hans-Joachim Traenckner, all of Leverkusen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Jun. 7, 1994, Ser. No. 255,024

Claims priority, application Germany, Jun. 14, 1993, 43 19 574.1

Int. Cl.^{6} C07D *277/82;235/04*

U.S. Cl. 548—152 **9 Claims**

1. A process for preparing organic compounds of reduced sulphur content and sulphur-free organic compounds from organic mercapto compounds, disulphide compounds or both in yields of more than 90% of theory by hydrogenolytic elimination of hydrogen sulphide, comprising carrying out the elimination of hydrogen sulphide in the presence of an organic solvent by means of an aqueous, non-oxidizing, strong acid selected from the group consisting of aqueous hydrochloric acid and aqueous sulphuric acid, and elemental iron, aluminium, or zinc or mixtures thereof in the presence of catalytic amounts of nickel, cobalt a mixture thereof.

5,463,069

PROCESS OF PRODUCING 2-IMINOTHIAZOLINE DERIVATIVES AND PROCESS OF PRODUCING THEIR INTERMEDIATES

Katuhisa Masumoto, Ibaraki; Toshio Nagatomi, Takarazuka; Akihiko Nakamura, Nishinomiya, and Yoshimi Yamada, Osaka, all of, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

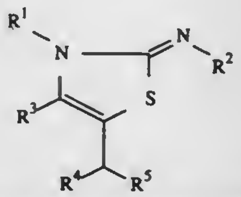
Filed Dec. 2, 1993, Ser. No. 160,261

Claims priority, application Japan, Dec. 4, 1992, 4-325259; Feb. 5, 1993, 5-018609

Int. Cl.^{6} C07D *277/42;277/46*

U.S. Cl. 548—190 **9 Claims**

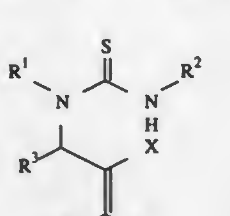
1. A process of producing a 2-iminothiazoline derivative of the general formula:



[II]

wherein R^1 is selected from the group consisting of an optionally substituted alkyl group, an optionally substituted cycloalkyl group, an optionally substituted aryl group, and an optionally substituted heteroaryl group; R^2 is selected from the group consisting of hydrogen, an optionally substituted alkyl group, an optionally substituted cycloalkyl group, an optionally substituted aryl group, an optionally substituted alkylcarbonyl group, an optionally substituted cycloalkylcarbonyl group, an optionally substituted arylcarbonyl group, an optionally substituted alkoxycarbonyl group, an optionally substituted cycloalkyloxycarbonyl group, and an optionally substituted aryloxycarbonyl group; and R^3, R^4 and R^5 are the same or different, each of which is selected from the group consisting of hydrogen, an optionally substituted alkyl group, and an optionally substituted aryl group, the process comprising the step of:

treating a thiourea derivative of the general formula:



wherein R^1, R^2, R^3, R^4 and R^5 are each as defined above and X is halogen, with a protonic acid having strong acidity or a metal salt having Lewis acidity and a protonic acid.

5,463,070

HYPOGLYCEMIC HYDROXYUREA DERIVATIVES

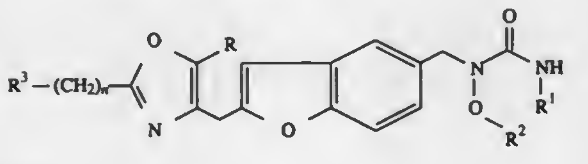
Steven W. Goldstein, Mystic, and Ruth E. McDermott, Salem, both of Conn., assignors to Pfizer Inc., New York, N.Y.

Continuation of Ser. No. 279,322, Jul. 22, 1994, abandoned, which is a division of Ser. No. 983,538, Feb. 22, 1993, Pat. No. 5,334,604, which is a continuation of Ser. No. 572,745, Aug. 23, 1990, abandoned. This application Feb. 17, 1995, Ser. No. 391,308

Int. Cl.^{6} C07D *413/06*

U.S. Cl. 548—236 **5 Claims**

1. A compound of the formula



wherein

R is hydrogen or C1 to C3 alkyl;

R^1 and R^2 are taken separately, wherein R^1 is hydrogen or R^4 and R^2 is —COR^5 or —$COOR^5$;

R^3, R^4 and R^5 are each independently C1 to C9 alkyl, C3 to C7 cycloalkyl, phenyl, naphthyl, furyl, benzofuryl or thienyl or one of said groups mono- or disubstituted with C1 to C3 alkyl, C1 to C3 alkoxy, C1 to C3 alkoxycarbonyl, trifluoromethyl, fluoro or chloro; and

n is 0 or 1; or

a pharmaceutically acceptable cationic salt thereof.

5,463,071

5-MEMBERED HETEROCYCLIC COMPOUNDS, PROCESSES FOR PREPARING THEM AND PHARMACEUTICAL COMPOSITIONS CONTAINING THESE COMPOUNDS

Frank Himmelsbach; Guenter Linz, both of Mittelbiberach; Volkhard Austel, Biberach; Helmut Pieper, Biberach; Thomas Mueller, Biberach; Johannes Weisenberger, Biberach, and Elke Seewaldt-Becker, Biberach, all of, Germany, assignors to Dr. Karl Thomae GmbH, Biberach an der Riss, Germany

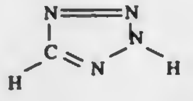
Continuation of Ser. No. 919,343, Jul. 23, 1992, abandoned. This application Nov. 8, 1993, Ser. No. 148,724

[1] **Claims priority, application Germany, Jul. 27, 1991, 41 24 942.9**

Int. Cl.^{6} C07D *257/02;257/06*

U.S. Cl. 548—251 **12 Claims**

1. A tetrazole of the formula



wherein

one of the two hydrogen atoms is replaced by a group of the formula R^A—R^B—R^C— in which

R^A represents an amino group, an aminoalkyl group with 1 to 3 carbon atoms, an amidino or guanidino group, wherein in the before mentioned groups an amino or imino group may be substituted by an alkoxycarbonyl group or by a phenylalkoxy group, wherein each of the alkoxy moieties may contain 1 to 3 carbon atoms, or a cyano group,

R^B represents a bond,

a phenylene group which may be substituted by a fluorine, chlorine or bromine atom, by an alkyl or alkoxy group, wherein the alkyl and alkoxy moiety may each contain 1 to 3 carbon atoms,

a pyridinylene, pyrimidinylene, pyrazinylene or pyridazinylene group, wherein one or two —CH=N— groups may each be replaced by a —CO—NR_1— group, wherein R_1 represents a hydrogen atom or an alkyl group containing 1 to 3 carbon atoms, and

R^C represents a phenylene group which may be substituted by fluorine, chlorine or bromine atom, by an alkyl, alkoxy, alkylsulphenyl, alkylsulphinyl or alkylsulphonyl group, wherein each alkyl or alkoxy moiety may contain 1 to 3 carbon atoms,

a pyridinylene, pyrimidinylene, pyrazinylene or pyridazinylene group optionally substituted by an alkyl group with 1 to 3 carbon atoms, wherein one or two —CH=N— groups may each be replaced by a —CO—NR_1— group, wherein R_1 is defined as hereinbefore,

a cyclohexylene group wherein one or two CH units may be replaced by a nitrogen atom,

an indanylene or 1,2,3,4-tetrahydro-naphthylene group wherein the saturated ring is bound to group R^A and the unsaturated ring is bound to the tetrazole nucleus;

and the other hydrogen atom is replaced by a group of the formula R^F—R^E—R^D–, in which

R^D represents an alkylene group containing 1 to 3 carbon atoms,

a phenylene group which may be substituted by a fluorine, chlorine or bromine atom, by an alkyl, hydroxy, alkoxy, alkylsulphenyl, alkylsulphinyl, alkylsulphonyl, nitro, amino, alkylcarbonylamino, alkylsulphonylamino, carboxyalkoxy, alkoxycarbonylalkoxy or benzamido group, wherein each alkyl or alkoxy moiety may contain 1 to 3 carbon atoms and the phenyl group of the benzamido group may be substituted by a chlorine or bromine atom or by an alkyl or alkoxy group each containing 1 to 3 carbon atoms,

a pyridinylene, pyrimidinylene, pyrazinylene or pyridazinylene group, wherein one or two —CH=N— groups may each be replaced by a —CO—NR_1— group, wherein R_1 is defined as hereinbefore, or a cyclohexylene group wherein one or two CH units may be replaced by a nitrogen atom,

R^E represents a bond,

a straight chained or branched C_{1-4}-alkylene group,

an alkenylene group with 2 to 4 carbon atoms, or

an alkylene group with 1 to 3 carbon atoms linked to the group R^D via an oxygen or sulphur atom, a sulphinyl, sulphonyl, imino or (alkylcarbonyl)imino group, wherein the alkyl moiety may contain 1 to 3 carbon atoms, and

R^F represents a carbonyl group which is substituted by a hydroxy group, by an amino group, by an alkoxy group with 1 to 5 carbon atoms, by a cycloalkoxy group with 3 to 7 carbon atoms or by an alkanoyloxy-methoxy group having a total of 2 to 6 carbon atoms in the alkanoyl moiety, by an alkoxycarbonyloxy-methoxy group having 1 to 6 carbon atoms in the alkoxy moiety, by a cycloalkanoyloxy-methoxy group having a total 4 to 8 carbon atoms in the cycloalkanoyl moiety, wherein the methoxy moiety may be substituted by a methyl group, or R^F may represent a phosphono group, a O-alkyl-phosphono or O,O'-dialkyl-phosphono group containing in each alkyl moiety 1 to 3 carbon atoms,

or a tautomer or pharmaceutically acceptable salt thereof.

5,463,072

PROCESS FOR THE PREPARATION OF NAPHTHOLIC 2-EQUIVALENT CYAN COUPLERS

Peter Bergthaller, Bergisch Gladbach, Germany, assignor to Agfa Gevart AG, D-51368, Leverkusen, Germany

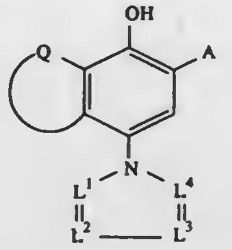
Filed May 21, 1993, Ser. No. 64,466

Claims priority, application Germany, Jun. 3, 1992, 42 18 308.1

Int. Cl.⁶ C07D *249/06;249/08;409/04;401/04*

U.S. Cl. 548—255 **12 Claims**

2. A compound of formula Ia



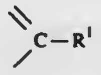
(Ia)

wherein

A denotes a group having an electron acceptor character,

denotes a group for completing a condensed benzene or pyridine ring, and

L^1, L^2, L^3 and L^4 stand for ring members, two of the ring members being each a N atom and the two others each a group of the formula



wherein R^1 denotes alkyl, alkylthio, aryl, a furyl group, a thiazolyl group or $COOR^2$ (R^2=alkyl or aryl).

5,463,073

THIENOIMIDAZOLE DERIVATIVES, THEIR PRODUCTION AND USE

Naka Takehiko, Kobe, and Inada Yoshiyuki, Kawanishi, both of, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 782,549, Oct. 25, 1991, abandoned.

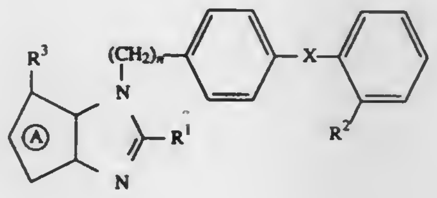
This application Aug. 27, 1993, Ser. No. 112,793

Claims priority, application Japan, Jan. 30, 1990, 2-294655; Apr. 23, 1991, 3-092081; Jun. 21, 1991, 3-150643

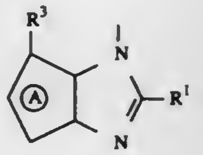
Int. Cl.⁶ A61K *31/415;* **C07D** *235/02*

U.S. Cl. 548—303.7 **20 Claims**

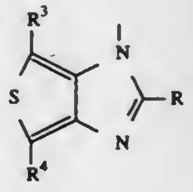
1. A compound of the formula:



wherein



is



R^1 is hydrogen or a hydrocarbon residue which may be bonded to the imidazole ring through —O—, —S(O)m— or —N(R^5)— wherein m is O 1 or 2 and R^5 represents hydrogen or C_{1-4} alkyl,

wherein the hydrobargon residue is selected from the group consisting of C_{1-8} alkyl, C_{2-8} alkenyl, C_{2-8} alkynyl, C_{3-6} cycloalkyl, phenyl-C_{1-4} alkyl and phenyl,

in which the C_{1-8} alkyl, C_{2-8} alkenyl, C_{2-8} alkynyl and C_{3-6} cycloalkyl groups are unsubstituted or substituted with hydroxyl amino methylamino, halogen, C_{1-4} alkylthio or C_{1-4} alkoxy, and the phenyl-C_{1-4} alkyl and phenyl groups are unsubstituted or substituted with halogen, nitro, C_{1-4} alkoxy and C_{1-4} alkyl on the benzene moiety,

R^2 is 1H-tetrazol-5-yl,

R^3 is a group of the formula: —CO—D' wherein D' is hydoxyl, or 1—C($_{1-6}$ alkoxy unsubstituted or substituted with C_{2-6} alkanoyloxy or alkoxycarbonyloxy on the alkyl moiety,

R^4 is hydrogen, halogen, C_{1-4} alkyl, C_{1-4} alkoxy, or amino unsubstituted or substituted by C_{1-4} alkyl,

X is a chemical bond, C_{1-4} alkylene wherein the atomic length between the phenylene group and the phenyl group is two or less, —C(=O)—, —O—, —S—, —NH—, —C(=O)—NH—, —O—CH_2—, —S—CH_2— or —CH=CH—,

n is 1 or 2,

or a pharmaceutically acceptable salt thereof.

5,463,074

IMIDAZOLYL OR IMIDAZOYLALKYL SUBSTITUTED WITH A FOUR OR FIVE MEMBERED NITROGEN CONTAINING HETEROCYCLIC RING

Neng-Yang Shih, North Caldwell; Robert Aslanian, Rockaway; Andrew Lupo, Jr., Emerson; John J. Piwinski, Parsippany; Michael J. Green, Skillman, and Ashit K. Ganguly, Upper Montclair, all of N.J., assignors to Schering Corporation, Kenilworth, N.J.

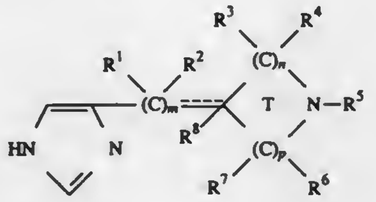
PCT No. PCT/US92/10743, § 371 Date Jun. 15, 1994, § 102(e) Date Jun. 15, 1994

Continuation-in-part of Ser. No. 809,781, Dec. 18, 1991, abandoned. This PCT application Dec. 17, 1992, Ser. No. 244,851

Int. Cl.^{6} C07D *401/06;403/06;409/06;* **A61K** *31/415*

U.S. Cl. 548—314.7 **19 Claims**

1. A compound of the formula:



(I)

or a pharmaceutically acceptable salt or solvate thereof, wherein:

(A) m is an integer selected from the group consisting of: 0, 1, and 2;

(B) n and p are integers and are each independently selected from the group consisting of: 0, 1, 2, and 3 such that the sum of n and p is 2 or 3 such that when the sum of n and p is 2, T is a 4-membered ring and when the sum of n and p is 3, T is a 5-membered ring;

(C) each R^1, R^2, R^3, R^4, R^6, R^7, and R^8 is independently selected from the group consisting of:

(1) H;

(2) C_1 to C_6 alkyl;

(3) C_3 to C_6 cycloalkyl; and

(4) $—(CH_2)_q—R^9$ wherein q is an integer of: 1 to 7, and R^9 is selected from the group consisting of: phenyl, substituted phenyl, $—OR^{10}$, $—C(O)OR^{10}$, $—C(O)R^{10}$, $—OC(O)R^{10}$, $—C(O)NR^{10}R^{11}$, CN and $—SR^{10}$ wherein R^{10} and R^{11} are as defined below, and wherein the substituents on said substituted phenyl are each independently selected from the group consisting of: —OH, —O—(C_1 to C_6)alkyl, halogen, C_1 to C_6 alkyl, $—CF_3$, —CN, and $—NO_2$, and wherein said substituted phenyl contains from 1 to 3 substituents;

(D) R^5 is selected from the group consisting of:

(1) H;

(2) C_1 to C_{20} alkyl;

(3) C_3 to C_6 cycloalkyl;

(4) $—C(O)OR^{10'}$; wherein $R^{10'}$ is the same as R^{10} defined below except that $R^{10'}$ is not H;

(5) $—C(O)R^{10}$;

(6) $—C(O)NR^{10}R^{11}$;

(7) allyl;

(8) propargyl; and

(9) $—(CH_2)_q—R^9$, wherein q and R^9 are as defined above with the proviso that when q is 1 then R^9 is not —OH or —SH;

(E) R^{10} and R^{11} are each independently selected from the group consisting of: H, C_1 to C_6 alkyl, and C_3 to C_6 cycloalkyl; and, for the substituent $—C(O)NR^{10}R^{11}$, R^{10} and R^{11}, together with the nitrogen to which they are bound, can form a ring having 5, 6, or 7 atoms;

(F) the dotted line (. . .) represents a double bond that is optionally present when m is 1, and T is a 5-membered ring, and n is not 0, and p is not 0, and when said double bond is present then R^2 and R^8 are absent;

(G) when m is 2, each R^1 is the same or different substituent for each m, and each R^2 is the same or different substituent for each m;

(H) when n is 2 or 3, each R^3 is the same or different substituent for each n, and each R^4 is the same or different substituent for each n; and

(I) when p is 2 or 3, each R^6 is the same or different substituent for each p, and each R^7 is the same or different substituent for each p.

5,463,075

PROCESS FOR PREPARING 1,2-PYRAZOLIDINE-4-YL-DISULFIDE COMPOUND

Motoshige Sumino; Tsutomu Tani, and Atsunori Sano, all of Kawagoe, Japan, assignors to WAKO Pure Chemical Industries, Ltd., Kawagoe, Japan

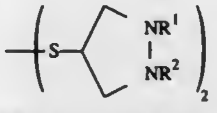
Filed Sep. 6, 1994, Ser. No. 300,808

Claims priority, application Japan, Sep. 6, 1993, 5-245910

Int. Cl.^{6} C07D *231/04*

U.S. Cl. 548—365.1 **5 Claims**

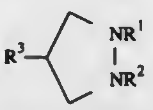
1. A process for preparing a 1,2-pyrazolidine-4-yl-disulfide compound represented by the following formula:



(II)

wherein R^1 and R^2 are, independently each other, a hydrogen atom or an amino-protecting group,

which comprises reacting a compound of the formula:



(I)

wherein R^3 is an acid anion residue group, and

R^1 and R^2 have the same meanings as above, with a disulfide compound selected from the group consisting of an alkali metal disulfide, an alkali earth metal disulfide, an ammonium disulfide and a tri-alkylammonium disulfide, to give a compound represented by formula (II).

5,463,076

METHOD OF MAKING MULTIDIMENSIONAL OLIGOMERS

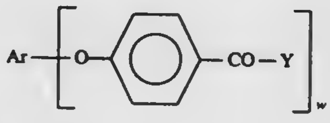
Clyde H. Sheppard, Bellevue, Wash., and Hyman R. Lubowitz, Rolling Hills Estates, Calif., assignors to The Boeing Company, Seattle, Wash.

Division of Ser. No. 605, Jan. 5, 1987, Pat. No. 5,210,213, which is a continuation-in-part of Ser. No. 810,817, Dec. 17, 1985, abandoned, which is a continuation-in-part of Ser. No. 726,258, Apr. 23, 1985, abandoned, which is a continuation-in-part of Ser. No. 519,394, Aug. 1, 1983, abandoned, and a continuation-in-part of Ser. No. 673,229, Nov. 20, 1984, Pat. No. 4,584,364, and a continuation-in-part of Ser. No. 536,350, Sep. 27, 1983, abandoned, and a continuation-in-part of Ser. No. 505,348, Jun. 17, 1983, Pat. No. 4,536,559, and a continuation-in-part of Ser. No. 651,826, Sep. 18, 1984, abandoned, which is a continuation-in-part of Ser. No. 536,350, Sep. 27, 1983, abandoned, and a continuation-in-part of Ser. No. 576,790, Feb. 6, 1984, abandoned, and a continuation-in-part of Ser. No. 505,348, Jun. 17, 1983, Pat. No. 4,536,559, said Ser. No. 673,229is a continuation of Ser. No. 576,790, Feb. 6, 1984, abandoned, which is a continuation-in-part of Ser. No. 321,119, Nov. 13, 1981, abandoned, said Ser. No. 536,350is a continuation-in-part of Ser. No. 519,394, Aug. 1, 1983, abandoned. This application Mar. 26, 1993, Ser. No. 38,750

Int. Cl.^{6} C07D *403/12;519/00*

U.S. Cl. 548—431 **2 Claims**

1. A method for making an oligomer of the general formula:

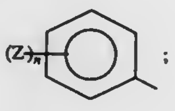


wherein

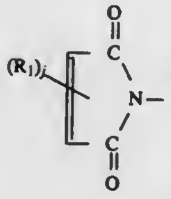
Ar=an aromatic moiety selected from the group consisting of phenyl, biphenyl, naphthyl, and azalinyl;

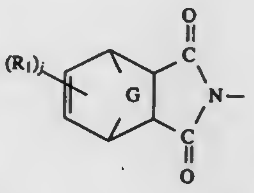
w=3 or 4;

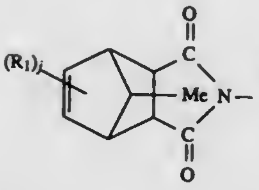
Y=

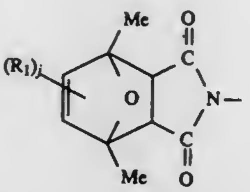


n=1 or 2;









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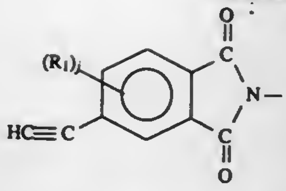
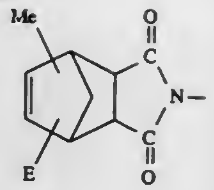




R_1=any of lower alkyl, lower alkoxy, or aryl;

j=0, 1, or 2;

G=—CH_2—, —S—, —O—, or —SO_2—,

Me=methyl; and

E=allyl or methallyl,

comprising the steps of:

(a) reacting Ar-(X)$_w$ with at least w moles of phenol in an Ullmann ether synthesis in DMAC and a base in the presence of an Ullmann copper catalyst to form an Ar— ether intermediate; and (b) reacting the Ar— ether intermediate with at least w moles of Y—COX under Friedel-Crafts conditions in a suitable solvent to produce the oligomer, wherein X=halogen.

5,463,077

PERHYDROISOINDOLE DERIVATIVES AND PREPARATION

Daniel Achard, Thiais; Serge Grisoni, Choisy-le-Roi; Jean-Luc Malleron, Marcoussis; Jean-Francois Peyronel, Palaiseau, and Michel Tabart, Paris, all of, France, assignors to Rhone-Poulenc Rorer S.A., Antony, France

PCT No. PCT/FR93/00351, § 371 Date Oct. 11, 1994, § 102(e) Date Oct. 11, 1994, PCT Pub. No. WO93/21154, PCT Pub. Date Oct. 28, 1993

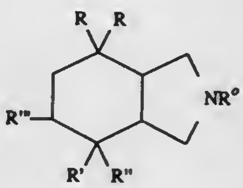
PCT Filed Apr. 8, 1993, Ser. No. 313,120

Claims priority, application France, Apr. 10, 1992, 92/04391

Int. Cl.^{6} C07D *209/04*

U.S. Cl. 548—515 **4 Claims**

1. A perhydroisoindole derivative of formula:



in which:

the symbols R are identical and represent phenyl radicals which are optionally substituted by a halogen atom or by a methyl radical in position 2 or 3,

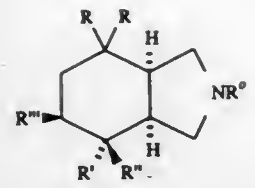
the symbol R' represents a phenyl radical which is optionally substituted in position 2 by a alkyl or alkyloxy radical containing 1 to 2 carbon atoms,

the symbol R'' represents a fluorine atom or a hydroxyl radical and the symbol R''' represents a hydrogen atom, or

the symbols R'' and R''' represent hydroxyl radicals, or

the symbol R'' forms a bond with R''', and

the symbol R° represents a hydrogen atom or represents a protective radical, in the racemic form, in its stereoisomeric forms having the structure:



wherein R, R', R'', R''' and R° are as defined above, or in the form of a mixture, as well as its salts, thereof.

5,463,078

ANISOMYCIN DERIVATIVES AND ANTICANCER AGENTS, ANTIFUNGAL AGENTS AND ANTIPROTOZOAN AGENTS CONTAINING THE SAME

Yukio Iino; Makoto Ishii; Koji Ohsumi, and Takashi Tsuji, all of Kawasaki, Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

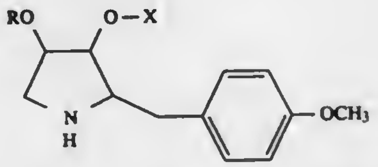
Filed Feb. 15, 1994, Ser. No. 196,508

Claims priority, application Japan, Feb. 15, 1993, 5-025447; Nov. 24, 1993, 5-293059

Int. Cl.⁶ C07D *207/12;* **C12P** *17/10;* C12N *1/20;* C12R *1/465*

U.S. Cl. 548—541 **15 Claims**

1. An anisomycin compound of the following formula or a pharmaceutically acceptable salt thereof:



wherein R is a hydrogen atom or a saturated or unsaturated alkylcarbonyl group having 1 to 18 carbon atoms; and X is either a carbamoyl group of the formula —CONR^{1}R^2 or an alkyl group of the formula —CH$_2$R^3, wherein each of R^1 and R^2 is independently a hydrogen atom, a linear or cyclic alkyl group having 1 to 6 carbon atoms which may be substituted, or a phenyl group which may be substituted, and R^3 is a hydrogen atom, an alkyl group having 1 to 6 carbon atoms, or an alkoxy group having 1 to 6 carbon atoms, which may be substituted; with the proviso that (a) when R^1 or R^2 is a substituted linear or cyclic alkyl group having 1 to 6 carbon atoms, the group is substituted with one or more substituents selected from the group consisting of halogen atoms, hydroxy groups, carboxy groups, alkoxy groups of 1 to 4 carbon atoms and cyano groups, (b) when R^1 or R^2 is a substituted phenyl group, the phenyl group is substituted with one or more substituents selected from the group consisting of halogen atoms, hydroxy groups, carboxy groups, alkoxy groups of 1 to 4 carbon atoms, cyano groups, alkyl groups of 1 to 6 carbon atoms, alkenyl groups of 1 to 6 carbon atoms, alkynyl groups of 1 to 6 carbon atoms, halogenated alkyl groups of 1 to 6 carbon atoms, halogenated alkenyl groups of 1 to 6 carbon atoms, and halogenated alkynyl groups of 1 to 6 carbon atoms, and (c) when R^3 is a substituted alkoxy group having 1 to 6 carbon atoms, said group is substituted with a substituent selected from the group consisting of, one or more halogen atoms, hydroxy groups, carboxy groups, alkoxy groups of 1 to 4 carbon atoms, cyano groups, alkyl groups of 1 to 6 carbon atoms, alkenyl groups of 1 to 6 carbon atoms, alkynyl groups of 1 to 6 carbon atoms, halogenated alkyl groups of 1 to 6 carbon atoms, halogenated alkenyl groups of 1 to 6 carbon atoms, or halogenated alkynyl groups of 1 to 6 carbon atoms.

5,463,079

PREPARATION OF FIVE-MEMBERED NITROGEN HETEROCYCLES

Rolf Pinkos, Bad Duerkheim, and Rolf Fischer, Heidelberg, both of, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

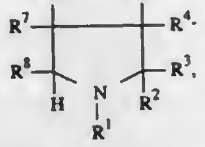
Filed Jun. 27, 1994, Ser. No. 266,143

Claims priority, application Germany, Jul. 1, 1993, 43 21 843.1

Int. Cl.⁶ C07D *207/263;207/38;207/02*

U.S. Cl. 548—543 **6 Claims**

1. A process for preparing five-membered nitrogen heterocycles of the general formula I



(I)

where, independently of each other,

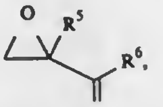
R^1, R^2, R^3, R^4, R^5, R^6, R^7 and R^8 may each represent hydrogen, R^1 is also C$_1$–C$_{10}$-alkyl, C$_1$–C$_{10}$-hydroxyalkyl, C$_1$–C$_{10}$-aminoalkyl, aryl, C$_7$–C$_{10}$-aralkyl or C$_7$–C$_{10}$-alkylaryl,

where taken together,

R^2 and R^3 may further represent oxygen with the proviso that R^8 is hydrogen, and each of the paired substituents R^3 and R^4, R^7 and R^8 and R^4 and R^7 may each represent a bond with the proviso that R^4 and R^7 do not represent said bond when one or both of the other two paired substituents represent said bond,

which process comprises:

reacting a vinyloxirane of the general formula II



(II)

where R^5 and R^6 have the abovementioned meanings, with ammonia or a primary amine of the general formula III

R^1—NH$_2$ (III),

where R^1 has the abovementioned meanings, in the presence of a compound of an element of Group VIIIb or Ib of the Periodic Table, with or without the addition of a Lewis acid, at a temperature from 20° to 200° C. and under a pressure from 1 to 70 bar, and subsequently cyclizing in the presence of hydrogen and a hydrogenation catalyst at temperatures from 150° to 350° and under pressures from 0.1 to 300 bar.

5,463,080

2,4,6-TRIIODO-1,3-BENZENEDICARBOXYLIC ACID COMPOUNDS USED AS RADIOLABELLING REAGENTS

Marc Ogan, Somerset; Frank P. Tomasella, Englishtown, and Jan-I Tu, Lawrenceville, all of N.J., assignors to Bracco International B.V., Amsterdam, Netherlands

Filed Aug. 27, 1992, Ser. No. 936,432

Int. Cl.⁶ A61K *49/04;51/04;* **C07C** *63/14;* **C07D** *207/40*

U.S. Cl. 548—545 **9 Claims**

1. 5-[(4-carboxy-1-oxobutyl)amino]-2,4,6-triiodo-1,3-benzenedicarboxylic acid, dimethyl ester.

5,463,081

ARYLSULFONYLUREAS, PROCESSES FOR THEIR PREPARATION, AND THEIR USE AS HERBICIDES AND GROWTH REGULATORS

Oswald Ort, Kelkheim; Klaus Bauer, Hanau, and Hermann Bieringer, Eppstein/Taunus, all of, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Germany

PCT No. PCT/EP92/00304, § 371 Date Sep. 21, 1993, § 102(e) Date Sep. 21, 1993, PCT Pub. No. WO92/13845, PCT Pub. Date Aug. 20, 1992

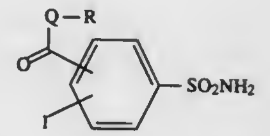
PCT Filed Feb. 12, 1992, Ser. No. 94,194

Claims priority, application Germany, Feb. 12, 1991, 41 04 227.1

Int. Cl.^{6} C07C *265/00;311/16;* **C07D** *339/08;333/10*

U.S. Cl. 549—13 **21 Claims**

1. A compound of formula (II)

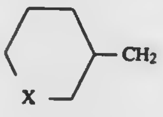


wherein

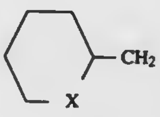
Q is an oxygen atom, sulfur atom or a group of formula —N(R^4)—,

R^4 is hydrogen, (C_1–C_4)alkyl or (C_1–C_4)alkoxy,

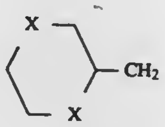
R is hydrogen; (C_1–C_{12})alkyl; (C_2–C_{10})alkenyl; (C_2–C_{10})alkynyl; (C_1–C_6)alkyl, which is monosubstituted to tetrasubstituted by radicals selected from the group consisting of halogen, (C_1–C_4)alkoxy-, (C_1–C_4)thio-alkyl, —CN, (C_2–C_5)alkoxycarbonyl and (C_2–C_6)alkenyl; (C_3–C_8)cycloalkyl which is unsubstituted or substituted by radicals selected from the group consisting of (C_1–C_4)-alkyl, (C_1–C_4)alkoxy, (C_1–C_4)alkylthio and halogen; (C_5–C_8)cycloalkenyl; phenyl(C_1–C_4)alkyl which is unsubstituted or substituted in the phenyl radical; or a radical of the formulae A-1 to A-10



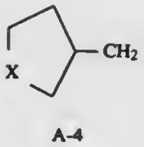
A-1



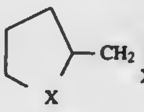
A-2



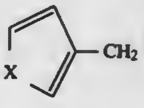
A-3



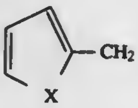
A-4



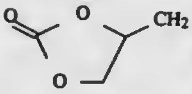
A-5



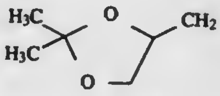
A-6



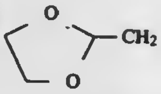
A-7



A-8



A-9



A-10

and

X is O, S, S(O) or SO_2,

with the exception of 3-aminosulfonyl-4-iodobenzoic acid.

5,463,082

FLUOROUS MULTIPHASE SYSTEMS

Istvan T. Horvath, New Hope, Pa., and Jozsef Rabai, Clinton, N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Jul. 8, 1993, Ser. No. 88,706

Int. Cl.^{6} C07D *333/76;* **C07C** *37/58;315/02;45/62*

U.S. Cl. 549—46 **10 Claims**

1. A method of carrying out homogeneous catalytic chemical reactions, comprising:

forming a homogeneous liquid fluorous phase containing a fluorous solvent selected from the group consisting of fluorocarbons, fluorohydrocarbons, substituted fluorocarbons and substituted fluorohydrocarbons and mixtures thereof and a homogeneous catalyst functionalized to contain a sufficient number of fluorous moieties having the formula $(R)_n(Rf)_m$, wherein $(R)_n$ is a hydrocarbon domain and may be present or absent and n is an integer equal to at least zero and $(Rf)_m$ is at least one fluoroalkyl fluorous domain and m is a whole number, to render the functionalized catalyst preferentially soluble in the fluorous solvent; and

contacting the functionalized catalyst with a nonfluorous phase containing a nonfluorous solvent having limited miscibility in the fluorous phase and having a Hildebrand solubility parameter of at least about 18.0 mPa½ and a reactant convertible in the presence of the functionalized catalyst to a product having low solubility in the fluorous solvent, wherein said contacting is carried out at conditions sufficient to produce said product.

5,463,083

COMPOUNDS AND METHODS FOR THE TREATMENT OF CARDIOVASCULAR, INFLAMMATORY AND IMMUNE DISORDERS

Tesfaye Biftu, Belmont; Xiong Cai, Framingham; Sajjet Hussion, Lexington; Gurmit Grewal, Waltham, all of Mass., and T. Y. Shen, Charlottesville, Va., assignors to Cytomed, Inc., Cambridge, Mass.

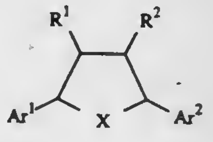
Continuation-in-part of Ser. No. 62,391, May 12, 1993, which is a continuation-in-part of Ser. No. 933,911, Aug. 24, 1992, which is a continuation-in-part of Ser. No. 912,788, Jul. 13, 1992, Pat. No. 5,358,938. This application Jan. 6, 1994, Ser. No. 178,222

The portion of the term of this patent subsequent to Oct. 25, 2011, has been disclaimed.

Int. Cl.^{6} C07D *333/38;309/07;* **C07C** *43/02*

U.S. Cl. 549—71 **27 Claims**

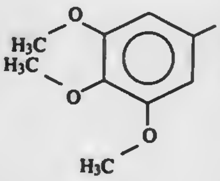
1. A compound of the formula:

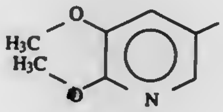


Formula I

wherein:

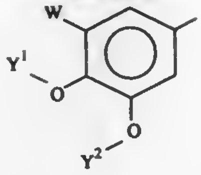
Ar^1 is either





Ar^2 is

-continued



and wherein:

W is independently selected from the group consisting of:
- —AN(OM)C(O)N(R^3)R^4,
- —AN(R^3)C(O)N(OM)R^4,
- —AN(OM)C(O)R^4,
- —AC(O)N(OM)R^4,
- —N(OM)C(O)N(R^3)R^4,
- —N(R^3)C(O)N(OM)R^4,
- —N(OM)C(O)R^4,
- —C(O)N(OM)R^4,
- —S(O)$_n$R^3,
- —S(O)$_n$CH$_2$C(O)A,
- —S(O)$_n$CH$_2$CH(OH)A,
- and —C(O)NHA,

X is 0, S, S(O), CR^5;

Y^1, Y^2 are independently selected from the group consisting of:
- (a) hydrogen;
- (b) lower alkyl, lower alkoxy, lower alkenyl, lower alkynyl, alkylaryl;
- (c)
  - —AN(OM)C(O)N(R^3)R^4,
  - —AN(R^3)C(O)N(OM)R^4,
  - —AN(OM)C(O)R^4,
  - —AC(O)N(OM)R^4,
  - —AN(R^3)C(O)N(OM)R^4,
  - —C(O)N(OM)R^4, and
  - —C(O)NHR^3;

  wherein A is selected from the group consisting of substituted or unsubstituted lower alkyl, lower alkyl-alkoxy, lower alkenyl, lower alkynyl, alkaryl or aralkyl;

M is selected from hydrogen, a pharmaceutically acceptable cation, and a metabolically cleavable leaving group;

R^1 and R^2 are independently selected from hydrogen, lower alkyl, C$_{3-8}$ cycloalkyl, halo lower alkyl, halo, —COOH;

R^3 and R^4 are independently selected from the group consisting of hydrogen, substituted or unsubstituted alkyl, substituted or unsubstituted alkyl where one or more carbon atoms are replaced by S, N, or O, substituted or unsubstituted cycloalkyl of from 3 to 8 carbon atoms, substituted or unsubstituted cycloalkyl of from 3 to 8 carbon atoms, where one or more carbons are replaced by S, N, or O, alkenyl, alkynyl, aryl, aralkyl, alkaryl, C$_{1-6}$ alkoxy-C$_{1-10}$ alkyl, C$_{1-6}$ alkylthio-C$_1$ alkyl, C$_{1-6}$ hydroxy-C$_{1-6}$ alkyl, C$_{1-6}$ carbonyl-C$_{1-6}$ alkyl, C$_{1-6}$ amino-C$_{1-6}$ alkyl;

R^1 is selected from the group consisting of:
- (a) hydrogen;
- (b) lower alkyl, lower alkenyl, lower alkynyl, alkaryl;
- (c)
  - —AN(OM)C(O)N(R^3)R^4,
  - —AN(R^3)C(O)N(OM)R^4,
  - —AN(OM)C(O)R^4,
  - —AC(O)N(OM)R^4,
  - —AC(O)N(OM)R^4,
  - —AS(O)$_n$R^3,
  - —AS(O)$_n$CH$_2$C(O)R^3,
  - —AS(O)$_n$CH$_2$CH(OH)R^3,
  - —AC(O)NHR^3;

  wherein each n is independently 0, 1 or 2; A is selected from the group consisting of substituted or unsubstituted lower alkyl, lower alkyl-alkoxy, lower alkenyl, lower alkynyl, alkaryl or aralkyl; M is selected from hydrogen, a pharmaceutically acceptable cation, or a metabolically clearable leaving group.

5,463,084

PHOTOCURABLE SILICONE OXETANES

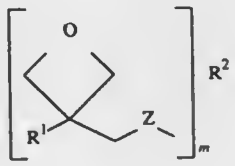
James V. Crivello, Clifton Park, N.Y., and Hiroshi Sasaki, Nagoya, Japan, assignors to Rensselaer Polytechnic Institute, Troy, N.Y.

Continuation-in-part of Ser. No. 837,473, Feb. 18, 1992, abandoned. This application Feb. 1, 1993, Ser. No. 11,892

Int. Cl.^{6} C07D *305/04;407/02;* **C08G** *65/14;77/14*

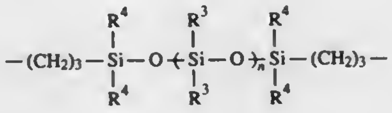
U.S. Cl. 549—214 **7 Claims**

1. A compound of formula



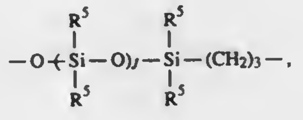
wherein R^1 is alkyl of 1 to 6 carbons;

R^2 is



$$-(CH_2)_3-\underset{R^4}{\overset{R^4}{Si}}-O\left(\underset{R^3}{\overset{R^3}{Si}}-O\right)_n\underset{R^4}{\overset{R^4}{Si}}-(CH_2)_3-$$

R^3 is chosen from the group consisting of alkyl of 1–4 carbons and



$$-O\left(\underset{R^5}{\overset{R^5}{Si}}-O\right)_j-\underset{R^5}{\overset{R^5}{Si}}-(CH_2)_3-,$$

R^4 is alkyl of 1 to 4 carbons;

R^5 is alkyl of 1 to 4 carbons;

Z is oxygen or sulfur;

j is zero or an integer from 1 to 100;

m is 3, 3 or 4; and

n is an integer from zero to 2000.

5,463,085

SYNTHESIS METHOD OF PHYSIOLOGICALLY ACTIVE DELTA-LACTONE

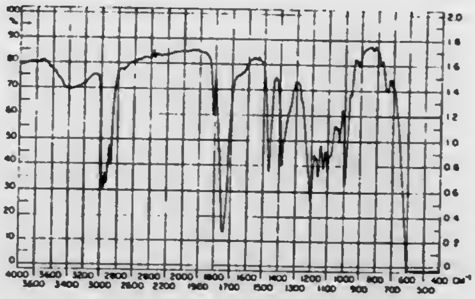
Tetsuo Omata, and Kaichi Tanida, both of Osaka, Japan, assignors to Nitto Denko Corporation, Osaka, Japan

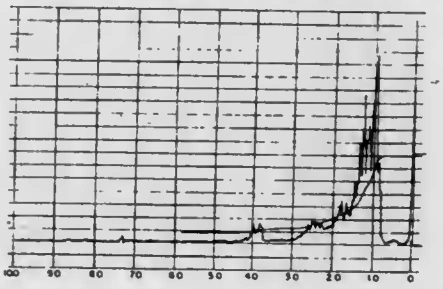
Filed Jun. 9, 1994, Ser. No. 257,523

Claims priority, application Japan, Jun. 10, 1993, 5-166041

Int. Cl.^{6} C07D *309/30*

U.S. Cl. 549—273 **12 Claims**





1. A synthesis method of physiologically active δ-lactone, which comprises addition-reacting diethyl methylmalonate and methacrolein in the presence of a base, wherein the base is L-proline lithium salt.

5,463,086

PROCESS FOR PRODUCING LACTIDES AND PROCESS FOR PURIFYING CRUDE LACTIDES

Kazuomi Kubota, and Yoichi Murakami, both of Chiba, Japan, assignors to Dainippon Ink and Chemicals, Inc., Tokyo, Japan

Filed Mar. 8, 1994, Ser. No. 207,197

Claims priority, application Japan, Mar. 24, 1993, 5-65201; Mar. 31, 1993, 5-73466

Int. Cl.^{6} C07D *319/00*

U.S. Cl. 549—274 **5 Claims**

1. A process for purifying a crude lactide comprising recrystallizing a crude lactide using (A) a poor solvent in which said lactide has a solubility of not more than 1% by weight at 23° C. and (B) a good solvent in which said lactide has a solubility of not less than 5% by weight at 23° C., wherein said good solvent has a boiling point of at least 50° C.

5,463,087

SUBSTITUTED DERIVATIVES OF DEOXYMYOINOSITOL, PROCESS FOR THEIR PREPARATION AND THEIR USE IN MEDICAMENTS

Erwin Bischoff; Zhan Gao, both of Wuppertal; Stefan Wohlfeil, Hilden; Gabriele Hecker, Wuppertal, all of, Germany; Jeannine Cleophax, Palaiseau, France; Didier Dubreuil, Juvisy/Orge, France; Stéphane Gero, Les Ulis, France; Alice Olesker, Gif-sur-Yvette, France; Catherine Verre-Sebrie, Les Ulis, France; Mauro Vieira de Almeida, and Georges Vass, both of Gif-sur-Yvette, France, assignors to Bayer Pharma, Sens, France

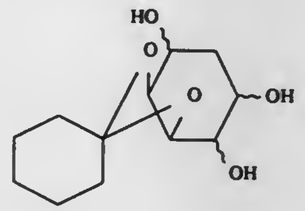
Division of Ser. No. 106,156, Aug. 12, 1993, Pat. No. 5,407,923. This application Jan. 13, 1995, Ser. No. 372,090

Claims priority, application France, Aug. 18, 1992, 92 10109

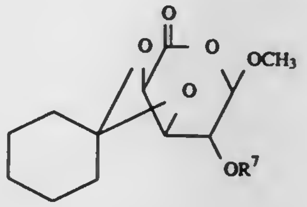
Int. Cl.^{6} C07D *317/72*

U.S. Cl. 549—336 **4 Claims**

1. A process for the preparation of a compound of the formula

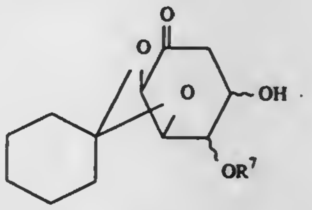


which comprises reacting a compound of the formula



in which

R^7 is a hydroxyl - protecting group, with mercuric chloride and thiourea, in the presence of acetone and water, thereby to obtain a compound of the formula



thereafter selectively reducing the carbonyl group with cerous chloride and sodium borohydride in methanol or lithium borohydride in tetrahydrofuran thereby to produce a hydroxyl group in the axial or equatorial position depending on the reducing agent and the steric configuration of the other substituents on the ring, carrying out a Mitsunobu reaction to block the two free hydroxyl groups and give them the same steric configuration, and finally clearing off the protecting group R^7.

5,463,088
PROCESS FOR PREPARING PERFLUOROALKOXY (ALKYLTHIO) BENZENES

Norbert Lui, Cologne; Albrecht Marbold, Leverkusen, and Karl-Rudolf Gassen, Ratingen, all of, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

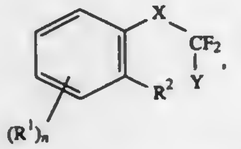
Filed Apr. 26, 1994, Ser. No. 233,488

Claims priority, application Germany, May 3, 1993, 43 14 498.5

Int. Cl.^{6} C07D *319/20;317/46;* **C07C** *43/205;321/30*

U.S. Cl. 549—362 **8 Claims**

1. A process for preparing perfluoroalkoxy(alkylthio)-benzenes of the formula (I),


(I)

in which

R^1 represents fluorine, chlorine, bromine, C_1–C_4-fluoroalkyl, COF, C_1–C_4-alkyl, C_1–C_4-alkoxy or C_1–C_4-fluoroalkoxy,

R^2 represents hydrogen, C_1–C_4-fluoroalkyl, fluorine, chlorine or bromine and

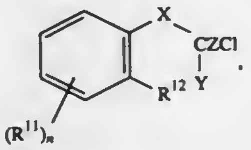
Y represents C_1–C_4-fluoroalkyl or

R^2 and Y together represent an oxygen or sulphur atom or an —$OCHal_2$— or —$SCHal_2$-group, with R^2 then marking the position of the O or S atom and Hal_2 in each case being Cl_2, FCl or F_2,

n represents zero, 1 or 2 and

X represents oxygen or sulphur,

which process comprises that a perfluorochloroalkoxy(alkylthio)benzene of the formula (II)


(II)

in which

X, Y and n have the meaning given above and

R^{11} represents fluorine, chlorine, bromine, C_1–C_4-halogenoalkyl, COF, COCl, C_1–C_4-alkyl, C_1–C_4-alkoxy or C_1–C_4-halogenoalkoxy,

R^{12} represents hydrogen, C_1–C_4-halogenoalkyl, fluorine, chlorine or bromine or

R^{12} and Y together have the meaning given above for R^2 and Y together and

Z represents fluorine or chlorine,

is reacted with hydrogen fluoride in the gas phase and in the presence of a catalyst selected from the group consisting of chlorides, fluorides and oxides of copper, chromium, iron, bismuth, zinc, lanthanum, cerium, zirconium, vanadium, molybdenum, tungsten, nickel, and combinations thereof.

5,463,089
PREPARATION OF AMBROX

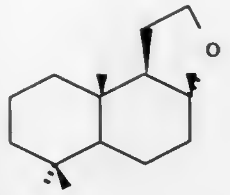
Derek H. R. Barton; Shyamal I. Parekh; Dennis K. Taylor, and Chi-lam Tse, all of College Station, Tex., assignors to Quest International B.V., Vlaardingen, Netherlands

Filed Jul. 22, 1994, Ser. No. 279,160

Int. Cl.^{6} C07D *307/92*

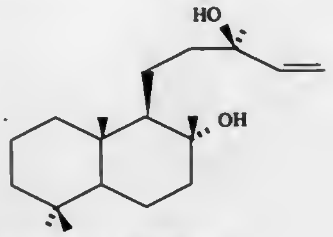
U.S. Cl. 549—458 **7 Claims**

1. A process for preparing (-)-dodecahydro-3a,6,6,9a-tetramethylnaphtho(2,1-b)furan of the formula (1):

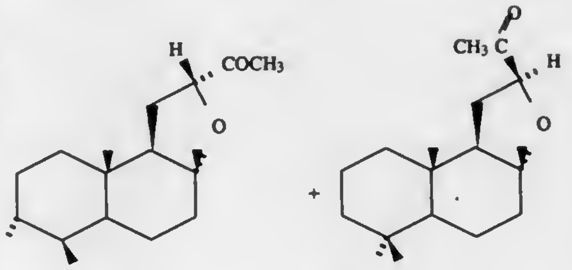

(1)

which comprises:

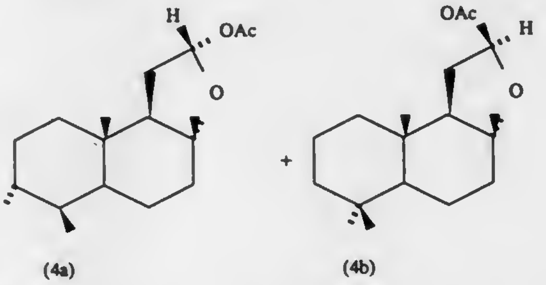
(i) converting sclareol of the formula (2)


(2)

to methyl ketones of the formulae:


(4a) (4b)

(ii) converting said ketone (4a) or mixture thereof with (4b) to, respectively, an acetate of the formula (5a) or mixture of acetates (5a) and (5b):


(4a) (4b)

and

(iii) converting said acetate (5a) or acetate mixture (5a) and (5b) to said compound (1).

5,463,090
INTEGRATED PROCESS FOR EPOXIDE PRODUCTION

Carmen L. Rodriguez, Exton, and John G. Zajacek, Devon, both of Pa., assignors to Arco Chemical Technology, L.P., Greenville, Del.

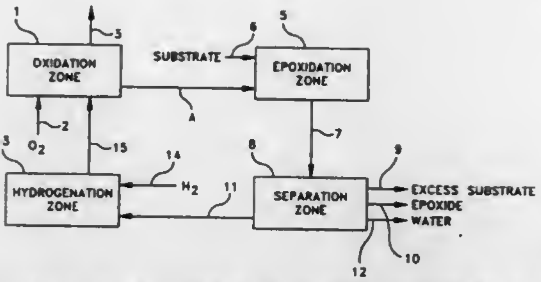
Filed Oct. 27, 1994, Ser. No. 330,057

Int. Cl.^{6} C07D *301/12;303/04*

U.S. Cl. 549—531 **24 Claims**

1. A integrated process for producing an epoxide comprising

(a) reacting a sulfonic acid-substituted anthrahydroquinone alkylammonium salt with molecular oxygen to form an oxidation



reaction product comprised of hydrogen peroxide and a sulfonic acid-substituted anthraquinone alkylammonium salt;

(b) contacting the oxidation reaction product with an ethylenically unsaturated substrate and a catalytically effective amount of a titanium silicalite to form an epoxidation reaction mixture comprised of a sulfonic acid-substituted anthraquinone alkylammonium salt and the epoxide;

(c) separating the epoxide from the sulfonic acid-substituted anthraquinone alkylammonium salt;

(d) reacting the sulfonic acid-substituted anthraquinone alkylammonium salt with hydrogen in the presence of a transition metal-containing hydrogenation catalyst to convert the sulfonic acid-substituted anthraquinone alkylammonium salt to the sulfonic acid-substituted anthrahydroquinone alkylammonium salt; and

(e) recycling the sulfonic acid-substituted anthrahydroquinone alkylammonium salt from step (d) for use in step (a).

5,463,091

DIGLYCIDYL ETHER OF 4,4'-DIHYDROXY-α-METHYLSTILBENE

Jimmy D. Earls; Robert E. Hefner, Jr., and Paul M. Puckett, all of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 99,812, Jul. 29, 1993, abandoned, which is a division of Ser. No. 919,791, Jul. 27, 1992, Pat. No. 5,270,405, which is a continuation-in-part of Ser. No. 616,539, Nov. 21, 1990, abandoned, which is a continuation-in-part of Ser. No. 553,492, Jul. 13, 1990, abandoned, which is a continuation-in-part of Ser. No. 298,431, Jan. 17, 1989, abandoned. This application Jun. 2, 1994, Ser. No. 252,811

Int. Cl.^{6} C07D *303/18*

U.S. Cl. 549—560 **1 Claim**

1. The diglycidyl ether of 4,4'-dihydroxy-α-methylstilbene.

5,463,092

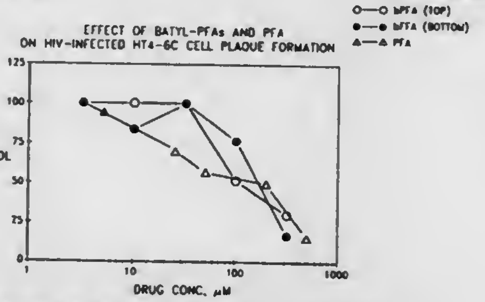
LIPID DERIVATIVES OF PHOSPHONACIDS FOR LIPOSOMAL INCORPORATION AND METHOD OF USE

Karl Y. Hostetler, Del Mar, and Raj Kumar, San Diego, both of Calif., assignors to Vestar, Inc., San Dimas, Calif.

Continuation-in-part of Ser. No. 440,898, Nov. 22, 1989, Pat. No. 5,194,654. This application Dec. 18, 1992, Ser. No. 993,133

Int. Cl.^{6} C07C *233/00*

U.S. Cl. 554—40 **13 Claims**



1. A compound having antiviral activity, comprising:

a phosphonoacid selected from the group consisting of phosphonoformic acid and phosphonoacetic acid; and

a lipid selected from the group consisting of sphingolipids, glycolipids, ceramide or glycerolipids, wherein said phosphonoacid is linked to said lipid by a carboxyester linkage provided that when the glycerolipid comprises a single glycerol moiety, the phosphonoacid is linked thereto at the sn-glycero-3-position.

5,463,093

PALLADIUM COMPLEXES AND METHODS FOR USING SAME IN THE TREATMENT OF TUMORS OR PSORIASIS

Merrill Garnett, 178 W. Main St., East Islip, N.Y. 11730

Filed Nov. 26, 1993, Ser. No. 157,570

Int. Cl.^{6} C07B *45/00*

U.S. Cl. 554—102 **20 Claims**

1. A complex of palladium or a palladium salt and lipoic acid, the palladium bonded to lipoic acid via both the sulfurs and the carboxyl group oxygens of lipoic acid.

5,463,094

SOLVENT FREE QUATERNIZATION OF TERTIARY AMINES WITH DIMETHYLSULFATE

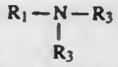
David M. Brown, Charlotte, N.C.; Erich M. Gatter, Kastl, Germany, and Cheryl A. Littau, Charlotte, N.C., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Filed May 23, 1994, Ser. No. 247,804

Int. Cl.^{6} C07C *219/02; 209/00*

U.S. Cl. 554—110 **8 Claims**

1. A method for the high temperature, solvent free quaternization of tertiary amines of Formula I



$$R_1-\underset{\displaystyle R_3}{\underset{|}{N}}-R_3$$

Formula I

wherein each of R_1, R_2 and R_3 is independently selected from the group consisting of

a) C_1–C_{20} alkyl;

b) C_2–C_{20} alkenyl;

c) C_2–C_{20}alkynyl;

d) hydroxy C_1–C_{20} alkyl;

e) dihydroxy C_1–C_{20} alkyl;

f) poly(oxyethylene) of the formula —$(CH_2CH_2O)_xH$, where x is an integer from 1 to 20;

g) poly(oxypropylene) of the formula —$(CH_2CH(CH_3)O)_yH$, where y is an integer from 1 to 50;

h) copolymers of ethylene oxide units of formula —(CH_2CH_2O)— and propylene oxide units of formula —$(CH_2CH(CH_3)O)$, wherein said units are (i) arranged randomly, in alternating units or in blocks; and (ii) terminated with —$(CH_2CH_2O)H$ or —$(CH_2CH(CH_3)O)H$; and (iii) the total number of ethylene oxide and propylene oxide units is 2–70;

- i) carboxylate esters formed by reacting a moiety selected from the group consisting of hydroxy C_1–C_{20} alkyl, dihydroxy C_1–C_{20} alkyl, poly(oxyethylene) of the formula —$(CH_2CH_2O)_xH$, where x is an integer from 1 to 20 and poly(oxypropylene) of the formula —$(CH_2CH(CH_3)O)_yH$, where y is an integer from 1 to 50, containing a carboxy function with an acyl portion wherein the acyl portion of the carboxy function contains 1–20 carbons;
- j) cyclo C_3–C_8 alkyl;
- k) phenyl and substituted phenyl; and
- l) phenyl alkyl;

which comprises

- (1) adding dimethylsulfate to the tertiary amine under a blanket of an inert gas to form a reaction mixture wherein said addition is accomplished at a rate which allows said reaction mixture to attain a temperature which is at least 5 degrees C above the melting point and below a value at which thermal degradation takes place of a final quaternized form of the tertiary amine; and
- (2) maintaining said temperature until all of the dimethylsulfate is consumed.

5,463,095

PROCESS FOR THE PRODUCTION OF ESTERS

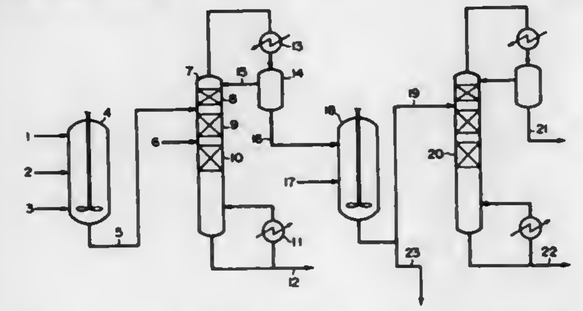
Yoshihiro Shiokawa; Tadayoshi Takefumi; Shunichi Matsumoto, and Yoshifumi Sato, all of Kurashiki, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Jun. 14, 1994, Ser. No. 260,237

Claims priority, application Japan, Jun. 15, 1993, 5-143679; Feb. 10, 1994, 6-016380; Feb. 28, 1994, 6-030243; Mar. 10, 1994, 6-040080; Mar. 25, 1994, 6-055787

Int. Cl.⁶ C07C *51/15*

U.S. Cl. 554—130 **11 Claims**



1. A process for the production of esters, which comprises the following steps:

a first step in which an olefin and carbon monoxide are reacted in the presence of hydrogen fluoride to synthesize an acyl fluoride and

a second step which allows the resultant acyl fluoride solution to react with an alcohol to form esters.

5,463,096

NICKEL/SILICA CATALYST AND THE PREPARATION AND USE THEREOF

Cornelis M. Lok, Didam, Netherlands, assignor to Unilever Patent Holdings B.V., Vlaardingen, Netherlands

Continuation of Ser. No. 833,050, Feb. 10, 1992, abandoned, which is a division of Ser. No. 524,262, May 16, 1990, Pat. No. 5,112,792. This application Jul. 6, 1994, Ser. No. 268,545

Claims priority, application European Pat. Off., May 16, 1989, 89201229

Int. Cl.⁶ C07C *51/36*

U.S. Cl. 554—146 **11 Claims**

1. A process for the hydrogenation of a fatty acid which comprises hydrogenating said fatty acid in the presence of a nickel/silica catalyst which optionally also contains cations of a lower Group II metal (X), characterized in that the reduced catalyst satisfies the following combination of features:

- (1) a molar ratio of $SiO_2/Ni=0.15–0.40$
- (2) a molar ratio of $X/Ni=0–0.15$
- (3) an active nickel surface area above 120 m^2/g nickel
- (4) A BET surface area which at least 55% is found with pores having a radius below 1.5 nanometers and wherein the activity of the catalyst is such that hydrogenation of standard undistilled soya bean fatty acids under standard conditions leads to an end iodine value below 5.

5,463,097

FERROCENYL DIPHOSPHINES AS LIGANDS FOR HOMOGENEOUS CATALYSTS

Antonio Togni, Oberwil-Lieli; Felix Spindler, Starrkirch-Wil; Nadia Zanetti, Zürich, all of, Switzerland, and Amina Tijani, Burnhaupt-le-Haut, France, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 37,783, Mar. 26, 1993, Pat. No. 5,371,256. This application Aug. 17, 1994, Ser. No. 292,150

Claims priority, application Switzerland, Apr. 2, 1992, 1068/92

Int. Cl.⁶ C07F *17/02;15/00*

U.S. Cl. 556—14 **21 Claims**

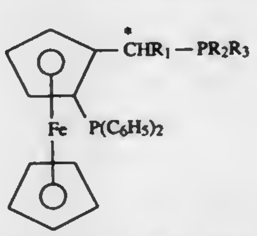
1. A complex of the formula V or VI,

$$[X_1M_1YZ] \quad (V),$$

$$[X_1M_1Y]^{\oplus}A_1^{\ominus} \quad (VI),$$

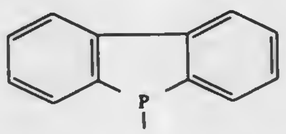
wherein X_1 is two C_2–C_{12}olefins or one C_5–C_{12}diene, Z is Cl, Br or I, $A_1^{\ominus}$ is the anion of an oxyacid or complex acid, M_1 is Rh or Ir, and Y is a compound of the formula I

(I)



wherein R_1 is C_1–C_8alkyl, phenyl or phenyl which is substituted by 1 to 3 C_1–C_4alkyl or C_1–C_4alkoxy groups; R_2 and R_3 are identical and are C_1–C_{12}alkyl, C_5–C_{12}cycloalkyl or C_1–C_4alkyl- or C_1–C_4alkoxy-substituted C_5–C_{12}cycloalkyl, or phenyl which is substituted by one to three identical or different members selected from the group consisting of C_1–C_4alkyl, C_1–C_4alkoxy, —$SiR_4R_5R_6$, halogen, —SO_3M, —CO_2M, —PO_3M, —NR_7R_8 and —$[^{\oplus}NR_7R_8R_9]X^{\ominus}$; or R_2 and R_3 are different and are C_1–C_{12}alkyl, C_5–C_{12}cycloalkyl, C_1–C_4alkyl- or C_1–C_4alkoxy-substituted C_5–C_{12}cycloalkyl, phenyl or phenyl which is substituted by one to three identical or different members selected from the group consisting of C_1–C_4alkyl, C_1–C_4alkoxy, —$SiR_4R_5R_6$, halogen, —SO_3M, —CO_2M, —PO_3M_2, —NR_7R_8 and —$[^{\oplus}NR_7R_8R_9]X^{\ominus}$; or the group —$PR_2R_3$ is a radical of the formula II

(II)



and R_4, R_5 R_6 are each independently of one another C_1–C_{12}alkyl or phenyl, R_7 and R_8 are H, C_1–C_{12}alkyl, phenyl or R_7 and R_8, taken together, are tetramethylene, pentamethylene or 3-oxa-1,5-pentylene, R_9 is H or C_1–C_4alkyl, M is H or an alkali metal, $X^{\ominus}$ is the anion of a monobasic acid, and * is a stereogenic carbon atom, in the form of the racemate or diastereoisomer or mixture of diastereoisomers.

5,463,098

CLEAR ANTIPERSPIRANT GEL STICK AND METHOD FOR MAKING SAME

Rocco Giovanniello, 8 Painted Apron Ter., Port Jervis, N.Y. 12771, and Nelson P. Ayala, 33 Euclid Ave., Middletown, N.Y. 10940

Continuation-in-part of Ser. No. 977,070, Nov. 16, 1992, abandoned. This application Aug. 20, 1993, Ser. No. 110,086

Int. Cl.^{6} A61K *7/32;7/36;7/38;* **C07F** *9/00*

U.S. Cl. 556—27 **32 Claims**

1. A process for preparing a diol soluble antiperspirant active useful in the preparation of a stable, clear, antiperspirant gel stick which comprises reacting an antiperspirant compound with a water soluble, normally liquid diol in a water solution by heating for about 1 to about 100 hours at a temperature of about 50° C. to about 110° C.; adding a zinc glycinate to the reaction mixture in an amount such that the ratio of total metal to zinc is about 8/1 to about 40/1, the mole ratio of glycine to zinc being about 2.4/1 to about 3.0/1, and removing the water to recover a powdered antiperspirant active.

5,463,099

EXTRACTANT FOR SELECTIVELY EXTRACTING STRONTIUM FROM AQUEOUS SOLUTION CONTAINING THE SAME

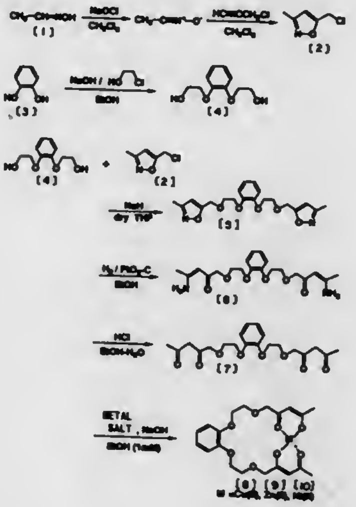
Yoshiaki Kobuke, Hamamatsu; Akio Togashi, Tsuchiura; Masaki Ozawa, and Masayuki Watanabe, both of Ibaraki, all of, Japan, assignors to Doryokuro Kakunenryo Kaihatsu Jigyodan, Tokyo, Japan

Filed Feb. 23, 1995, Ser. No. 392,511

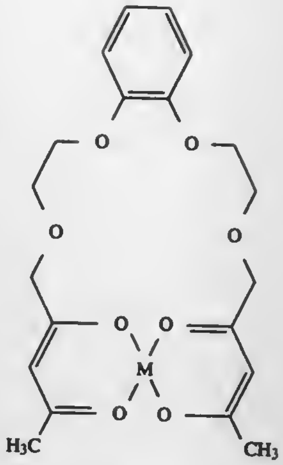
Claims priority, application Japan, Mar. 11, 1994, 6-040231

Int. Cl.^{6} C07F *1/08;3/06;15/04*

U.S. Cl. 556—117 **3 Claims**



1. A compound which is a 1,2-benzenebis(1,4-dioxanonyl-6,8-dionato)metal complex of the following structural formula:



wherein M represents a metal ion of Cu (II), Zn (II) or Ni (II).

5,463,100

PROCESS FOR THE PREPARATION OF AMINOARYL β-SULFATOETHYL SULFONE COMPOUNDS

Walter Rupp, Kriftel, Germany, assignor to Hoechst Aktiengesellschaft, Germany

Continuation of Ser. No. 827,561, Jan. 27, 1992, abandoned, which is a continuation of Ser. No. 499,392, Jun. 8, 1990, abandoned. This application Sep. 6, 1994, Ser. No. 301,311

Claims priority, application Germany, Dec. 11, 1987, 37 42 044.5; Jul. 1, 1988, 38 22 231.0

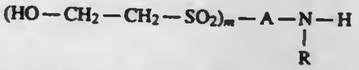
Int. Cl.^{6} C07C *305/18*

U.S. Cl. 558—29 **19 Claims**

1. A process for the preparation of a solid aminoaryl β-sulfatoethylsulfone compound in which an aminoaryl β-hydroxyethylsulfone starting compound is reacted with sulfuric acid in a sulfuric acid medium and the reaction mixture simultaneously dried which process is performed by

spraying a reaction mixture consisting essentially of:

an aminoaryl β-hydroxyethylsulfone starting compound of the formula (2)



$$(HO-CH_2-CH_2-SO_2)_m-A-\underset{\displaystyle R}{\underset{|}{N}}-H \qquad (2)$$

in which m denotes the number 1 or 2, A is a phenylene or napththalene radical, both of which radicals are unsubstituted or substituted by 1, 2, or 3 alkyl groups of 1 to 4 carbon atoms, alkoxy groups of 1 to 4 carbon atoms, halogen, carboxyl, or hydroxyl, and R stands for a hydrogen atom or the acyl residue of a lower alkanecarboxylic acid,

in 100% sulfuric acid or in an aqueous sulfuric acid having a water content of up to 90% by weight in a molar ratio of said starting compound to H_2SO_4 of about 1:1 to about 1:1.05,

into a hot gas stream having a temperature of 150° to 360° C. of a fluidized bed spray granulator, a spray dryer, or a spray dryer having an integrated fluid bed, and recovering the solid, dry particles of a half-ester of the formula (1)

$$(HO_3SO-CH_2-CH_2-SO_2)_m-A-NH_2 \qquad (1)$$

where A and m are as defined previously, from said spray granulator or spray dryer.

5,463,101

PROCESS OF MAKING LOW DIOXANE ALKOXYLATE PHOSPHATE ESTERS

Robert L. Reierson, Cranbury, N.J., assignor to Rhone-Poulenc Inc., Monmouth Junction, N.J.

Filed Dec. 1, 1994, Ser. No. 347,741

Int. Cl.⁶ C07F *9/09*

U.S. Cl. 558—110 **16 Claims**

1. A process for the production of low 1,4-dioxane, phosphoric acid esters comprising

A. reacting

a) at least one alcohol of the formula I

$$RO\{ C_nH_{2n}O\}_xH \qquad (I)$$

wherein R is selected from the group consisting of a saturated or unsaturated aliphatic C_1–C_{30} straight or branched carbon chain, a phenyl, a mono-, di-, or tri-substituted phenyl, a phenyl C_1–C_6 alkyl and a mono-, di-, or tri-substituted phenyl C_1–C_6 alkyl, wherein the phenyl substituent group(s) each have a total of 1 to 30 carbon atoms, and wherein each substitution may be a saturated or unsaturated straight or branched carbon chain, a phenyl, an alkyl phenyl, a phenyl alkyl, or an alkyl phenyl alkyl group; wherein n is from 2 to 4 and may be the same or different for each alkylene oxide unit; and wherein x is from 2 to 100; with

b) a slurry or paste reagent composition produced by intimately mixing an effective amount of phosphoric anhydride with from about 75 weight percent to about 117 weight percent phosphoric acid, said reagent composition having an effective equivalent polyphosphoric acid weight percent of from about 118 to 131;

B. Adding an effective amount of water to form a dioxane-water azeotrope; and

C. vacuum stripping said azeotrope above about 100 torr.

9. A process for the production of low 1,4-dioxane phosphoric acid esters comprising:

A. preparing a phosphoric acid-alcohol reactant solution by

i) dissolving

a) from about 75 weight percent to about 117 weight percent phosphoric acid in

b) at least one alcohol medium of the formula I

$$RO\{C_nH_{2n}O\}_xH \qquad (I)$$

wherein R is selected from the group consisting of a saturated or unsaturated aliphatic C_1–C_{30} straight or branched carbon chain, a phenyl, a mono-, di-, or tri-substituted phenyl, a phenyl C_1–C_6 alkyl and a mono-, di-, or tri-substituted phenyl C_1–C_6 alkyl, wherein the phenyl substituent group(s) each have a total of 1 to 30 carbon atoms, and wherein each substitution may be a saturated or unsaturated straight or branched carbon chain, a phenyl, an alkyl phenyl, a phenyl alkyl, or an alkyl phenyl alkyl group; wherein n is from 2 to 4 and may be the same or different for each alkylene oxide unit; and wherein x is from 2 to 100;

B.

i) intimately blending into said reactant solution and

ii) reacting the phosphoric acid in said reactant solution with a stoichiometrically effective amount of phosphoric anhydride to produce in-situ a phosphation reagent having an effective equivalent polyphosphoric acid weight percent of from about 118 to 131; and

C. reacting the phosphation reagent so produced with the alcohol medium at from about 75° C. to about 100° C. for a reaction time of from about 1 to about 12 hours:

D. adding an effective amount of water to form a dioxane-water azeotrope; and

E. vacuum stripping said azeotrope above about 100 torr.

5,463,102

PROCESS FOR THE CONTINUOUS PRODUCTION OF ARYL CARBONATES

Norbert Schön; Johann Rechner, both of Krefeld; Paul Wagner, Düsseldorf; Hans-Josef Buysch, Krefeld; Hans-Erich Gasche, Odenthal, and Ricarda Leiberich, Langen, all of, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Jan. 18, 1994, Ser. No. 182,867

Claims priority, application Germany, Jan. 25, 1993, 43 01 899.8

Int. Cl.⁶ C07C *69/96*

U.S. Cl. 558—274 **20 Claims**

1. A process for producing an aromatic carbonate of the formula

$$R^1—O—CO—O—R^2 \qquad (I)$$

in which

R^2 is phenyl or naphthyl and phenyl or naphthyl mono- to trisubstituted by straight-chain or branched C_1–C_4-alkyl, straight-chain or branched C_1–C_4-alkoxy, cyano and/or halogen, and

R^1 assumes, independently of R^2, the scope of meaning of R^2 or straight-chain or branched C_1–C_6-alkyl,

by catalyzed reaction of, in each case, 0.1–10 mol of an organic carbonate containing at least one aliphatic ester group of the formula

$$R^1—OCOO—R^3 \qquad (II)$$

in which

R^3 is straight-chain or branched C_1–C_6-alkyl and

R^1 has the above scope of meaning,

with 1 mol of a phenolic compound of the formula

$$R^2—OX \qquad (III)$$

in which

R^2 has the above scope of meaning and

X represents hydrogen or —CO—O—C_1–C_6-alkyl containing a straight-chain or branched alkyl group,

in the presence of a transesterification catalyst at 80°–350° C. and 10 mbar to 20 bar, wherein the reaction is carried out in at least two stirred containers connected one behind the other in such a way that the phenolic compound of the formula (III) is metered in liquid form into the first stirred container and the organic carbonate of the formula (II) is passed in gaseous form through said liquid phenolic compound in either cross current or counter current flow in one or more of the stirred containers and the reaction product of the formula (I) is removed in liquid form at the last stirred container and the product of the formula

$$R^3—OX \qquad (IV)$$

in which

R^3 and X have the specified meaning is removed at the head of one or more stirred containers.

5,463,103

PROCESS FOR PRODUCING 1,4-DICYANO-2-BUTENE

Shinji Nishii, Niihama; Shigeo Wake, Saijo, and Takeshi Ogawa, Niihama, all of, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Feb. 24, 1994, Ser. No. 210,412

Claims priority, application Japan, Feb. 26, 1993, 5-038313; Nov. 24, 1993, 5-293055

Int. Cl.⁶ C07C *253/10;253/16*

U.S. Cl. 558—341 **9 Claims**

1. A process for producing 1,4-dicyano-2-butene which comprises reacting a butene derivative represented by the formula [1]

$$R_1—CH_2—CH{=}CH—CH_2—R_2 \qquad [1]$$

or the formula [2]

$$R_3—CH_2—CHR_4—CH{=}CH_2 \qquad [2]$$

wherein R_1 and R_3 are the same or different and each represents a hydroxy group, a lower alkylcarbonyloxy group, a lower alkoxy group or a cyano group; and R_2 and R_4 are the same or different and each represents a hydroxy group, a lower alkylcarbonyloxy group or a lower alkoxy group, with hydrogen cyanide in the presence of a catalyst comprising a product prepared from a cuprous halide, a lower alkylamine, hydroxyalkylamine or alkylenediamine hydrohalide and at least one member selected from the group consisting of Lewis acids and basic acetates, carbonates or bicarbonates.

5,463,104

SUCCINOYLAMINO HYDROXYETHYLAMINO SULFONAMIDES USEFUL AS RETROVIRAL PROTEASE INHIBITORS

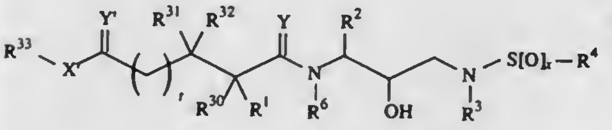
Michael L. Vazquez, Gurnee; Richard A. Mueller, Glencoe, both of Ill.; John J. Talley, St. Louis, Mo.; Daniel Getman, Chesterfield, Mo.; Gary A. DeCrescenzo, St. Peters, Mo., and John N. Freskos, Clayton, Mo., assignors to G. D. Searle & Co., Skokie, Ill.

Continuation-in-part of Ser. No. 935,490, Aug. 25, 1992, abandoned. This application Aug. 24, 1993, Ser. No. 110,912

Int. Cl.^{6} C07C *307/02;327/02*

U.S. Cl. 514—533 **21 Claims**

1. Compound represented by the formula:



or a pharmaceutically acceptable salt or ester thereof, wherein

x represents 0, 1 or 2;

t represents either 0 or 1;

X' represents —N(R^{34})— or —O—; or R^{33}—X'— represents cycloalkyl or aryl radicals; Y and Y' each independently represent O or S;

R^1, R^{30}, R^{31} and R^{32} each independently represent hydrogen, —OH, —$(CH_2)C(O)CH_3$, —$CH_2SO_2NH_2$, —CO_2CH_3, —$CONHCH_3$, —$CON(CH_3)_2$, —$CH_2C(O)NHCH_3$, —$CH_2C(O)N(CH_3)_2$, —$CONH_2$, —$C(CH_3)_2(SH)$, —$C(CH_3)_2(SCH_3)$, —$C(CH_3)_2(S(O)CH_3)$, —$C(CH_3)_2(S(O)_2CH_3)$, alkyl, haloalkyl, alkenyl, alkynyl, aralkyl or cycloalkyl radicals, or the side chain of the amino acid asparagine, S-methyl cysteine or the corresponding sulfoxide or sulfone derivatives thereof, leucine, isoleucine, alloisoleucine, tert-leucine, phenylalanine, ornithine, alanine, norleucine, glutamine, valine, threonine, serine, o-alkyl serine, aspartic acid, beta-cyano alanine or allothreonine; or R^{30} and R^{32} together with the carbon atoms to which they are attached form a cycloalkyl radical;

R^2 represents alkyl, aryl, cycloalkyl, cycloalkylalkyl or aralkyl radicals, which radicals are optionally substituted with halogen, alkyl, —NO_2, —CN, —CF_3, —OR^9 or —SR^9 radicals, wherein R^9 represents hydrogen or alkyl radicals;

R^3, R^{33} and R^{34} each independently represent hydrogen, alkyl, haloalkyl, alkenyl, alkynyl, hydroxyalkyl, alkoxyalkyl, cycloalkyl, cycloalkylalkyl, aryl, aralkyl or aminoalkyl radicals or N-mono- or N,N-disubstituted aminoalkyl radicals, wherein said substituents are alkyl, aryl, aralkyl, cycloalkyl or cycloalkylalkyl radicals;

R^4 represents alkyl, haloalkyl, alkenyl, alkynyl, hydroxyalkyl, alkoxyalkyl, cycloalkyl, cycloalkylalkyl, aryl, aralkyl or aminoalkyl radicals or N-mono- or N,N-disubstituted aminoalkyl radicals, wherein said substituents are alkyl, aryl, aralkyl, cycloalkyl or cycloalkylalkyl radicals; and

R^6 represents hydrogen or alkyl radicals; and

wherein alkyl, alone or in combination, means a straight-chain or branched-chain alkyl radical containing from 1 to 8 carbon atoms; alkenyl, alone or in combination, means a straight-chain or branched-chain hydrocarbon radial having one or more double bonds and containing from 2 to 8 carbon atoms; alkynyl, alone or in combination, means a straight-chain hydrocarbon radical having one or more triple bonds and containing from 2 to 10 carbon atoms; cycloalkyl, alone or in combination, means a saturated or partially saturated monocyclic, bicyclic or tricyclic alkyl radical wherein each cyclic moiety contains from 3 to 8 carbon atoms; and aryl, alone or in combination, means a phenyl or naphthyl radical which is optionally substituted with one or more alkyl, alkoxy, halogen, hydroxy, amino, acetylamino, nitro, cyano or haloalkyl radicals.

5,463,105

SUBSTITUTED BASIC 2-AMINOTETRALIN IN PHARMACEUTICALS

Rudolf Schohe, Wuppertal; Thomas Glaser, Röesrath; Jörg Traber, Lohmar, all of, Germany, and George S. Allen, Nashville, Tenn., assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

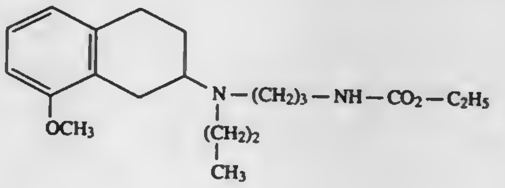
Division of Ser. No. 891,485, May 29, 1992, Pat. No. 5,298,513. This application Oct. 1, 1993, Ser. No. 131,267

Claims priority, application Germany, Dec. 10, 1986, 36 42 192.8; Jun. 1, 1987, 37 18 317.6

Int. Cl.^{6} C07C *271/08*

U.S. Cl. 560—29 **1 Claim**

1. The compound 2-[N-ethoxycarbonylamidopropyl)-N-propyl]amino-8-methoxy-1,2,3,4-tetrahydronaphthalene of the formula



or its hydrochloride salt.

5,463,106

PROCESS FOR THE ENANTIOSELECTIVE PREPARATION OF PHENYLISOSRINE DERIVATIVES

Arlene G. Correa, Grenoble; Jean-Noel Denis, and Andrew E. Greene, both of Uriage, all of, France, assignors to Centre National de la Recherche Scientifique, Paris, France

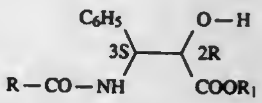
Division of Ser. No. 5,199, Jan. 15, 1993, Pat. No. 5,304,670, which is a continuation of Ser. No. 803,725, Dec. 9, 1991, abandoned, which is a continuation of Ser. No. 569,442, Aug. 20, 1990, abandoned. This application Mar. 9, 1994, Ser. No. 208,751

Claims priority, application France, Aug. 23, 1989, 89 11162; Jan. 2, 1989, 89 12825

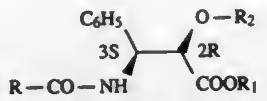
Int. Cl.^{6} C07C *227/04;229/34*

U.S. Cl. 560—39 **6 Claims**

1. Process for the enantioselective preparation of phenylisoserine of formula:



in which R represents a t-butoxy radical and R_1 represents an alkyl radical containing 1 to 4 carbon atoms comprising, reacting di-tertbutyl dicarbonate and hydrogen with a hydroxy azide of formula:



(I)

in which R_1 represents a C_1–C_4 alkyl radical, in the presence of an organic base and an activating agent, at a temperature of between 0° and 40° C., without isolation of the intermediate reaction products.

5,463,107

TRITERPENE DERIVATIVES AND ENDOTHELIN-RECEPTOR ANTAGONISTS CONTAINING THE SAME

Toshiro Konoike, Suita; Yoshitaka Araki, Higashiosaka; Tetsuyoshi Hayashi, Otsu; Kensuke Sakurai, Nara, and Takehiko Tozyo, Kobe, all of, Japan, assignors to Shionogi & Co., Ltd., Japan

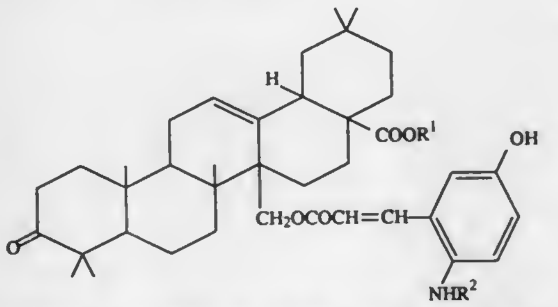
Filed Jun. 10, 1994, Ser. No. 258,392

Claims priority, application Japan, Jun. 11, 1993, 5-140416

Int. Cl.⁶ C07C *211/43*

U.S. Cl. 560—43 **6 Claims**

1. A compound of the formula (I)



(I)

wherein R^1 is hydrogen or metabolic ester residue; and R^2 is hydrogen or $—R^3—R^4$ wherein R^3 is $—SO_3—$, $—CH_2COO—$, $—COCOO—$, or $—COR^5COO—$ (R^5 is lower alkylene or lower alkenylene), and R^4 is hydrogen, lower alkyl or a pharmaceutically acceptable salt thereof.

5,463,108

PROCESS FOR PREPARING ACETOXYSTYRENE

James R. Sounik, Corpus Christi; William W. Wilkison, III, Richardson; Keith M. Russ, and Lynn Massarelli, both of Corpus Christi, all of Tex., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Filed Dec. 19, 1994, Ser. No. 359,098

Int. Cl.⁶ C07C *69/00*

U.S. Cl. 560—130 **14 Claims**

1. A process for preparing acetoxystyrene which comprises the step of acetylating 4-hydroxystyrene in the presence of an acetylating agent under suitable conditions of temperature and pressure and for a sufficient period of time to form said acetoxystyrene.

5,463,109

PROCESS FOR PREPARING CARBAMATES

Keigo Nishihira, and Shuji Tanaka, both of Ube, Japan, assignors to Ube Industries, Ltd., Yamaguchi, Japan

Continuation of Ser. No. 976,669, Nov. 16, 1992, abandoned, which is a continuation of Ser. No. 673,403, Mar. 22, 1991, abandoned. This application Jan. 27, 1995, Ser. No. 379,118

Claims priority, application Japan, Mar. 27, 1990, 2-75661

Int. Cl.⁶ C07C *269/00;269/04*

U.S. Cl. 560—157 **13 Claims**

1. A process for preparing a carbamate comprising reacting a carbonic acid diester selected from the group consisting of at least one of dimethyl carbonate diethyl carbonate, di-n-propyl carbonate, diisopropyl carbonate, di-n-butyl carbonate, diisobutyl carbonate, di-t-butyl carbonate, dihexyl carbonate, dicyclohexyl carbonate and dicyclododecyl carbonate with ammonia in the liquid phase in the presence of at least 1 mole % of water based on said carbonic acid diester and without a catalyst.

5,463,110

MICHAEL ADDUCTS OF N-VINYLFORMAMIDE AND ACRYLIC AND METHACRYLIC ESTERS

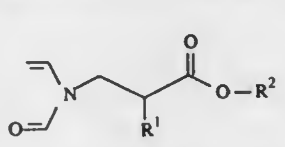
Ning Chen, Allentown; Walter L. Renz, Macungie, and Robert K. Pinschmidt, Jr., Allentown, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed May 20, 1994, Ser. No. 246,434

Int. Cl.⁶ C07C *229/06*

U.S. Cl. 560—172 **10 Claims**

1. An N-vinyl composition comprising a 3-(N-vinylformamido)propionate represented by the structural formula:



wherein R^1 is hydrogen or methyl, and R^2 is a linear or branched alkyl group containing from 1 to 8 carbon atoms.

5,463,111

PROCESS FOR PREPARING DIALKYL 2-HALOETHYL MALONATES

Klaus-Dieter Steffen, Hennef, Germany, assignor to Hüls Aktiengesellschaft, Marl, Germany

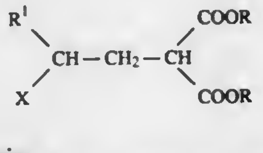
Filed Aug. 8, 1994, Ser. No. 287,157

Claims priority, application Germany, Aug. 11, 1993, 43 26 918.4

Int. Cl.⁶ C07C *69/38*

U.S. Cl. 560—192 **8 Claims**

1. The method of preparing a dialkyl 2-haloethyl malonate of the formula



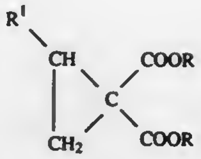
wherein

R is alkyl of 1 to 10 carbon atoms,

R^1 is hydrogen, methyl, ethyl or vinyl, and

X is chlorine, bromine or iodine,

which comprises reacting a dialkyl cyclopropane-1,1-dicarboxylate of the formula



wherein

R and R^1 have the meanings defined above, with an halogen halide of the formula

HX

wherein X has the meanings defined above, in the presence of a 1,2-dialkoxy ethane as a solvent and of a Friedel-Crafts catalyst.

5,463,112
PEROXYCOMPOUNDS
John P. Sankey; William Sanderson, both of Warrington, and Graham R. Horne, Rawenstall, all of, Great Britain, assignors to Solvay Interox Limited, Warrington, England

PCT No. PCT/GB91/00921, § 371 Date Feb. 2, 1993, § 102(e) Date Feb. 2, 1993, PCT Pub. No. WO91/18876, PCT Pub. Date Dec. 12, 1991

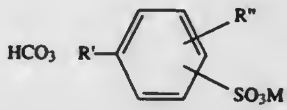
PCT Filed Jun. 7, 1991, Ser. No. 976,997

Claims priority, application United Kingdom, Jun. 8, 1990, 9012876

Int. Cl.^{6} C07C *409/08;409/42;* **C01B** *15/06*

U.S. Cl. 562—2 **21 Claims**

1. As novel compounds sulphoperoxyacids having the following formula (1):



in which R' bonds the percarboxylic acid substituent directly to the benzene nucleus or represents an alkylene group, R" represents at least one alkyl group and the total number of carbon atoms in R'+R" is from 4 to 18, R' and R" optionally forming a cycloalkyl group, and in which the —CO_3H and —SO_3M substituents are separated by at least 3 carbons linearly, and M represents an alkali metal.

5,463,113
PROCESS AND APPARATUS FOR PRODUCING TEREPHTHALIC ACID
Ryoichi Yamamoto; Fujimasa Nakao; Etsurou Okamoto, and Yasuhiko Yagi, all of Yamaguchi, Japan, assignors to Mitsui PetrochemicalIndustries, Ltd., Tokyo, Japan

Filed Mar. 2, 1994, Ser. No. 204,435

Claims priority, application Japan, Mar. 30, 1993, 5-072036

Int. Cl.^{6} C07C *51/16*

U.S. Cl. 562—414 **2 Claims**

1. A process for producing terephthalic acid by oxidizing paraxylene with a molecular oxygen-containing gas, comprising

supplying paraxylene and a molecular oxygen-containing as to an oxidizing reactor connected to a distillation column having at the lower part thereof a solid matter collecting tray and at the upper part thereof a packed bed, in order to cause oxidation of the paraxylene in a solvent based on acetic acid in the presence of a catalyst to form terephthalic acid,

introducing the oxidation exhaust gas into the distillation column and collecting finely dispersed solid matter by means of the solid matter collecting tray,

effecting distillation of substances contained in the oxidation exhaust gas through the packed bed, while removing heat and water out of the distillation column, and

recirculating the separated paraxylene and acetic acid to the oxidizing reactor.

5,463,114
PROCESS FOR THE PRODUCTION OF ETHER CARBOXYLIC ACIDS AND SALTS THEREOF
Wolf-Eckart Noack, Essen; Paul Schulz, Wuppertal, both of, Germany, and F. Norman Tuller, Simpsonville, S.C., assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Germany

Filed Apr. 13, 1994, Ser. No. 226,903

Int. Cl.^{6} C07C *51/235*

U.S. Cl. 562—421 **17 Claims**

1. A process for making an ether carboxylic acid salt corresponding to formula (I):

$$R—(OC_mH_{2m})_{n—O—CH2}COOM \qquad (I)$$

wherein R is an alkyl group having from 1 to 22 carbon atoms, an aryl group or an aralkyl group; n is 2 or 3; n is a number from 1 to 200; M is an alkali metal; which comprises the steps of: (1) providing a mixture comprised of water and a noble metal catalyst; evacuating to a pressure above said mixture of from about 0.01 to about 0. 1 bar; (2) heating said mixture to a temperature of from about 50 ° C. to about 130° C.; (3) simultaneously adding to said mixture the following: (a) an ether alcohol of the formula (II)

$$R—(OC_mH_{2m})_n—O—CH_2CH_2OH \qquad (II)$$

wherein R, m, and n are defined as above at a rate sufficient to maintain the quantity of unreacted ether alcohol at from about 0. 1% to about 15% by weight; (b) an aqueous alkali metal hydroxide solution at a rate sufficient to maintain the pH at a value of at least 8; (c) oxygen at a rate sufficient to maintain the partial oxygen pressure in the range of from about 0.1 bar to about 0.6 bar; wherein the ether alcohol of formula II is not present in the mixture in step (1).

5,463,115
SULFONIMINES AS BLEACH CATALYSTS
David J. Batal, Secaucus, N.J., and Stephen A. Madison, Valley Cottage, N.Y., assignors to Lever Brothers Company, Division of Conopco, Inc., New York, N.Y.

Division of Ser. No. 494,713, Mar. 16, 1990, Pat. No. 5,041,232. This application Jul. 16, 1991, Ser. No. 731,839

Int. Cl.^{6} C07C *317/14*

U.S. Cl. 562—430 **12 Claims**

1. A compound whose structure is:

$$R^1R^2C{=}NSO_2R^3$$

wherein:

R^1 may be a substituted or unsubstituted radical selected from the group consisting of hydrogen, phenyl, aryl, alkyl and cycloalkyl radicals;

R^2 may be a substituted or unsubstituted radical selected from the group consisting of hydrogen, phenyl, aryl, alkyl, cycloalkyl $R^1C{=}NSO_2R^3$ nitro, halo, cyano, alkoxy, keto, carboxylic and carboalkoxy radicals;

R^3 may be a substituted or unsubstituted radical selected from the group consisting of phenyl, aryl, alkyl, cycloalkyl, nitro, halo, and cyano radicals;

R^1 with R^2 and R^2 with R^3 may respectively together form a cycloalkyl and aromatic ring system; and

wherein at least one of R^1, R^2, R^3 contains a water-solubilizing functional unit selected from the group consisting of carboxylic acid, phosphoric acid, phosphonic acid, sulfuric acid, sulfonic acid, C_1–C_{40}, quaternary di- or tri-alkyl ammonium radicals and salts thereof and said substitution of R^1, R^2, R^3, is a functional unit selected from the group consisting of nitro, halo, cyano, C_1–C_{20} alkyl, amino, aminoalkyl, thioalkyl, sulfoxyalkyl, carboxyester, hydroxy, C_1–C_{20} alkoxy, polyalkoxy, C_1–C_{40} quaternary di- or tri-alkyl ammonium radicals and mixtures thereof.

5,463,116

CRYSTALS OF N- (TRANS-4-ISOPROPYLCYCLOHEXLYCARBONYL)-D-PHENYLALANINE AND METHODS FOR PREPARING THEM

Michito Sumikawa; Yoshihito Koguchi; Takao Ohgane; Yasuo Irie, all of Kawasaki, and Satoji Takahashi, Yottukaichi, all of, Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Continuation-in-part of Ser. No. 166,144, Dec. 14, 1993, which is a continuation of Ser. No. 921,224, Jul. 29, 1992, abandoned. This application Feb. 2, 1994, Ser. No. 190,460

Claims priority, application Japan, Jul. 30, 1991, 3-189696; Aug. 8, 1991, 3-199453

Int. Cl.⁶ C07C *229/00*

U.S. Cl. 562—450 **19 Claims**

1. Crystals of N-(trans-4-isopropylcyclohexylcarbonyl)-D-phenylalanine having at least one of the following properties:

(a) a melting point in the range of 136°–142° C.

(b) a powder X-ray diffraction pattern with reflection maxima at 2θ of about 8.1°, 13.1°, 19.6° and 19.9°;

(c) an infra red absorption spectrum with absorption bands in the region of 1714, 1649, 1542 and 1214 cm^{-1}.

5,463,117

PROCESS FOR THE PREPARATION OF SALTS OF 2-(4-ISOBUTYLPHENYL)PROPIONIC ACID

Federico Stroppolo, Pregassona, Switzerland; Daniele Bonadeo, Varese, and Annibale Gazzaniga, Rescaldina, both of, Italy, assignors to Zambon Group S.p.A., Vicenza, Italy

Filed Jul. 29, 1994, Ser. No. 281,670

Claims priority, application Italy, Jul. 30, 1993, MI93A1721

Int. Cl.⁶ C07C *53/134*

U.S. Cl. 562—496 **10 Claims**

1. A process for the preparation of salts of 2-(4-isobutylphenyl)propionic acid with a basic aminoacid, comprising the steps of:

melting said 2-(4-isobutylphenyl)propionic acid;

adding boiling water and an equimolar amount, based on said 2-(4-isobutylphenyl)propionic acid, of a basic aminoacid to the melted 2-(4 -isobutylphenyl)propionic acid to form a salt; and,

removing the water to isolate said salt.

5,463,118

N-(L-ASPARTYL)AMINO ALCOHOL DERIVATIVE AND SWEETENER CONTAINING THE SAME

Yoshifumi Yuasa; Yoshiki Okeda; Akio Tachikawa; Akira Nagakura, and Haruki Tsuruta, all of Tokyo, Japan, assignors to Takasago International Corporation, Tokyo, Japan

Continuation of Ser. No. 578, Jan. 4, 1993, abandoned, which is a continuation of Ser. No. 784,074, Oct. 30, 1991, abandoned, which is a continuation of Ser. No. 453,216, Dec. 21, 1989, abandoned, which is a continuation of Ser. No. 250,585, Sep. 29, 1988, abandoned. This application Jun. 2, 1994, Ser. No. 254,442

Claims priority, application Japan, Sep. 29, 1987, 62-242573; Apr. 21, 1988, 63-96859; Jun. 28, 1988, 63-158034

Int. Cl.⁶ C07C *61/12;* **A23L** *1/236*

U.S. Cl. 562—502 **2 Claims**

1. A single isomer (2R,3R)-3-N-(L-aspartyl)amino- 1-2-butanol.

5,463,119

RECYCLING PROCESS FOR THE PRODUCTION OF ADIPIC ACID AND OTHER ALIPHATIC DIBASIC ACIDS

John Kollar, c/o Miles Inc., Mobay Rd., Pittsburgh, Pa. 15205

Continuation of Ser. No. 53,788, Apr. 26, 1993, abandoned, which is a continuation-in-part of Ser. No. 951,636, Sep. 25, 1992, abandoned. This application Feb. 28, 1994, Ser. No. 203,453

Int. Cl.⁶ C07C *51/31*

U.S. Cl. 562—543 **22 Claims**

1. A process for the oxidative preparation of adipic acid comprising

(1) reacting

(a) cyclohexane in the liquid phase and

(b) an excess, relative to cyclohexane, of oxygen gas or an oxygen-containing gas mixture

in the presence of

(c) 0.15 to 15 moles of a solvent per mole of cyclohexane, wherein said solvent comprises an organic acid containing only primary and/or secondary hydrogen atoms and

(d) at least 0.002 mole per 1000 grams of reaction mixture of a polyvalent heavy metal catalyst,

wherein the conversion of cyclohexane is no more than about 75%;

(2) removing the adipic acid by

(i) cooling the reaction mixture to induce precipitation of the adipic acid and separation of the liquid portion of the reaction mixture into a polar liquid phase and a non-polar liquid phase, and

(ii) separating the resultant precipitated adipic acid, polar liquid phase, and non-polar liquid phase from one another; and

(3) recycling intermediates, post-oxidation components, and derivatives thereof remaining after removal of the adipic acid by

(i) transferring the non-polar liquid phase into reaction step (1) for reaction with oxygen gas or an oxygen-containing gas mixture in the presence of solvent (c) and catalyst (d) and subsequent isolation of the adipic acid, and

(ii) transferring 10 to 98% by weight of the polar liquid phase into reaction step (1) for reaction with oxygen gas or an oxygen-containing gas mixture in the presence of solvent (c) and catalyst (d) and subsequent isolation of the adipic acid.

5,463,120

METHOD FOR THE CRYSTALLIZATION OF METHIONINE

Jean Giraud, Salindres, and Daniel LeClaire, Durdat Larequille, both of, France, assignors to Rhone-Poulenc Nutrition Animale, Antony, France

Filed Jul. 22, 1994, Ser. No. 279,164

Claims priority, application France, Jul. 28, 1993, 93 09273

Int. Cl.^{6} C07C *321/00*

U.S. Cl. 562—559 **18 Claims**

1. A process for the crystallization of DL-methionine comprising the step of crystallizing DL-methionine from a crystallization medium comprising DL-methionine and a water soluble aluminium salt of an organic acid to form crystals of DL-methionine.

5,463,121

PROCESS FOR THE REMOVAL OF WATER FROM ACRYLIC ACID

Srinivasan Sridhar, Marl, Germany, assignor to Huels Aktiengesellschaft, Marl, Germany

Filed Oct. 6, 1994, Ser. No. 319,017

Claims priority, application Germany, Jan. 19, 1994, 44 01 405.8

Int. Cl.^{6} C07C *51/42*

U.S. Cl. 562—600 **15 Claims**

1. A process for removing water from an aqueous acrylic acid solution, comprising:

removing 10 to 90 weight % of water from said solution by membrane pervaporation, wherein the membrane is formed of polyvinyl alcohol, polyimide, polysulfone, polyphenylene oxide, polyvinyl carbonate, vinyl alcohol/vinyl acetate copolymer, acrylic acid/acrylonitrile copolymer, vinylpyridine/acrylonitrile copolymer or vinyl acetate/vinylpyrrolidone copolymer.

5,463,122

ARYLTHIO COMPOUNDS

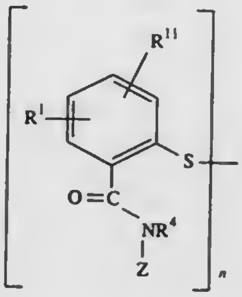
Edward F. Elslager, Ann Arbor, and Rocco D. Gogliotti, Pinckney, both of Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Aug. 5, 1994, Ser. No. 286,816

Int. Cl.^{6} C07C *311/16;* **A61K** *31/18*

U.S. Cl. 564—82 **9 Claims**

1. A compound of the formula



(I)

wherein:

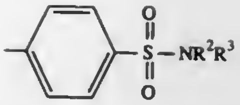
n is 1 or 2;

Y is hydrogen when n is 1, and is a single bond when n is 2;

R^1 and R^{11} independently are hydrogen, halo, C_1–C_6 alkyl, hydroxy, C_1–C_6 alkoxy, carboxy, C_1–C_6 alkoxycarbonyl, nitro, or NR^2R^3, where R^2 is hydrogen or C_1–C_6 alkyl and R^3 is hydrogen, C_1–C_6 alkyl or C_1–C_6 alkanoyl;

R^4 is hydrogen or C_1–C_6 alkyl;

Z is



where R^2 and R^3 are as defined above;

and pharmaceutically acceptable salts and solvates thereof.

5,463,123

PROCESS FOR PRODUCING α-HYDROXYISOBUTYRAMIDE

Takako Uchiyama, and Hirofumi Higuchi, both of Niigata, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Oct. 12, 1993, Ser. No. 135,062

Claims priority, application Japan, Nov. 9, 1992, 4-298781

Int. Cl.^{6} C07C *231/06*

U.S. Cl. 564—126 **22 Claims**

1. A process for producing α-hydroxyisobutyramide comprising:

(a) treating a manganese dioxide-containing catalyst with a reducing liquid to weaken the oxidation capability of said catalyst, while preserving the hydration capacity of said catalyst; and then

(b) carrying out a hydration reaction with a reaction mixture of acetone cyanohydrin in the presence of said catalyst from step (a) in a continuous flow reaction method with a fixed bed of said catalyst.

5,463,124

PROCESS FOR THE DIASTEREOSELECTIVE REDUCTIVE PINACOL COUPLING OF HOMOCHIRAL α-AMINOALDEHYDES

Detlef Jacobi, Ostfildern; Heiner Jendralla, and Bernhard Kammermeier, both of Frankfurt am Main, all of, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Continuation of Ser. No. 956,238, Oct. 5, 1992, abandoned.

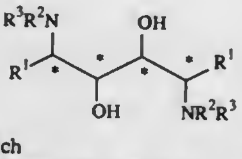
This application Jun. 22, 1994, Ser. No. 264,842

Claims priority, application Germany, Jan. 7, 1991, 41 33 202.4

Int. Cl.^{6} C07C *237/20;235/32*

U.S. Cl. 564—155 **8 Claims**

1. A process for the preparation of compounds of the formula I



(I)

in which

R^1 is a side-chain radical of a natural or unnatural α-amino acid;

R^2 and R^3 are identical or different and are

a) - hydrogen

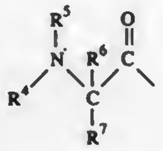
b) - a radical of the formula

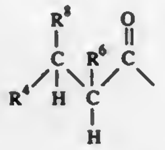
$$D-(E)_n-(F)_o-(G)_p \qquad (II)$$

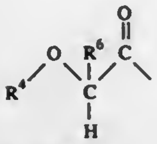
where E, F and G independently of one another are a natural or unnatural amino acid, aza amino acid or imino acid;

n, o and p independently of one another are 0 or 1;

D is R^4 or a radical of the formula III, IV or V


(III)


(IV)


(V)

in which R^4 is

b_1) - hydrogen,
- carboxyl,
- (C_1-C_{18})-alkyl which is optionally monounsaturated or diunsaturated and which is optionally substituted by up to 3 identical or different radicals selected from the group comprising
  - mercapto,
  - hydroxyl,
  - (C_1-C_7)-alkoxy,
  - carbamoyl,
  - (C_1-C_7)-alkanoyloxy,
  - carboxyl,
  - (C_1-C_7)-alkoxycarbonyl,
  - F, Cl, Br or I,
  - amino,
  - amidino which can optionally be substituted by one, two or three (C_1-C_8)-alkyl radicals,
  - guanidino which can optionally be substituted by one or two benzyloxycarbonyl radicals or by one, two, three or four (C_1-C_8)-alkyl radicals,
  - (C_1-C_7)-alkylamino,
  - di-(C_1-C_7)-alkylamino,
  - (C_1-C_6)-alkoxycarbonylamino,
  - (C_7-C_{15}) -aralkoxycarbonyl,
  - (C_7-C_{15}) -aralkoxycarbonylamino,
  - phenyl- (C_1-C_4) -alkoxy,
  - 9-fluorenylmethoxycarbonylamino,
  - (C_1-C_6)-alkylsulfonyl,
  - (C_1-C_6)-alkylsulfinyl,
  - (C_1-C_6)-alkylthio,
  - hydroxamino,
  - hydroximino,
  - sulfamoyl,
  - sulfo,
  - carboxamido,
  - formyl,
  - hydrazono,
  - imino,
  - a radical $CONR^9R^{10}$,
  - by up to six hydroxyl or
  - by up to five (C_1-C_8)-alkanoyloxy;
- mono-, bi- or tricyclic (C_3-C_{18})-cycloalkyl,
- (C_3-C_{18})-cycloalkyl-(C_1-C_6)-alkyl, where the cycloalkyl moiety is in each case optionally substituted by one or two identical or different radicals selected from the group comprising
  - F, Cl, Br or I,
  - carboxyl,
  - carbamoyl,
  - carboxymethoxy,
  - hydroxyl,
  - (C_1-C_7)-alkoxy,
  - (C_1-C_7)-alkyl,
  - (C_1-C_7)-alkoxycarbonyl,
  - amino,
  - (C_1-C_6)-alkylamino-(C_1-C_6)-alkyl,
  - di- (C_1-C_6)-alkylamino-(C_1-C_6)-alkyl,
  - amidino,
  - hydroxamino,
  - hydroximino,
  - hydrazono,
  - imino,
  - guanidino,
  - (C_1-C_6)-alkoxysulfonyl,
  - (C_1-C_6)-alkoxysulfinyl,
  - (C_1-C_6)-alkoxycarbonylamino,
  - (C_6-C_{12})-aryl-(C_1-C_4)-alkoxycarbonylamino,
  - (C_1-C_7)-alkylamino,
  - di- (C_1-C_7)-alkylamino and
  - trifluoromethyl;
- (C_6-C_{14})-aryl,
- (C_6-C_{14})-aryl-(C_1-C_6)-alkyl,
- (C_6-C_{14})-aryloxy-(C_1-C_6)-alkyl or
- (C_6-C_{14})-aryl-(C_3-C_8)-cycloalkyl, in which the aryl moiety is in each case optionally substituted by one, two or three identical or different radicals selected from the group comprising
  - F, Cl, Br or I,
  - hydroxyl,
  - mono, di- or trihydroxy-(C_1-C_4)-alkyl,
  - trifluoromethyl,
  - formyl,
  - carboxamido,
  - mono- or di- (C_1-C_4)-alkylaminocarbonyl,
  - nitro,
  - (C_1-C_7)-alkoxy,
  - (C_1-C_7)-alkyl,
  - (C_1-C_7)-alkoxycarbonyl,
  - amino,
  - (C_1-C_7)-akylamino,
  - di- (C_1-C_7)-alkylamino,
  - carboxyl,
  - carboxymethoxy,
  - amino- (C_1-C_7)-alkyl,
  - (C_1-C_7)-alkylamino-(C_1-C_7)-alkyl,
  - di- (C_1-C_7)-alkylamino-(C_1-C_7)-alkyl,
  - (C_1-C_7)-alkoxycarbonylmethoxy,
  - carbamoyl,
  - sulfamoyl,
  - (C_1-C_7)-alkoxysulfonyl,
  - (C_1-C_8)-alkylsulfonyl,
  - sulfo-(C_1-C_8)-alkyl,
  - guanidino-(C_1-C_8) -alkyl and
  - (C_1-C_6)-alkoxycarbonylamino;
- het,
- het-(C_1-C_6)-alkyl,
- het-(C_3-C_8)-cycloalkyl,
- het-(C_3-C_8)-cycloalkyl-(C_1-C_4)-alkyl,
- het-(C_3-C_8)-cycloalkoxy-(C_1-C_4)-alkyl,
- het-thio-(C_1-C_6)-alkyl,
- het-thio-(C_3-C_8)-cycloalkyl,
- het-thio-(C_3-C_8)-cycloalkyl-(C_1-C_4)-alkyl, where het in each case is the radical of a 5- to 7-membered monocyclic or 8- to 10-membered bicyclic ring system which can be benzo-fused, aromatic, partly or completely hydrogenated, which as hetero elements can contain one, two, three or four different radicals from the group comprising N, O, S, NO, SO and SO_2, which can be substituted by 1 to 6 hydroxyl and which is optionally defined as in the case of (C_6-C_{14})-aryl in b_1) and/or is mono-, di- or trisubstituted by oxo, or is a radical NR^9R^{10}, or

b_2) - a radical of the formula VI

R^{4a}- W (VI)

in which R^{4a} is defined as R^4 in b_1) and W is —CO—, —CS—, —O—CO—, —SO_2—, —SO—, —S—, —$NHSO_2$—,

—NHCO—, —CH(OH)—, —N(OH)— or —CO-V—, where V is a peptide having altogether 1 to 10 amino-, imino- and/or aza amino acids;

or in which R^4 together with R^8 and the atoms carrying them, form monocyclic or bicyclic, saturated or partially unsaturated ring systems having 5–12 ring members, which, apart from carbon, can also contain 1 sulfur atom which can optionally be oxidized to the sulfoxide or sulfone;

b_3) - a glycosyl radical, preferably a glucofuranosyl or glucopyranosyl radical which is derived from naturally occurring aldotetroses, aldopentoses, aldohexoses, ketopentoses, ketohexoses, deoxyaldoses, aminoaldoses and oligosaccharides and their stereoisomers; or

b_4) - an amino protective group;

R^5 is - hydrogen or
- (C_1–C_8)-alkyl, or
- together with R^6 and the atoms carrying this radical forms mono- or bicyclic, saturated or partially unsaturated ring system having 5–12 ring members;

R^6 is - defined as R^4 in b_1);
- hydroxyl or (C_1–C_4)-alkanoyloxy; or
- together with R^7 and the atoms carrying this radical, forms a saturated or partially saturated ring system having 3 to 12 ring members; or
- together with R^8 and the atoms carrying this, forms a mono- or bicyclic, saturated or partially saturated ring system having 5–12 ring members which, apart from carbon, can also contain one sulfur atom which can optionally be oxidized to the sulfoxide or sulfone; or can contain one nitrogen atom, where the ring system can optionally be substituted by amino;

R^7 is - hydrogen or
- (C_1–C_6)-alkyl;

R^8 is - hydrogen
- hydroxyl,
- (C_1–C_4)-alkanoyloxy or
- (C_1–C_8)-alkyl;

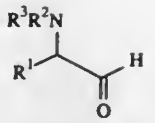
R^9 and R^{10} are
- hydrogen,
- (C_1–C_8)-alkyl which can be substituted by
- amino,
- (C_1–C_4)-alkylamino,
- di-(C_1–C_4)-alkylamino,
- mercapto,
- carboxyl,
- hydroxyl or
- (C_1–C_4)-alkoxy,
- (C_3–C_7)-cycloalkyl,
- (C_1–C_4)-alkoxycarbonyl,
- (C_6–C_{14})-aryl, (C_6–C_{14})-aryl-(C_1–C_4)-alkoxycarbonyl which can be substituted in the aryl moiety as described in the case of R^4,
- het or
- het-(C_1–C_4)-alkyl, where het is defined as described in the case of R^4,

or where

R^9 and R^{10}, together with the nitrogen atom carrying them, form monocyclic or bicyclic, saturated, partially unsaturated or aromatic ring systems which as ring members in addition to carbon also contain 1 or additionally 2 nitrogen atoms, 1 sulfur atom or 1 oxygen atom and can be substituted by (C_1–C_4)-alkyl, where in the above compounds of the formula I one or more amide groups (—CONH—) of the main chain can be replaced by —CH_2NR^{11}, —CH_2S—, —CH_2O—, —OCH_2—, —CH_2CH_2—, —CH=CH—(cis and trans), —$COCH_2$—, —CH(OH)CH_2—, —CH_2SO—, —CH_2SO_2—, —COO—, —P(O)(OR^{12})CH_2— and —P(O)(OR^{12})NH—, or alternatively by an amide group of reverse polarity (—NHCO—);

in which R^{11} and R^2 independently of one another are
- hydrogen or
- (C_1–C_4)-alkyl;

and their enantiomers and physiologically acceptable salts, which comprises treating homochiral α-aminoaldehydes of the formula VII



(VII)

in which R^1 R^2 and R^3 are defined as above, with the $NbCl_3$-dimethoxyethane complex [$NbCl_3$ (DME)], and simultaneously controlling over all four centers of chirality.

5,463,125

PHENYL ALCOHOL AMIDES HAVING ANTICONVULSANT ACTIVITY

Guillermo C. Sandoval, Cocoteros 177, Col. Neuva Santa Maria, 02800, Mexico City, Mexico; Sergio E. M. Toledo, Cerro del Fortin 110-5, Col. Campestre Churubusco, 04400-Mexico City, Mexico, and Martha T. Z. Garcia, Orquidea 94, Col. Loma Linda, 52900 Naucalpan, Edo de Mexico, Mexico

Continuation of Ser. No. 756,329, Sep. 6, 1991, abandoned. This application Jun. 3, 1993, Ser. No. 72,228

Int. Cl.^{6} C07C *233/05*

U.S. Cl. 564—170 **1 Claim**

1. (±)-3-hydroxy-3-phenylpentamide.

5,463,126

PROCESS FOR PREPARING SERTRALINE

Michael T. Williams, Sandwich, United Kingdom, assignor to Pfizer Inc., New York, N.Y.

PCT No. PCT/EP92/01497, § 371 Date Jan. 10, 1994, § 102(e) Date Jan. 10, 1994, PCT Pub. No. WO93/01162, PCT Pub. Date Jan. 21, 1993

PCT Filed Jul. 3, 1992, Ser. No. 178,272

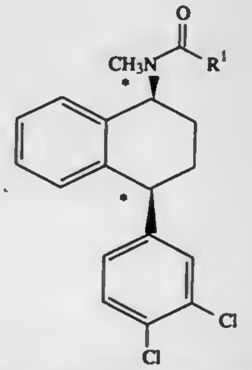
Claims priority, application United Kingdom, Jul. 11, 1991, 9114947

Int. Cl.^{6} C07C *233/03;233/04;231/18*

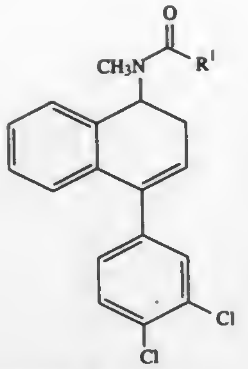
U.S. Cl. 564—222 **16 Claims**

1. A process for the preparation of the substantially geometrically pure cis-stereoisomeric form of a compound of the formula:

(I)



wherein R^1 is H or C_1–C_4 alkyl and * denotes an unresolved asymmetric centre, which comprises catalytic hydrogenation of a compound of the formula:



(III)

wherein R^1 is as defined for formula (I) .

5,463,127
PROCESS FOR PREPARATION OF HALOHYDROXYPROPYL-TRIALKYLAMMONIUM HALIDES

Joseph L. Deavenport, Richwood, and Bladimir I. Lopez, Sweeny, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 17, 1995, Ser. No. 373,141

Int. Cl.^{6} C07C *209/02*

U.S. Cl. 564—292 **10 Claims**

1. A process for producing halohydroxypropyltrialkylammonium salts by reacting, in a reaction mixture, a trialkylamine hydrohalide salt and the corresponding free amine with an epihalohydrin, wherein the free trialkylamine is present in an amount corresponding to from about 1 to about 10 mole percent of the combination of free amine and amine hydrohalide and wherein the epihalohydrin is admixed and allowed to react for a first period of time with the free amine and hydrohalide salt at a first temperature less than a second temperature at which the epihalohydrin is allowed to further react with the amine and hydrohalide salt for a second period of time wherein the second temperature is sufficiently greater than the first that less unreacted amine is present after reaction than is present if the same reactants are admixed and reacted at the first temperature for a time equal to the sum of the first and second periods of time.

5,463,128
1,4-BIS(4,4-DIPHENYL-1,3-BUTADIENYL)BENZENE DERIVATIVE AND ELECTROPHOTOGRAPHIC PHOTORECEPTOR USING THE SAME

Yoshimasa Matsushima, and Toshimitsu Hagiwara, both of Kanagawa, Japan, assignors to Takasago International Corporation, Tokyo, Japan

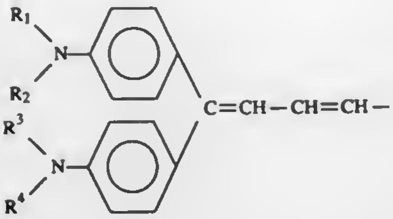
Filed Apr. 28, 1994, Ser. No. 233,434

Claims priority, application Japan, Apr. 28, 1993, 5-123105

Int. Cl.^{6} C07C *211/43;211/54*

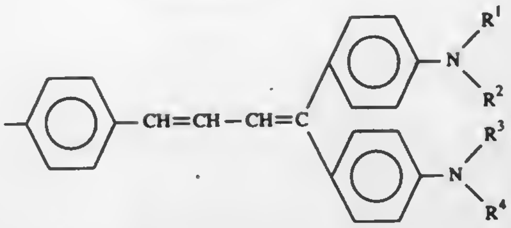
U.S. Cl. 564—452 **2 Claims**

1. A 1,4-bis(4,4-diphenyl-1,3-butadienyl)benzene derivative represented by formula (I):



(I)

-continued



wherein R^1, R^2, R^3, and R^4 each independently represents a lower alkyl group which may be substituted with a lower alkoxV group or a halogen atom, an aralkyl group which may be substituted with a lower alkyl group, a lower alkoxy group or a halogen atom, or an aryl group which may be substituted with a lower alkyl group, a lower alkoxy group or a halogen atom.

5,463,129
CLEAVING ARYLETHERS

Zenon Lysenko, and Richard G. Pews, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

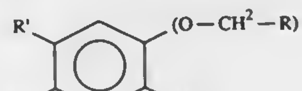
Filed Dec. 23, 1993, Ser. No. 173,451

Int. Cl.^{6} C07C *211/50*

U.S. Cl. 564—423 **18 Claims**

15. A method for preparing 4,6-diaminoresorcinol comprising the steps of:

A) contacting a compound of the formula:



wherein R is hydrogen, C_1–C_6 alkyl, cycloalkyl, phenyl or substituted phenyl or $CH{=}CH_2$; and R' is selected from hydroxy, methoxy or —O—CH_2—R; with an amide hydrohalide salt to form a phenol or substituted phenol; and

B) hydrogenating the phenol or substituted phenol to form 4,6-diaminoresorcinol.

5,463,130
PREPARATION OF PERALKYLATED AMINES

Tom Witzel, Ludwigshafen; Eberhard Fuchs, Frankenthal, and Horst Zimmermann, Mannheim, all of, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

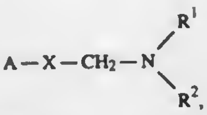
Filed Feb. 28, 1995, Ser. No. 395,596

Claims priority, application Germany, Mar. 7, 1994, 44 07 466.2

Int. Cl.^{6} C07C *209/48*

U.S. Cl. 564—490 **9 Claims**

1. A process for the preparation of a peralkylated amine of the general formula I



$$A-X-CH_2-N\begin{matrix}R^1\\R^2,\end{matrix} \qquad (I)$$

in which

R^1, R^2 denote C_1–C_{200}alkyl, C_3–C_8cycloalkyl, C_4–C_{20}alkylcycloalkyl, C_4–C_{20} cycloalkylalkyl, C_2–C_{20}alkoxyalkyl, aryl, C_7–C_{20}alkylaryl, C_7–C_{20}aralkyl, C_2–C_8hydroxyalkyl, C_2–C_8mercaptoalkyl, C_8–C_{20}phenoxyalkyl, C_2–C_8 aminoalkyl, C_2–C_8(NHR^4)alkyl, C_2–C_8(NR^4R^5)alkyl or together form a saturated or unsaturated C_2–C_6alkylene chain optionally mono- to tri-substituted by C_1–C_4alkyl and optionally interrupted by oxygen or nitrogen

X denotes a C_2–C_{20}alkylene or C_2–C_{20}alkenylene or C_4–C_8cycloalkylene chain optionally mono- to penta-substituted by R^3, C_1–C_8alkyl, C_1–C_8 alkoxy, C_1–C_8dialkylamino, phenoxy, diphenylamino and/or C_2–C_8 alkoxycarbonyl,

A denotes hydrogen, C_1–C_{20}alkyl, C_3–C_8cycloalkyl, C_4–C_{20}alkylcycloalkyl, C_4–C_{20}cycloalkylalkyl, C_2–C_{20}alkoxyalkyl, aryl, C_7–C_{20}alkylaryl, C_7–C_{20} aralkyl, C_1–C_{20}alkoxy, hydroxy, C_1–C_{20}hydroxyalkyl, amino, C_1–C_{20}alkylamino, C_2–C_{20}dialkylamino, C_3–C_{12}alkenyleneamino, C_3–C_8cycloalkylamino, arylamino, aryl-C_1–C_8alkylamino, halogen, mercapto, C_2–C_{20} alkenyleneoxy, C_3–C_8cycloalkoxy and aryloxy

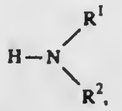
R^3 denotes CH_2—NR^1R^2,

R^4, R^5 denote C_1–C_{20}alkyl

by the reaction of a nitrile of the general formula II

$$A—X—CN \qquad (II),$$

in which R^1, R^2, R^4, R^5, X and A have the aforementioned meanings and R^3 stands for —CH_2—NR^1R^2 or cyano, with a secondary amine of the general formula III



$$H—N(R^1)(R^2), \qquad (III)$$

and hydrogen at temperatures ranging from 50° to 250° C. and pressures ranging from 5 to 350 bar in the presence of a catalyst, wherein the catalyst used is palladium on an oxidic support.

5,463,131

SYNTHESIS OF ORGANOHALOBORANES AND ALKOXYORGANOBORANES

Elizabeth R. Burkhardt, Bridgeville, Pa., assignor to Mine Safety Appliances Company, Pittsburgh, Pa.

Filed Jun. 30, 1994, Ser. No. 268,304

Int. Cl.⁶ C07F *5/02*

U.S. Cl. 568—1 **17 Claims**

1. A process for the preparation of a diorganohaloborane compound of the structural formula of R^2R^3BX, comprising the step of reacting in a single reactor a first reactant R selected from the group consisting of an olefin and an alkyne, a second reactant R^1 selected from the group consisting of an olefin and an alkyne, diborane and a boron trihalide of the structural formula BX_3, wherein X is selected from the group consisting of a fluoro, a chloro, a bromo and an iodo group, the mole ratio of boron trihalide to diborane being in the range of approximately 1:1.5 to 1.5:1, wherein R^2 is an alkyl group corresponding to R in the case that R is an olefin, wherein R^2 is an alkenyl group corresponding to R in the case that R is an alkyne, wherein R^3 is an alkyl group corresponding to R^1 in the case that R^1 is an olefin, and wherein R^3 is an alkenyl group corresponding to R^1 in the case that R^1 is an alkyne.

5,463,132

PROCESS FOR THE PREPARATION OF PHOSPHOSULFIDE COMPOUNDS USEFUL AS OIL LUBRICANTS

Maurice Born, Nanterre; Ourida Aberkane, Fameck; Jean-Luc Mieloszynski, Montigny les Metz; Daniel Paquer, Vandoeuvre, and Guy Parc, Rueil Malmaison, all of, France, assignors to Institut Francais du Petrole, Rueil Malmaison, France

Continuation of Ser. No. 749,783, Aug. 26, 1991, Pat. No. 5,306,436. This application Jan. 25, 1994, Ser. No. 186,077

Claims priority, application France, Aug. 24, 1990, 90 10702; Dec. 27, 1990, 90 16530

Int. Cl.⁶ C07C *319/14*

U.S. Cl. 568—22 **5 Claims**

1. A process for preparing an alcohol of the formula

$$R^1—Sx—(CH_2)_n—OH$$

wherein

R^1 is an alkyl or alkenyl group with 4 carbon atoms,

x is 2, 3 or 4, and

n is at least 3,

comprising reacting a R^1—SH thiol with a haloalkanol of the formula

$$Hal—(CH_2)_nOH,$$

in which Hal is a halogen atom, with the addition of elemental sulfur, in the presence of alkali and in an alcoholic medium.

5,463,133

PHENETHYL ALCOHOL DERIVATIVE AND RECORDING MATERIAL CONTAINING THE SAME

Takehiro Sato, Kanagawa; Kimiaki Kinosita, Saitama; Minoru Kaeriyama, Kanagawa, and Tomoya Hidaka, Chiba, all of, Japan, assignors to Nippon Soda Co., Ltd., Tokyo, Japan

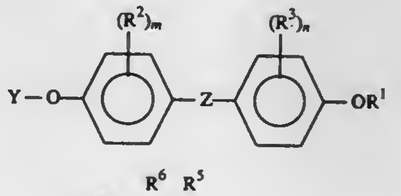
PCT No. PCT/JP93/01368, § 371 Date May 31, 1994, § 102(e) Date May 31, 1994, PCT Pub. No. WO94/07832, PCT Pub. Date Apr. 14, 1994

PCT Filed Sep. 27, 1993, Ser. No. 244,563

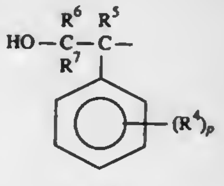
Int. Cl.⁶ C07C *31/08;317/14*

U.S. Cl. 568—33 **7 Claims**

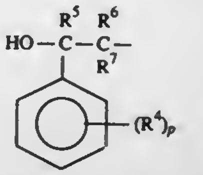
1. A phenethyl alcohol derivative represented by the general formula (I):



(I)



(II)



(III)

wherein Y is a substituent represented by the formula (II) or (III),

R^1 is hydrogen, lower alkyl or unsubstituted aralkyl or aralkyl substituted by halogen, nitro, alkyl having 1 to 5 carbon atoms or alkoxy having 1 to 5 carbon atoms,

R^2, R^3 and R^4 are each independently halogen, nitro, lower alkyl, lower alkoxy, lower alkenyl or lower alkenyloxy,

R^5, R^6 and R^7 are independently hydrogen or lower alkyl,
Z is —SO_2—, —CO—, —$C(CH_3)_2$—, —S—, or —O—,
m, n and p denote independently 0 or an integer from 1 to 4, with the proviso that each substituents represented by R^2, R^3 and R^4 may be different from one another when all of m, n and p are an integer 2 or more.

5,463,134
PARAFFIN TREATING PROCESS FOR MERCAPTAN AND OLEFIN REMOVAL

Stanley J. Frey, Palatine, Ill., assignor to UOP, Des Plaines, Ill.
Filed May 4, 1994, Ser. No. 238,606
Int. Cl.⁶ C07C *319/16*

U.S. Cl. 568—59 **10 Claims**

1. A process for the removal of mercaptans from a paraffin-rich stream which comprises the steps:

(a) passing a feed stream, comprising one or more C_3 to C_6 feed paraffin(s), and also comprising a mercaptan and an olefinic hydrocarbon at a concentration of less than 5 volume % each, with the olefinic hydrocarbon having the same number of carbon atoms per molecule as the feed paraffin(s), into a catalytic distillation column operated at conditions which effect the separation of the compounds present in the column into a net overhead stream, which comprises substantially all of the paraffins which enter the column in the feed stream, and a net bottoms stream which comprises sulfur compounds and dimers of the olefinic hydrocarbons present in the feed stream;

(b) contacting the compounds present in the feed stream, in the substantial absence of hydrogen, with a bed of catalyst located in the catalytic distillation column and maintained at conditions which effect the production of thioethers by the reaction of mercaptans present in the feed stream with olefinic hydrocarbons present in the feed stream and the dimerization of olefinic hydrocarbons; and,

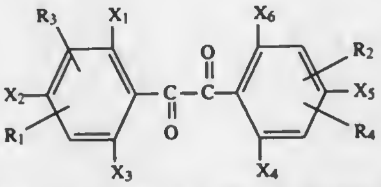
(c) removing said net bottoms stream and said net overhead stream from the column.

5,463,135
FLUORINATED BENZILS AND A PROCESS FOR THEIR PREPARATION

Andreas Kanschik-Conradsen, Garbsen, and Theodor Papenfuhs, Frankfurt am Main, both of, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Germany
Filed Nov. 4, 1993, Ser. No. 147,826
Claims priority, application Germany, Nov. 4, 1992, 42 37 200.3
Int. Cl.⁶ C07C *49/784*

U.S. Cl. 568—331 **10 Claims**

1. A compound of the formula



(1)

in which four X_1 to X_6 and R_1 to R_4 are chlorine or in which at least one, but less than ten, of the substituents X_1 to X_6 is a fluorine atom, and the remaining substituents X_1 to X_6 and the substituents R_1 to R_4 are hydrogen, fluorine, bromine, C_1–C_{10}-alkyl, phenyl or naphthyl which are unsubstituted or substituted by fluorine, chlorine, or bromine or by C_1–C_4-alkyl, cyano, —CHO, or CF_3, or one of the following groups for reducing the electron density: nitro, cyano, —CHO, —COCl, —COF, —CF_3, —SO_2—, alkyl(C_1–C_4), —SO_2F, —SO_2Cl, or —CO-phenyl groups; wherein:

at least one of the substituents X_1 to X_6 and R_1 to R_4 is chlorine, or

at least three, but less than ten, of X_1 to X_6 and R_1 to R_4 are fluorine, or

if X_2 is fluorine and one of X_4 to X_6 and R_2 and R_4 is bromine or nitro and the remaining substituents X_1 to X_6 and R_1 to R_4 are hydrogen, the bromine or nitro substituent is positioned ortho or para to the di-carbonyl substituent, or

if one or two of X_1 to X_6 and R_1 to R_4 is or are fluorine and the remaining substituents X_1 to X_6 and R_1 to R_4 are hydrogen, at least one fluorine substituent is positioned to the dicarbonyl substituent, or

if one of X_1 to X_3 and R_1 and R_3 is fluorine and one of X_4 to X_6 and R_2 and R_4 is methoxy and the remaining substituents X_1 to X_6 and R_1 to R_4 are hydrogen, at least one of the fluorine or methoxy substituents is positioned ortho or meta to the di-carbonyl substituent.

5,463,136
CUMENE HYDROPEROXIDE CLEAVAGE PROCESS

Robert L. Blackbourn, Houston; Edgar D. Allan, Katy; Loc B. Le, and Snehal Patel, both of Houston, all of Tex., assignors to Shell Oil Company, Houston, Tex.
Filed Dec. 22, 1994, Ser. No. 363,437
Int. Cl.⁶ C07C *37/08*

U.S. Cl. 568—385 **18 Claims**

1. A process for the decomposition of cumene hydroperoxide to phenol, acetone, and alphamethylstyrene comprising:

reacting cumene hydroperoxide and sulfuric acid in a reflux cooled reactor,

transporting the reaction products of the reflux cooled reactor under inhibited conditions to a plug flow reactor,

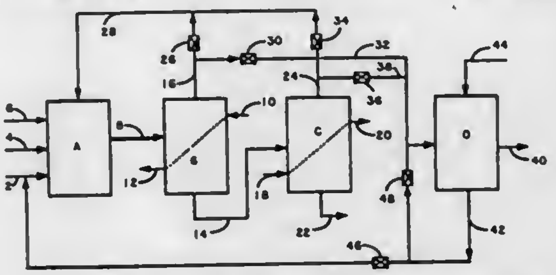
reacting the reaction products of the reflux cooled reactor in the plug flow reactor to produce phenol, acetone, and alpha-methylstyrene, and

recovering a member of the group consisting of phenol, acetone, alpha-methylstyrene, and mixtures thereof.

5,463,137
PROCESS FOR THE PRODUCTION OF OXO PRODUCTS

Ramakrishnan Ramachandran, Allendale, and Loc H. Dao, Bound Brook, both of N.J., assignors to The BOC Group, Inc., New Providence, N.J.
Continuation-in-part of Ser. No. 129,527, Sep. 30, 1993, abandoned. This application Apr. 22, 1994, Ser. No. 231,546
Int. Cl.⁶ C07C *45/50;51/14;29/14*

U.S. Cl. 568—454 **29 Claims**



1. A process for the production of an oxo product selected from butyraldehyde, n-butyl alcohol, butyric acid and mixtures of these comprising the steps:

(a) contacting a propylene stream containing propane as an impurity with carbon monoxide and hydrogen in a reaction zone in the presence of a hydroformylation catalyst under conditions which result in the production of a product stream comprising the oxo product, unreacted propylene and propane;

(b) separating a gas stream comprising unreacted propylene and propane from said product stream;

(c) selectively adsorbing propylene from said gas stream by passing said gas stream through an adsorption zone containing an adsorbent which selectively adsorbs propylene;

(d) regenerating said adsorbent, thereby producing a propylene-enriched gas stream; and

(e) recycling at least part of said propylene-enriched gas stream to said reaction zone.

5,463,138

PROCESS FOR PREPARING DIFLUOROMETHOXYARENES AND DIFLUOROMETHYLTHIOARENES

Klaus-Helmut Müller, Düsseldorf, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed May 18, 1994, Ser. No. 245,330

Claims priority, application Germany, May 25, 1993, 43 17 322.5

Int. Cl.^{6} C07C *41/01*

U.S. Cl. 568—655 **11 Claims**

1. In the preparation of a difluoromethoxyarene or a difluoromethylthioarene of the formula (I)

$$Ar—Q—CHF_2$$

in which

Ar represents phenyl or naphthyl, each optionally substituted by at least one member selected from the group consisting of halogen, nitro, cyano, carboxyl, carbamoyl, C_1–C_4-alkyl (which is optionally substituted by halogen, cyano, carboxyl, carbamoyl, hydroxyl, amino, C_1–C_4-alkoxy or by a geminate bis-(C_1–C_4-alkoxy)-grouping or by C_1–C_4-alkoxy-carbonyl or phenyl), C_1–C_4-alkoxy (which is optionally substituted by halogen, cyano, carboxyl, carbamoyl, hydroxyl, amino, C_1–C_4-alkoxy or C_1–C_4-alkoxy-carbonyl, C_1–C_4-alkylthio, C_1–C_4-alkylsulphinyl, C_1–C_4-alkyl-sulphonyl (each of which is optionally substituted by halogen), C_1–C_4-alkylamino, di-(C_1–C_4-alkyl)-amino, C_1–C_4-alkyl-carbonyl, C_1–C_4 alkylaminocarbonyl, di-(C_1–C_4-alkyl)-amino-carbonyl, C_1–C_4-alkyl-carbonyloxy, C_1–C_4-alkyl-carbonylamino, C_1–C_4-alkoxy-carbonyloxy, C_1–C_4-alkoxy-carbonylamino, C_1–C_4-alkylamino-carbonyloxy or C_1–C_4-alkylamino-carbonylamino (each of which is optionally substituted by halogen or C_1–C_4-alkoxy), phenyl, phenoxy, phenylthio, phenylsulphinyl, phenylsulphonyl, phenylamino, phenylcarbonyl, phenylazo or phenylazoxy (each of which is optionally substituted as indicated above), and

Q is oxygen or sulphur,

wherein a hydroxyarene or mercaptoarene of the formula

$$Ar—Q—H \qquad (II)$$

is reacted with chlorodifluoromethane ($ClCHF_2$) in the presence of an aqueous alkali metal hydroxide or alkaline earth metal hydroxide at a temperature between 20° C. and 120° C., the improvement which comprises carrying out the reaction in the presence of a phase-transfer catalyst selected from the group consisting of a tetrasubstituted ammonium salt and a phosphonium salt, and in the presence of a non-polar or moderately polar solvent selected from the group consisting of an aliphatic or alicyclic hydrocarbon, an aromatic hydrocarbon which is optionally substituted by chlorine, and a branched alkyl ether.

5,463,139

PRODUCTION OF DIFLUOROMETHANE

Jane L. Butcher, Abbots Lodge; Thomas A. Ryan, Kelsall, and Leslie Burgess, Runcorn, all of, England, assignors to Imperial Chemical Industries PLC, London, England

Continuation of Ser. No. 24,255, Mar. 1, 1993, abandoned, which is a division of Ser. No. 898,786, Jun. 15, 1992, abandoned. This application Jun. 29, 1994, Ser. No. 268,659

Claims priority, application United Kingdom, Jun. 14, 1991, 9112817; Jun. 14, 1991, 9112860; Jun. 14, 1991, 9112861; Nov. 13, 1991, 9124087; Dec. 11, 1991, 9126330

Int. Cl.^{6} C07C *41/00*

U.S. Cl. 568—683 **10 Claims**

1. A process for the production of difluoromethane which comprises (a) contacting formaldehyde with liquid hydrogen fluoride to form a product comprising bis(fluoromethyl) ether and water, (b) separating at least a part of the water from the bis(fluoromethyl) ether and (c) feeding the bis(fluoromethyl) ether and less than an equimolar amount of water to a reaction zone containing a catalyst for a time and under conditions to produce difluoromethane in a yield greater than 20% based upon the amount of bis(fluoromethyl) ether feed.

5,463,140

PROCESS FOR MAKING POLYPHENOLS FROM KETONES OR ALDEHYDES AND PHENOLS

Richard M. Wehmeyer, Lake Jackson; Marlin E. Walters, West Columbia; Emmett L. Tasset, and Steven L. Brewster, both of Lake Jackson, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Aug. 31, 1994, Ser. No. 298,622

Int. Cl.^{6} C07C *39/16*

U.S. Cl. 568—727 **68 Claims**

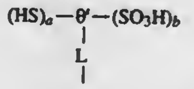
1. A process for the condensation of an aldehyde or ketone starting material with a phenol, unsubstituted in at least one position, comprising reacting the aldehyde or ketone starting material with the phenol in a reaction mixture in the presence of a soluble or insoluble mercaptosulfonic acid compound under conditions sufficient to bring about formation of a geminal bisphenolic moiety at each aldehyde or ketone moiety in the starting material;

provided that the soluble mercaptosulfonic acid compound is characterized by the formula

$$(HS)_a\text{-}\theta\text{-}(SO_3H)_b,$$

wherein θ is an alkylene, cycloaliphatic, arylene, alkylene-arylene, alkylenecycloaliphatic, alkylenearyl, heterocyclic or alkyleneheterocyclic residue and a and b are independently selected from integers from 1 to about 20; and

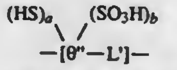
the insoluble mercaptosulfonic acid comprises a catalytically-active species represented by the formula



$$(HS)_a—\theta'—(SO_3H)_b \qquad (a)$$

in which θ' is an alkylene, cycloaliphatic, arylene, alkylene-arylene, alkylenecycloaliphatic, alkylenearyl, heterocyclic or alkyleneheterocyclic residue; a and b are independently selected from integers from 1 to about 20; L is an optional linking group and — is a bond, which catalytically-active species is attached by the bond — to an insoluble organic or inorganic support;

or a catalytically-active species represented by the unit formula



$$—[\theta''—L']— \qquad (b)$$

wherein θ" is an alkylene, arylene, cycloaliphatic, alkylene-arylene, alkylenecycloaliphatic, alkylenearyl, heterocyclic or alkyleneheterocyclic residue; a and b are independently selected from integers from 1 to about 20; L' is an optional linking group and — is a bond.

5,463,141
PROCESS FOR PREPARING POLY(4-HYDROXYSTYRENE)

James R. Sounik, Corpus Christi; William W. Wilkison, III, Richardson, and Keith M. Russ, Corpus Christi, all of Tex., assignors to Hoechst Clanese Corporation, Somerville, N.J.

Filed Dec. 19, 1994, Ser. No. 358,431

Int. Cl.⁶ C07C *39/10;39/205*

U.S. Cl. 568—763 **17 Claims**

1. A process for preparing polyhydroxystyrene which comprises the step of heating p-α-aminoethylphenol under suitable conditions of temperature and pressure and for a sufficient period of time to form said polyhydroxystyrene.

5,463,142
METHOD FOR THE PREPARATION OF D-CHIRO-INOSITOL

David A. Riley, Kenosha, Wis.; Steven A. Chamberlin, Waukegan, and Ashok V. Bhatia, Libertyville, both of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

Filed Nov. 10, 1994, Ser. No. 337,656

Int. Cl.⁶ C07C *35/16*

U.S. Cl. 568—833 **27 Claims**

1. A method for the preparation of D-chiro-inositol from kasugamycin, comprising the steps of:

(a) reacting kasugamycin with an acetylating agent to form a crude hexa-acetate;

(b) purifying the crude hexa-acetate to form purified hexa-acetate;

(c) deacetylating the purified hexa-acetate to form D-chiro-inositol; and

(d) isolating the D-chiro-inositol.

5,463,143
PROCESS FOR THE DIRECT HYDROGENATION OF WAX ESTERS

David M. Singleton, and Brendan D. Murray, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Nov. 7, 1994, Ser. No. 335,024

Int. Cl.⁶ C07C *29/136;29/141*

U.S. Cl. 568—864 **15 Claims**

1. A process for the direct hydrogenation of wax esters which comprises contacting and reacting one or more wax esters with hydrogen under liquid phase hydrogenation conditions in the presence of a catalyst comprising a copper compound, a zinc compound and at least one rare earth compound.

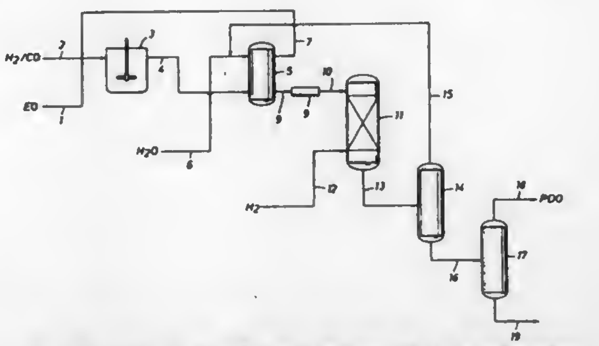
5,463,144
PROCESS FOR PREPARING 1,3-PROPANEDIOL

Joseph B. Powell; Lynn H. Slaugh, both of Houston; Thomas C. Forschner, Richmond; Terry B. Thomason, Houston; Thomas C. Semple, Friendswood; Paul R. Weider, Houston, and Juan P. Arhancet, Katy, all of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Sep. 30, 1994, Ser. No. 316,671

Int. Cl.⁶ C07C *27/20;45/49;47/17*

U.S. Cl. 568—867 **17 Claims**



1. A process for preparing 1,3-propanediol comprising the steps of:

(a) contacting ethylene oxide with carbon monoxide and hydrogen in an essentially non-water-miscible organic solvent in the presence of an effective amount of a non-phosphine ligated cobalt hydroformylation catalyst and an effective amount of a lipophilic quaternary ammonium salt promoter at a temperature within the range of about 50° to about 100° C. and a pressure within the range of about 500 to about 5000 psig, under reaction conditions effective to produce an intermediate product mixture comprising less than 15 wt % 3-hydroxypropanal;

(b) adding an aqueous liquid to said intermediate product mixture and extracting into said aqueous liquid at a temperature less than about 100° C. a major portion of the 3-hydroxypropanal so as to provide an aqueous phase comprising 3-hydroxypropanal in greater concentration than the concentration of 3-hydroxypropanal in said intermediate product mixture and an organic phase comprising at least a portion of the cobalt catalyst or a cobalt-containing derivative thereof and at least a portion of the lipophilic quaternary ammonium salt;

(c) separating the aqueous phase from the organic phase;

(d) contacting the aqueous phase comprising 3-hydroxypropanal with hydrogen in the presence of a hydrogenation catalyst at a pressure of at least about 100 psig and a temperature during at least a portion of the hydrogenation step of at least about 40° C. to provide a hydrogenation product mixture comprising 1,3-propanediol;

(e) recovering 1,3-propanediol from the hydrogenation product mixture; and

(f) returning at least a portion of the organic phase comprising cobalt catalyst or a cobalt-containing derivative thereof and lipophilic quaternary ammonium salt to the process of step (a).

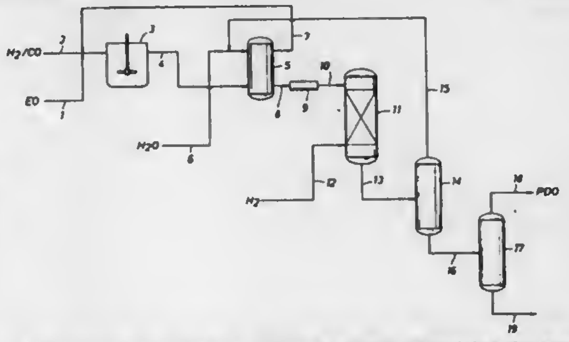
5,463,145
PROCESS FOR PREPARING 1,3-PROPANEDIOL

Joseph B. Powell; Lynn H. Slaugh, both of Houston; Thomas C. Forschner, Richmond; Thomas C. Semple, Friendswood, and Paul R. Weider, Houston, all of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Sep. 30, 1994, Ser. No. 316,673

Int. Cl.⁶ C07C *27/20;45/49;47/17*

U.S. Cl. 568—867 **11 Claims**



1. A process for preparing 1,3-propanediol comprising the steps of:

(a) contacting, in an essentially non-water-miscible organic solvent, ethylene oxide with carbon monoxide and hydrogen in the presence of an effective amount of a non-phosphine ligated cobalt hydroformylation catalyst and an effective amount of a lipophilic quaternary phosphonium salt promoter, at a temperature within the range of about 50° to about 100° C. and a pressure within the range of about 500 to about 5000 psig, under reaction conditions effective to produce an intermediate product mixture comprising less than 15 wt % 3-hydroxypropanal;

(b) adding an aqueous liquid to said intermediate product mixture and extracting into said aqueous liquid at a temperature less than about 100° C. a major portion of the 3-hydroxypropanal, to provide an aqueous phase comprising 3-hydroxypropanal in greater concentration than the concentration of 3-hydroxypropanal in said intermediate product mixture, and an organic phase comprising at least a portion of the cobalt catalyst or a cobalt-containing derivative thereof and at least a portion of the lipophilic quaternary phosphonium salt;

(c) separating the aqueous phase from the organic phase;

(d) contacting the aqueous phase comprising 3-hydroxypropanal with hydrogen in the presence of a hydrogenation catalyst at a pressure of at least about 100 psig and a temperature during at least a portion of the hydrogenation step of at least about 40° C. to provide a hydrogenation product mixture comprising 1,3-propanediol;

(e) recovering 1,3-propanediol from the hydrogenation product mixture; and

(f) returning at least a portion of the organic phase comprising cobalt catalyst or a cobalt-containing derivative thereof and lipophilic quaternary phosphonium salt to the process of step (a).

5,463,146

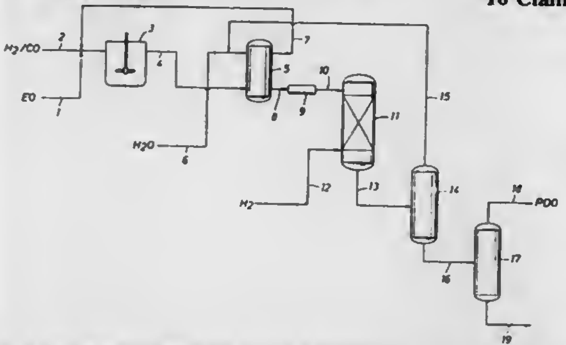
PROCESS FOR PREPARING 1,3-PROPANEDIOL

Lynn H. Slaugh; Joseph B. Powell, both of Houston; Thomas C. Forschner, Richmond; Thomas C. Semple, Friendswood, and Paul R. Weider, Houston, all of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Sep. 30, 1994, Ser. No. 316,677

Int. Cl.⁶ C07C *27/20;45/49;47/17*

U.S. Cl. 568—862 **16 Claims**



1. A process for preparing 1,3-propanediol comprising the steps of:

(a) contacting, at a temperature within the range of about 50° to about 100° C. and a pressure within the range of about 500 to about 5000 psig, ethylene oxide with carbon monoxide and hydrogen in an essentially non-water-miscible solvent in the presence of an effective amount of a non-phosphine ligated cobalt hydroformylation catalyst and an effective amount of a lipophilic arsine promoter under reaction conditions effective to produce an intermediate product mixture comprising less than 15 wt % 3-hydroxypropanal;

(b) adding an aqueous liquid to said intermediate product mixture and extracting into said aqueous liquid a major portion of the 3-hydroxypropanal at a temperature less than about 100° C. to provide an aqueous phase comprising 3-hydroxypropanal in greater concentration than the concentration of 3-hydroxypropanal in the intermediate product mixture, and an organic phase comprising at least a portion of the cobalt catalyst or a cobalt-containing derivative thereof and at least a portion of the lipophilic arsine;

(c) separating the aqueous phase from the organic phase;

(d) contacting the aqueous phase comprising 3-hydroxypropanal with hydrogen in the presence of a hydrogenation catalyst at a pressure of at least about 100 psig and a temperature during at least a portion of the hydrogenation step of at least about 40° C. to provide a hydrogenation product mixture comprising 1,3-propanediol;

(e) recovering 1,3-propanediol from the hydrogenation product mixture; and

(f) returning at least a portion of the organic phase comprising the cobalt catalyst or a cobalt-containing derivative thereof and lipophilic arsine to the process of step (a).

5,463,147

DECYL ALCOHOL MIXTURES, PHTHALIC ESTERS OBTAINABLE THEREFROM AND THEIR USE AS PLASTICIZERS

Helmut Bahrmann, Hamminkeln; Wolfgang Greb, Dinslaken; Peter Heymanns, Essen; Peter Lappe; Thomas Müller, both of Dinslaken; Jürgen Szameitat, Wesel, and Ernst Wiebus, Oberhausen, all of, Germany, assignors to Hoechst Aktiengesellschaft, Germany

Filed Sep. 23, 1994, Ser. No. 311,561

Claims priority, application Germany, Sep. 30, 1993, 43 33 324.9

Int. Cl.⁶ C07C *27/22;29/141;31/125*

U.S. Cl. 568—882 **8 Claims**

1. An alcohol mixture of isomeric decyl alcohols which is the product of hydroformylation of an olefinic mixture containing butene-1 and butene-2, said hydroformylation being carried out in a first stage and a second stage,

said first stage comprising a first hydroformylation of said olefin mixture in a heterogeneous reaction system at a first temperature of 70° to 150° C. and under a first pressure of 0.4 to 30 MPa in the presence of an aqueous solution of a first catalyst, said first catalyst comprising at least one rhodium compound and at least one water-soluble phosphine, to form a first reaction mixture containing a first aldehyde mixture,

separation of said first aldehyde mixture from said first reaction mixture leaving a residue which contains butene-2,

said second stage comprising a second hydroformylation of said residue in a homogeneous reaction system at a second temperature of 130° to 180° C. and under a second pressure of 8 to 30 MPa in the presence of a cobalt catalyst to form a second reaction mixture containing a second aldehyde mixture, separation of said second aldehyde mixture from said second reaction mixture,

combination of said first aldehyde mixture with said second aldehyde mixture to form a combined aldehyde mixture, condensation of said combined aldehyde mixture to form a third reaction mixture containing an aldol mixture, separation of said aldol mixture from said third reaction mixture, and hydrogenation of said aldol mixture to form said alcohol mixture.

5,463,148

PROCESS FOR THE PREPARATION OF CHLOROFLUORONITROBENZENES

Theodor Papenfuhs, Frankfurt am Main; Andreas Kanschik-Conradsen, Gernsheim/Rhein, and Wilfried Pressler, Kelkheim (Taunus), all of, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Germany

Continuation of Ser. No. 914,296, Jul. 15, 1992, abandoned. This application May 5, 1994, Ser. No. 238,582

Claims priority, application Germany, Jul. 17, 1991, 41 23 600.9

Int. Cl.^{6} C07C *205/00*

U.S. Cl. 568—938 **13 Claims**

1. A process for the preparation of chlorofluoronitrobenzenes in high yields, which comprises the steps of:

reacting dichloronitrobenzenes with alkali metal fluorides having a water content of from 0.2% by weight up to about 2.5% by weight in the presence of a catalyst selected from the group consisting of a quaternary ammonium salt, a quaternary phosphonium salt, a crown ether, a polyethylene glycol dimethyl ether, and mixtures thereof in the presence of an aprotic solvent, the boiling point of said aprotic solvent being below the reaction temperature under the pressure conditions chosen, at temperatures of about 125° C. to about 200° C., and

removing compounds from the reaction by removing the boiling solvent during the reaction.

5,463,149

1-HALO-CIS-3-TETRADECENES AND PROCESSES FOR THE PREPARATION OF CIS-OLEFIN COMPOUNDS BY USING SAME

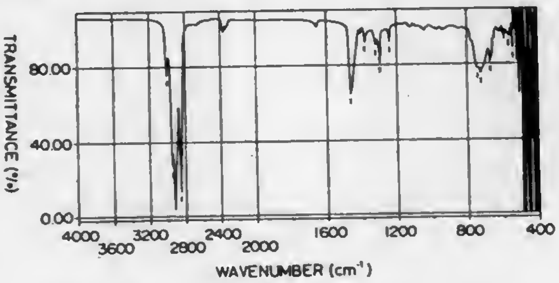
Takehiko Fukumoto; Daisuke Iwai; Shigeo Okano; Hiroshi Suzuki, and Mitsuyoshi Oshima, all of Joetsu, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Jul. 12, 1994, Ser. No. 274,139

Claims priority, application Japan, Jul. 20, 1993, 5-178694

Int. Cl.^{6} C07C *19/08*

U.S. Cl. 570—135 **2 Claims**



1. A compound having the formula (I)

$$CH_3(CH_2)_9CH{=}CH(CH_2)_2X^a \qquad (I)$$

wherein X^a is a halogen atom selected from the group consisting of chlorine, bromine and iodine.

5,463,150

PROCESS FOR PREPARING HEXAFLUOROBUTENE

Norbert Lui, Köln; Albrecht Marhold, Leverkusen, and Dietmar Bielefeldt, Ratingen, all of, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Feb. 14, 1994, Ser. No. 195,236

Claims priority, application Germany, Feb. 19, 1993, 43 05 163.4

Int. Cl.^{6} C07C *17/34*

U.S. Cl. 570—157 **8 Claims**

1. A process for preparing 1,1,1,4,4,4-hexafluorobut-2-ene, which comprises to react a chlorofluorobutane of the formula (I)

$$CF_3{-}CH_2CHCl{-}CX_3, \qquad (I)$$

in which the —CX_3 group represents a member of the group consisting of CCl_3, CCl_2F and $CClF_2$ with alkali metal fluoride in an aprotic polar solvent.

5,463,151

PROCESS FOR PREPARING 1,1,1,2-TETRAFLUOROETHANE

Paolo Cuzzato, Treviso, and Antonio Masiero, Padua, both of, Italy, assignors to Ausimont S.r.L., Milan, Italy

Continuation of Ser. No. 191,765, Feb. 3, 1994, abandoned, which is a continuation of Ser. No. 928,188, Aug. 14, 1992, abandoned, which is a continuation of Ser. No. 811,920, Dec. 23, 1991, abandoned, which is a continuation of Ser. No. 550,559, Jul. 10, 1990, abandoned. This application Nov. 10, 1994, Ser. No. 337,128

Claims priority, application Italy, Jul. 12, 1989, 21159A/89

Int. Cl.^{6} C07C *17/08*

U.S. Cl. 570—166 **10 Claims**

1. A process for preparing 1,1,1,2-tetrafluoroethane which comprises reacting, in the gas phase, trichloroethylene with 1,1,1-trifluorochloroethane and hydrofluoric acid, operating with trichloroethylene/1,1,1-trifluorochloroethane molar ratios ranging from 5/95 to 50/50 and with HF/(trichloroethylene+1,1,1-trifluorochloroethane) molar ratios of at least 3/1 and in the presence of a catalyst consisting essentially of Cr_2O_3 carried on AlF_3.

5,463,152

HALOFLUOROCARBON HYDROGENOLYSIS

V N. Mallikarjuna Rao, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 8, 1994, Ser. No. 351,907

Int. Cl.^{6} C07C *19/08*

U.S. Cl. 570—176 **10 Claims**

1. A process for the hydrogenolysis of a saturated acyclic starting material of the formula $C_nH_aX_bF_c$, wherein each X is selected from the group consisting of Cl and Br, n is an integer from 1 to 4, a is an integer from 0 to 3, b is an integer from 1 to 4 and c is an integer from 1 to 9, comprising:

reacting said starting material with hydrogen at an elevated temperature of about 300° C. or less in the presence of a catalyst containing a catalytically effective amount of palladium supported on trivalent chromium oxide and in the presence of an acid of the formula HZ where Z is selected from the group consisting of Cl, Br, F and mixtures thereof, to produce a product compound of the formula $C_nH_dX_eF_c$ where e is less than b and d+e equals a+b.

5,463,153

PROCESS FOR PREPARING 1-CHLORO-1,3-BUTADIENE

Isabelle Storet, Les Eparres, France, assignor to Enichem Elastomeres France S.A., Courbevoie, France

Filed Sep. 19, 1994, Ser. No. 307,425

Claims priority, application France, Sep. 19, 1993, 93 11304

Int. Cl.^{6} C07C *21/00*

U.S. Cl. 570—227 **4 Claims**

1. Process for preparing 1-chloro-1,3-butadiene, characterized in that a dichlorobutene selected from 3,4-dichloro-1-butene, 1,4-dichloro-2-butene and their mixtures, is dehydrochlorinated in gas phase, in the presence of a catalyst selected from lanthanum phosphate, lanthanum phosphate doped with at least one alkali or alkali-earth metal, and mixtures of said phosphates.

5,463,154

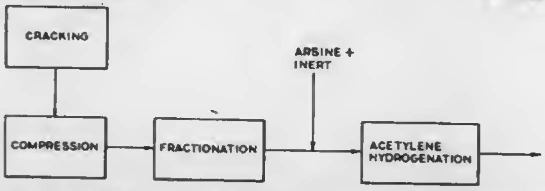
ARSINE AND PHOSPHINES AS ACETYLENE CONVERTER MODERATORS

David R. Slim, Houston; Edgar L. Mohundro, Baytown, both of Tex., and Stephen M. Mayo, Stillwater, Okla., assignors to Exxon Chemical Patents Inc., Wilmington, Del.

Continuation of Ser. No. 881,902, May 12, 1992, abandoned. This application Jun. 22, 1994, Ser. No. 263,986

Int. Cl.^{6} C07C ***5/03;7/152;7/00***

U.S. Cl. 585—261 **26 Claims**



1. A process for removing acetylene from a hydrocarbon stream, said process comprising:

exposing a hydrocarbon stream comprising acetylene to a hydrogenation catalyst in the presence of an acetylene converter moderator selected from the group consisting of arsine and phosphine in an amount within the range of about 0.01 wppb to about 10 wppb which is introduced into said stream and which substantially remains on said hydrogenation catalyst and does not substantially migrate into said hydrocarbon stream under conditions effective to support acetylene hydrogenation.

5,463,155

UPGRADING OF CYCLIC NAPHTHAS

Leonid B. Galperin, Chicago; Jeffery C. Bricker, Buffalo Grove, and Jennifer S. Holmgren, Bloomingdale, all of Ill., assignors to UOP, Des Plaines, Ill.

Filed Nov. 15, 1993, Ser. No. 151,692

Int. Cl.^{6} C07C ***1/00;2/00;5/13***

U.S. Cl. 585—310 **17 Claims**

1. A process combination for selectively upgrading a naphtha feedstock to obtain a product having an increased isoparaffin content comprising the steps of:

(a) contacting the naphtha feedstock in a ring-cleavage zone with a nonacidic ring-cleavage catalyst, comprising at least one platinum-group metal component and a support selected from the group consisting of a nonacidic alumina, a metal-oxide solid solution and a nonacidic large-pore molecular sieve, at cleavage conditions comprising a temperature of from 100° to 550° C., pressure of from 100 kPa to 10 MPa and liquid hourly space velocity of from 0.1 to 30 hr^{-1} to convert about 60% or more of the naphthenes in the feedstock by selective ring opening and produce a paraffinic intermediate; and,

(b) converting the paraffinic intermediate in an isomerization zone maintained at isomerization conditions comprising a temperature of from 40° to 250° C., pressure of from 100 kPa to 10 MPa and liquid hourly space velocity of from 0.2 to 15 hr^{-1} with a solid acid isomerization catalyst comprising at least one platinum-group metal component and recovering an isoparaffin-rich product.

5,463,156

METHOD AND APPARATUS FOR DEHYDROGENATION

Takashiro Muroi, Ushiku; Toshio Sato, Kashima; Ikuo Ito, Kashima, and Kyoichi Takeda, Kashima, all of, Japan, assignors to Sumikin Chemical Co., Ltd., Japan

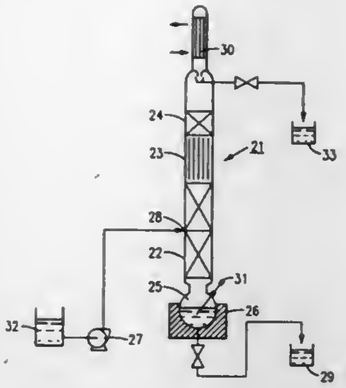
Filed Jun. 11, 1993, Ser. No. 75,954

Claims priority, application Japan, Jun. 11, 1992, 4-179484

Int. Cl.^{6} C07C ***5/32***

U.S. Cl. 585—400 **10 Claims**

1. A method of dehydrogenation, comprising the steps of:



feeding a raw material into a reaction apparatus comprising an evaporation section, a catalyst bed section, and a reflux condenser section for a vapor;

producing a vapor in said evaporation section;

passing said vapor through said catalyst bed section; then

liquefying said vapor in said reflux condenser section; and

returning at least a portion of a liquid obtained by liquefying said vapor to said catalyst bed section.

5,463,157

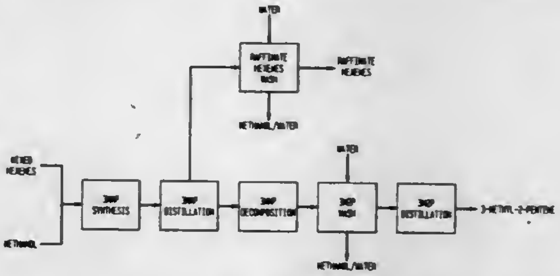
PROCESS FOR PREPARING 3-METHYL-2-PENTENE

Dan E. Hendriksen, Kingwood, Tex.; Gerald G. McGlamery; Michael J. Keenan, both of Baton Rouge, La., and Derrick D. Pete, Missouri City, Tex., assignors to Exxon Chemical Patents, Inc., Wilmington, Del.

Filed Oct. 29, 1993, Ser. No. 146,374

Int. Cl.^{6} C07C ***2/04;2/26;2/34;2/24***

U.S. Cl. 585—511 **17 Claims**



1. A method for producing 3-methyl-2-pentene which comprises the steps of:

(a) trimerizing an ethylene feedstream and/or co-dimerizing an ethylene and 1-butene feedstream at a temperature in the range between about 0° C. to about 100° C. and at a pressure sufficient to maintain said ethylene or ethylene and 1-butene in the liquid phase in the presence of a titanium-based catalyst which forms a hydrocarbon product comprising at least 2-ethyl-1-butene;

(b) separating said hydrocarbon product from said titanium-based catalyst;

(c) etherifying said hydrocarbon product by mixing said hydrocarbon product and at least one alcohol to produce an etherification mixture, and catalytically reacting said etherification mixture in the presence of an etherification catalyst under reaction conditions which form an ether-containing stream from said hydrocarbon product and said alcohol;

(d) separating an ether product from said ether-containing stream;

(e) contacting said ether product with a catalyst which is capable of decomposing said ether product to form a 3-methyl-2-pentene stream which comprises unreacted ether product; and

(f) separating said alcohol of step (c) and said unreacted ether product of step (e) from said 3-methyl-2-pentene stream to form a 3-methyl-2-pentene product.

5,463,158

OLIGOMERIZATION OF LOW MOLECULAR WEIGHT OLEFINS IN AMBIENT TEMPERATURE MELTS

Maciej Goledzinowski, Gloucester, and Viola L Birss, Calgary, both of, Canada, assignors to Her Majesty the Queen in right of Canada, as represented by the Minister of Energy, Mines and Resources, Ontario, Canada

Continuation of Ser. No. 14,227, Feb. 5, 1993, abandoned, which is a continuation-in-part of Ser. No. 838,949, Feb. 21, 1992, abandoned. This application Mar. 7, 1994, Ser. No. 206,276

Int. Cl.^{6} C07C *2/14*

U.S. Cl. 585—520 **4 Claims**

1. A process for catalytic oligomerization of low molecular weight C_2–C_4 olefins to form higher hydrocarbons which comprises reacting said olefins under oligomerization conditions, in the presence of a catalyst consisting essentially of a molten salt mixture which is liquid at room temperature and is essentially free from organic solvent, said molten salt catalyst being obtained by combining (a) an aluminum halide in solid form and (b) a Lewis base component in solid form comprising an organic salt selected from the group consisting of organic halide salts containing a N-heterocyclic ring and organic salts containing fully substituted onium ions, in the molar ratio of aluminum halide: Lewis base of about 1:2 to 2:1, said molten mixture being a pure mixture of ions containing no aluminum halide dissolved in the Lewis base and containing no aluminum halide-Lewis base complex.

5,463,159

THERMAL CRACKING PROCESS

Ricardo J. Callejas, Sweeny, Tex., and Gil J. Greenwood, Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 22, 1994, Ser. No. 216,003

Int. Cl.^{6} C07C *4/04*

U.S. Cl. 585—648 **20 Claims**

1. A process comprising contacting a cracking tube of a thermal cracking furnace, used in a thermal cracking process for converting a saturated hydrocarbon to an olefinic compound, with a fluid stream which consists essentially of steam, a hydrogen-containing fluid, and a hydrogen sulfide precursor under conditions sufficient to effect the generation of hydrogen sulfide in said cracking tube before a saturated hydrocarbon is introduced into said cracking tube.

5,463,160

SKELETAL ISOMERIZATION OF N-PENTENES TO ISOPENTENE ON PRETREATED ZEOLITES

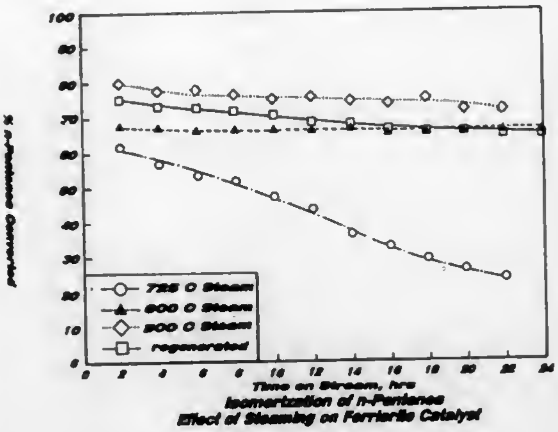
Erven J. Kuhlmann, Hopewell Junction; James R. Pascoe, Fishkill, and Christopher J. Thom, Beacon, all of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Aug. 30, 1993, Ser. No. 112,999

Int. Cl.^{6} C07C *5/27*

U.S. Cl. 585—671 **6 Claims**

1. A process for the skeletal isomerization of an n-olefin of from 4 to 12 carbon atoms to provide a branched olefin product which comprises contacting the n-olefin under skeletal isomerization conditions with, as skeletal isomerization catalyst, a steam pretreated, alumina matrix-bound zeolite catalyst, said zeolite having a pore size of at least about 4.2 angstroms and less than 6.0 angstroms and a pore structure characterized by intersecting 10-member ring and 8-member ring channels.



5,463,161

OLEFIN ISOMERIZATION PROCESS

Gregory J. Gajda, Mount Prospect, and Paul T. Barger, Arlington Heights, both of Ill., assignors to UOP, Des Plaines, Ill.

Continuation-in-part of Ser. No. 995,471, Dec. 22, 1992, Pat. No. 5,336,831, which is a continuation-in-part of Ser. No. 814,167, Dec. 30, 1991, Pat. No. 5,191,146, which is a continuation-in-part of Ser. No. 670,139, Mar. 15, 1991, Pat. No. 5,132,484, which is a continuation-in-part of Ser. No. 442,879, Nov. 29, 1989, abandoned. This application Sep. 17, 1993, Ser. No. 121,860

The portion of the term of this patent subsequent to Jul. 21, 2009, has been disclaimed.

Int. Cl.^{6} C07C *5/22;5/23;5/25;5/27*

U.S. Cl. 585—671 **20 Claims**

1. A process for the skeletal isomerization of hindered olefins to reduce the proportion of alkyl substituents on the olefins which comprises contacting a feedstock containing hindered olefins at isomerization conditions with a catalyst containing at least one non-zeolitic molecular sieve to obtain a product containing a lower proportion of hindered olefins.

5,463,162

ALKYLATION CATALYST REGENERATION

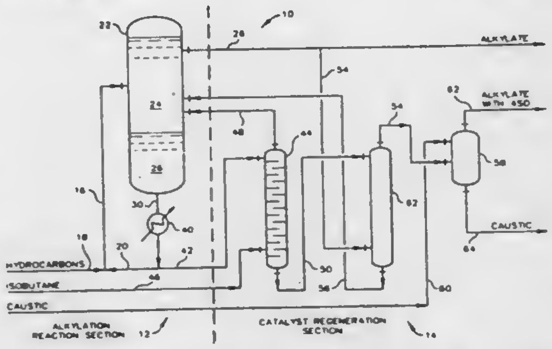
Alan D. Eastman, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 21, 1994, Ser. No. 184,792

The portion of the term of this patent subsequent to Nov. 23, 2010, has been disclaimed.

Int. Cl.^{6} C07C *2/62;7/10*

U.S. Cl. 585—724 **11 Claims**

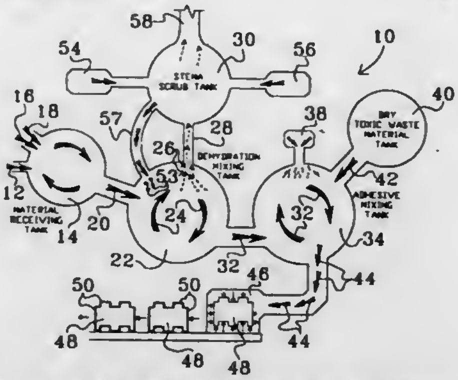


1. A process for removing acid soluble oil (ASO) from a sulfone-containing mixture containing a sulfone component and ASO, said process comprising the step of:

contacting with said sulfone-containing mixture a hydrocarbon in an amount sufficient to remove from said sulfone-containing mixture at least a portion of the ASO contained therein and to thereby form an ASO containing hydrocarbon phase and a sulfone-containing phase.

5,463,163
PROCESS FOR ABSORBING TOXIC WASTE FOR LONG TERM PERMANENT STORAGE

Trent P. Young; Trent P. Young, Jr., both of Longmont; Paul R. Ingram, Thornton, and Steven J. Ingram, Denver, all of Colo., assignors to SOL-CAP, Inc., Longmont, Colo.
Filed Mar. 29, 1993, Ser. No. 38,485
Int. Cl.^{6} B09B *3/00*
U.S. Cl. 588—249 **16 Claims**



1. A process for absorbing toxic waste in an agglomerate using a sponge material, the sponge material of mineral origin having long flexible fibers interwoven, the steps comprising:

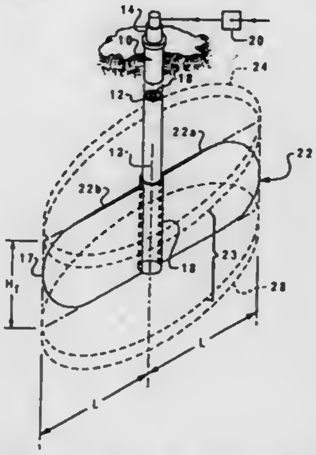
mixing the sponge material with the toxic waste;

coating the exterior surface of the sponge material prevent seepage and migration of the toxic waste from the sponge material; and

compacting the coated sponge material with toxic waste for disposal.

5,463,164
WASTE DISPOSAL IN SUBTERRANEAN EARTH FORMATIONS

Thomas K. Perkins, Dallas, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.
Filed Mar. 22, 1994, Ser. No. 216,002
Int. Cl.^{6} B09B *3/00;* **A62D** *3/00*
U.S. Cl. 588—250 **14 Claims**



1. A method for disposing of particulate waste solids in the form of a slurry into the earth from an injection well, comprising the steps of:

locating an earth formation disposal zone bounded at least one of above or below by an earth formation zone having a higher in situ stress field;

forming a hydraulic fracture in said earth formation disposal zone;

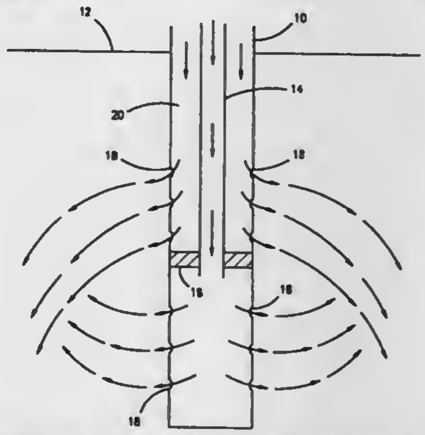
determining the compaction of the formation in the disposal zone caused by said hydraulic fracture formed in the disposal zone at selected pressures;

determining the fracture volume based on the in situ stress distribution, the fracture length and height and said compaction; and

injecting a predetermined volume of solids laden slurry through said well into the disposal zone.

5,463,165
SCRUBBING OF OILFIELD WASTE GAS IN SUBTERRANEAN FORMATIONS

Paul S. Northrop, Bakersfield, Calif., assignor to Mobil Oil Corporation, Fairfax, Va.
Filed Dec. 20, 1993, Ser. No. 169,235
Int. Cl.^{6} B09B *3/00*
U.S. Cl. 588—250 **22 Claims**



1. A method for scrubbing hazardous components from waste gas or flue gas in a depleted or swept region of a reservoir comprising:

coinjecting a waste gas or flue gas and an aqueous reactant into a depleted region of a reservoir in an amount and for a time sufficient to remove hazardous components from said gas thereby scrubbing said waste gas before the scrubbed gas is removed from said reservoir.

5,463,166
REACTIVATION OF ALKANE ISOMERIZATION CATALYSTS

Fan-Nan Lin, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.
Filed May 27, 1994, Ser. No. 250,225
Int. Cl.^{6} C07C *5/22;* **B01J** *38/10*
U.S. Cl. 585—748 **13 Claims**

1. In a process for isomerizing lower alkanes which comprises contacting a mixture of (i) a first stream comprising at least one normal alkane containing 4–7 carbon atoms per molecule and additionally about 0.001–1 weight percent chloride in the form of at least one chlorinated hydrocarbon and (ii) a second stream consisting essentially of hydrogen gas with (iii) an isomerization catalyst consisting essentially of platinum, chlorine and alumina as support material in a reaction zone at effective alkane isomerization conditions comprising a reaction temperature in the range of about 200° F. to about 450° F. for a prolonged period of time until said isomerization catalyst has become a partially deactivated catalyst,

the improvement which consists essentially of (a) discontinuing the flow of said first stream comprising at least one normal alkane and at least one chlorinated hydrocarbon while continuing the flow of said second stream consisting essentially of hydrogen gas in contact with said partially deactivated catalyst for a time period of at least about 1 hour at a temperature of about 80°–350° F. so as to obtain a reactivated catalyst, and (b) thereafter restarting the flow of said first stream comprising at least one normal alkane and at least one chlorinated hydrocarbon while maintaining the flow of said second stream consisting essentially of hydrogen gas, and contacting said first stream and said second stream with said reactivated catalyst at said effective isomerization conditions.

5,463,167

MERCURY REMOVAL BY DISPERSED-METAL ADSORBENTS

John D. Y. Ou, Houston, Tex., assignor to Exxon Chemical Patents Inc., Linden, N.J.

Continuation of Ser. No. 52,849, Apr. 23, 1992, abandoned, which is a continuation of Ser. No. 790,852, Nov. 12, 1991, abandoned, which is a continuation of Ser. No. 504,464, Apr. 4, 1990, abandoned. This application Jan. 13, 1995, Ser. No. 372,695

Int. Cl.^{6} C07C *7/12;* **C10G** *17/00*

U.S. Cl. 585—823 **2 Claims**

1. A method of removing contaminants from a hydrocarbon stream comprising: contacting a hydrocarbon stream containing at least one contaminant comprising a heavy metal with a porous material capable of adsorbing said at least one contaminant under conditions suitable for adsorption of said contaminant by said porous material, wherein said material capable of adsorbing said heavy metal comprises a porous adsorbent comprising

(1) a support selected from the group consisting of crystalline aluminosilicates, amphorous aluminosilicates, alumina, silica, clay, zinc oxide, and mixtures of crystalline aluminosilicates, amphorous aluminosilicates, silica, clay, and metal oxides; and

(2) active metals dispersed on said absorbent wherein said active metals are selected from the group consisting of Ga, In, and Tl.

5,463,168

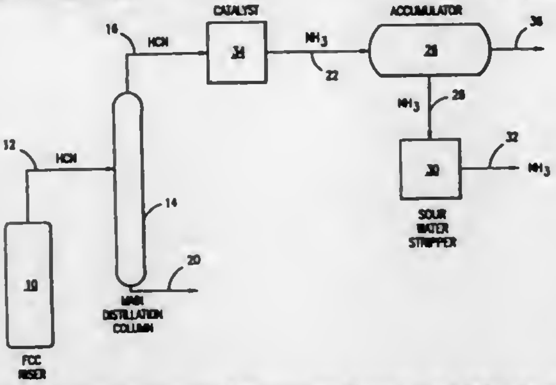
PROCESS FOR THE REMOVAL OF HYDROGEN CYANIDE FROM FCC HYDROCARBON PRODUCT GAS STREAMS

Costandi A. Audeh, Sun City West, Ariz.; David S. Shihabi, Pennington, N.J.; Richard F. Socha, Newtown, and Scott A. Stevenson, Langhorne, both of Pa., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed Aug. 17, 1994, Ser. No. 291,802

Int. Cl.^{6} C07C *7/00;* **C01C** *3/00;* **B01J** *8/00*

U.S. Cl. 585—854 **20 Claims**



1. A process for removing HCN from a hydrocarbonaceous gas stream comprising:

a) contacting a hydrocarbonaceous gas stream containing HCN with a catalyst selected from a member of the group consisting of MgO/SiO_2, SnO_2, Li_2O, and vanadia/titania in the presence of water;

b) allowing said gas to remain in contact with said catalyst under conditions and for a time sufficient to convert HCN to NH_3 while avoiding degradation or polymerization of olefinic hydrocarbons contained in said gas stream; and

c) separating said NH_3 and water from the hydrocarbonaceous gas stream substantially devoid of HCN.

5,463,169

PROCESS FOR DESTROYING PYROTECHNIC MATERIAL

Heinz Hebisch, Angermünde; Hans-Heinrich Brehmer, Geilmersdorf; Norbert Goltz, and Uwe Rothenstein, both of Schwedt, all of, Germany, assignors to Buck Werke GmbH & Co., Bad Überkingen, Germany

Filed Jun. 28, 1993, Ser. No. 83,375

Claims priority, application Germany, Jun. 29, 1992, 42 21 344.4

Int. Cl.^{6} C06D *5/06*

U.S. Cl. 588—202 **15 Claims**

1. A process for destroying pyrotechnical material comprising pyrotechnical material A which forms predominantly alkaline reaction products and pyrotechnic material B which forms predominantly acidic reaction products comprising the steps of:

I. subjecting pyrotechnic material A and pyrotechnical material B to combustion to produce crude gases;

II. cooling the combined crude gases to below 400° C.;

III. purifying the combined crude gases by at least one of the following means:

A. under dry conditions by feeding such gases first into a preliminary separator to separate coarse particles, and then through fine dust filters to separate finely divided solids; and

B. under wet conditions by passing the crude gases first through a rotary scrubber and then through one or more absorption units; and

IV. releasing the purified gas.

5,463,170

PROCESS FOR THE DEGRADATION OF HIGHLY TOXIC HALOGENATED ORGANIC COMPOUNDS CONTAINED IN GASES

Wedigo von Wedel, Paris, France; Hubertus Eickhoff, Alzenau, Germany; Manfred Weck, Alzenau, Germany; John Tarabocchia, Friedrichsdorf, Germany; Ulrich Schelbert, Alzenau, Germany, and Alexander Möller, Gelnhausen, Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Germany

Filed Feb. 18, 1994, Ser. No. 198,055

Claims priority, application Germany, Feb. 20, 1993, 43 05 344.0

Int. Cl.^{6} B01D *53/70*

U.S. Cl. 588—207 **21 Claims**

19. A process for the degradation of highly toxic halogenated organic compounds contained in a gas containing no SO_2 with a peroxy compound, said process comprising passing said gas over an inorganic solid contact catalyst in the presence of a peroxy compound to form a treated gas, wherein said peroxy compound is not Caro's acid (H_2SO_5) or salts thereof, wherein said halogenated organic compounds are polychlorinated dibenzodioxins and dibenzofurans, and wherein said passing is at a temperature above the dew point of said gas.

5,463,171

METHOD FOR SOLIDIFICATION OF WASTE, AND APPARATUS, WASTE FORM, AND SOLIDIFYING MATERIAL THEREFOR

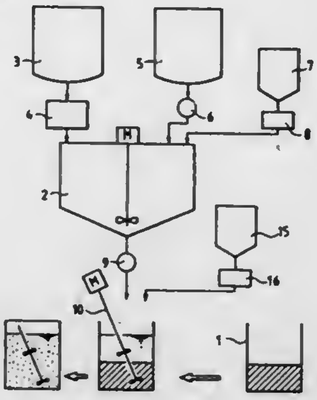
Takashi Nishi; Masami Matsuda; Kenji Noshita; Makoto Kikuchi, all of Hitachi; Tatsuo Izumida, Katsuta; Shin Tamata, Ooarai, and Yoshimasa Kiuchi, Katsuta, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 17, 1993, Ser. No. 123,359

Claims priority, application Japan, Sep. 18, 1992, 4-249937

Int. Cl.^{6} G21F *9/00*

U.S. Cl. 588—4 **17 Claims**



1. A method for solidifying radioactive waste comprising the steps of:

loading said radioactive waste including amphoteric metals into a solidifying vessel,

mixing solidifying material including hydraulic solidifying materials of cement group in a mixing vessel with an additive reagent for forming protective film to prevent generation of hydrogen gas at surface of said amphoteric metals and mixing water to produce a paste,

pouring said paste from the mixing vessel into said solidifying vessel loaded with said radioactive waste,

mixing the paste with the radioactive waste to form a uniform mixture within said solidifying vessel, and

allowing said mixture to stand for enough time to solidify said paste and to obtain a solidified body containing said radioactive waste.

5,463,172

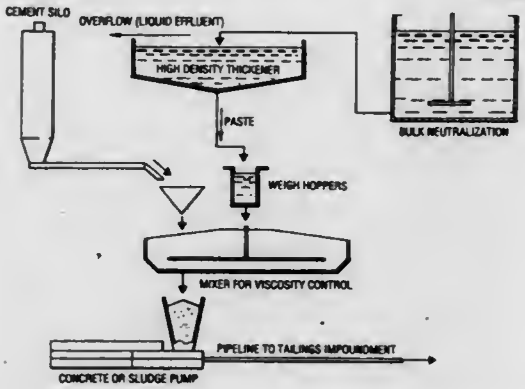
WASTE DISPOSAL PROCESS

Alain A. Marvy, Saskatchewan, Canada, assignor to Cigar Lake Mining Corporation, Saskatchewan, Canada

Filed Mar. 23, 1994, Ser. No. 216,727

Int. Cl.^{6} B09B *3/00*

U.S. Cl. 588—252 **15 Claims**



1. A method of disposing hazardous industrial solid waste which comprises:

a) treating the waste to form a pumpable paste having hydraulic properties of a Bingham fluid;

b) pumping the paste to a paste deposit site in a water saturated area, the paste deposit site having a bottom and comprising a body of standing water;

c) depositing the paste at a location above the bottom of the paste deposit site and under the standing water;

d) said water saturated area providing permanent water cover for the paste;

e) said paste being not readily mixable with the standing water at said deposit site, and said paste further providing control of release of contaminants into the environment.

5,463,173

INBRED CORN LINE PHR61

Loren J. Hoffbeck, Tipton, Ind., assignor to Pioneer Hi-Bred International, Inc., Des Moines, Iowa

Continuation-in-part of Ser. No. 649,800, Feb. 1, 1991, abandoned. This application Dec. 9, 1993, Ser. No. 164,586

Int. Cl.^{6} A01H *5/00;1/00;* C12N *5/04*

U.S. Cl. 800—200 **6 Claims**

1. Inbred corn seed designated PHR61 and having ATCC Accession No. 97123.

5,463,174

TRANSFORMATION AND FOREIGN GENE EXPRESSION IN BRASSICA SPECIES

Maurice M. Moloney, Calgary, Canada, and Sharon Radke, Davis, Calif., assignors to Calgene Inc., Davis, Calif.

Continuation of Ser. No. 395,131, Aug. 14, 1989, Pat. No. 5,188,958, which is a continuation of Ser. No. 54,187, May 26, 1987, abandoned, which is a continuation-in-part of Ser. No. 868,640, Mar. 29, 1986, abandoned. This application Sep. 11, 1992, Ser. No. 943,815

The portion of the term of this patent subsequent to Feb. 23, 2010, has been disclaimed.

Int. Cl.^{6} A01H *1/04;* C12N *5/00;15/00;* C12P *21/04*

U.S. Cl. 800—205 **29 Claims**

11. A transformed Brassica plant produced according to the method comprising:

co-cultivating a Brassica leaf or hypocotyl explant with disarmed *A. tumefaciens* comprising a plasmid containing an expression cassette joined to at least a right T-DNA border, whereby said expression cassette becomes integrated into the genome of cells in said Brassica explant to provide transformed oncogene-free cells, and wherein said expression cassette comprises a neomycin phosphotransferase II gene conferring kanamycin resistance;

transferring said explant to callus inducing medium comprising at least one auxin to allow callus to form on said explant;

transferring said callus to regeneration medium containing less than about 2% sucrose, or an organic caloric equivalent thereto, and comprising at least one milligram per liter of a cytokinin, and a means for selecting for transformed cells as a result of expression of said neomycin phosphotransferase II gene, whereby shoots comprising transformed cells are produced from said callus; and

transferring said shoots to a growing medium to produce plants.

5,463,175
GLYPHOSATE TOLERANT PLANTS

Gerard F. Barry, St. Louis, and Ganesh M. Kishore, Chesterfield, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 156,968, Nov. 23, 1993, abandoned, which is a continuation of Ser. No. 717,370, Jun. 24, 1991, abandoned, which is a continuation-in-part of Ser. No. 543,236, Jun. 25, 1990, abandoned. This application Feb. 21, 1995, Ser. No. 391,339

Int. Cl.^{6} C12N *5/14;15/53;15/82;* **A01H** *5/00*

U.S. Cl. 800—205 **30 Claims**

9. A glyphosate tolerant plant having inserted into its genome a recombinant, double-stranded DNA molecule comprising in sequence:

a) a promoter region which functions in plants to cause the production of an RNA sequence, operatively linked to;

b) a structural DNA sequence that causes the production of an RNA sequence which encodes a glyphosate oxidoreductase enzyme having the sequence of SEQ ID NO: 5, operatively linked to;

c) a 3' non-translated region which functions in plants to cause the addition of polyadenylated nucleotides to the 3' end of the RNA sequence;

where the promoter region is heterologous with respect to the structural DNA sequence and causes sufficient expression of said enzyme in plant tissue to enhance the glyphosate tolerance of a plant transformed with said gene.

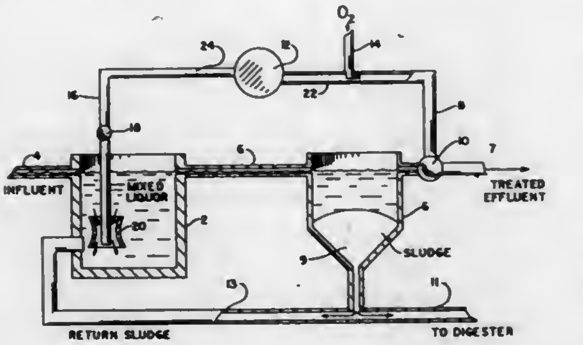
5,463,176
LIQUID WASTE OXYGENATION

C. Edward Eckert, 260 Lynn Ann Dr., New Kensington, Pa. 15068

Filed Jan. 3, 1994, Ser. No. 176,912

Int. Cl.^{6} C02F *3/22*

U.S. Cl. 210—622 **6 Claims**



1. An improved method for oxygenation of influent to a sewage treatment facility, comprising:

(a) providing a source of influent having a dissolved oxygen (DO) content of less than 3 mg/l;

(b) providing a low pressure stream comprising water having a DO content in the range of 0.5 to 20 mg/l;

(c) introducing an oxygen-containing gas through a nozzle to said low pressure stream to provide a mixture comprising water and gas, the gas being introduced at a velocity exiting said nozzle at supersonic conditions;

(d) pumping said mixture into a high pressure stream wherein the pressure is maintained in the range of 50 to 3000 psig to obtain an oxygen enriched dispersion having a DO content in the range of 15 to 175 mg/l, the pressure in said high pressure side being greater than the pressure in said low pressure stream; and

(e) discharging said oxygen enriched dispersion into said source of influent for purposes of oxygenation of said influent to increase the oxygen level in said influent to provide a mixed liquor having a DO content in the range of 1 to 20 mg/l.

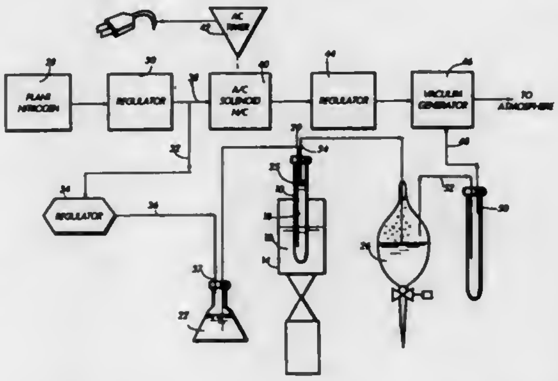
5,463,177
SOLVENT EXTRACTION PROCESS

John K. Youngs, Wilmington, N.C., assignor to General Electric Company, Schenectady, N.Y.

Filed Aug. 23, 1994, Ser. No. 294,584

Int. Cl.^{6} C22B *60/02;* **B01D** *11/00*

U.S. Cl. 423—10 **17 Claims**



1. A process for extracting uranium from a sample containing the uranium comprising the steps of:

disposing the sample containing the uranium in a vessel;

introducing a solvent in which the uranium is soluble adjacent the bottom of the vessel containing the sample with the uranium therein, the solvent being immiscible with respect to the sample and having a density less than the density of the sample;

applying ultrasonic energy to the sample containing uranium in the vessel to facilitate solubilization of at least a portion of the uranium in the solvent so that the solvent containing solubilized uranium rises through the sample toward the top of the vessel; and

removing the solvent containing the uranium from the vessel.

5,463,178
RECORDING SHEET AND PROCESS FOR ITS PRODUCTION

Shinichi Suzuki, and Hitoshi Kijimuta, both of Yokohama, Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Filed Jul. 15, 1994, Ser. No. 275,525

Claims priority, application Japan, Jul. 16, 1993, 5-198995

Int. Cl.^{6} B41M *5/00;1/36*

U.S. Cl. 428—216 **11 Claims**

1. A recording sheet comprising a substrate, a porous layer of pseudo-boehmite having a thickness of from 10 to 100 μm formed on the substrate and a layer of silica gel having a thickness of from 0.1 to 30 μm formed as the outermost layer on the porous layer of pseudo-boehmite.

5,463,179

SOLID ELECTROLYTE OBTAINED BY THE POLYMERIZATION OF DIACRYLATE MONOMER HAVING A RIGID ALKANE SEGMENT

Benjamin Chaloner-Gill, 520 Mansion Ct., #303, Santa Clara, Calif. 95054, and M. Neal Golovin, 8 Wensley Dale Ct., Owings Mills, Md. 21117

Filed Dec. 6, 1993, Ser. No. 162,746

Int. Cl.^{6} H01M *6/18*

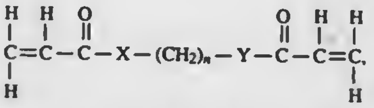
U.S. Cl. 429—192 **28 Claims**

1. A single phase, solid, solvent-containing electrolyte which comprises:

(a) solid polymeric matrix;

(b) an inorganic ion salt; and

(c) a solvent; wherein said solid polymeric matrix is obtained by polymerizing or copolymerizing an organic monomer represented by Formula (I):



$$\mathrm{H_2C{=}CH{-}C({=}O){-}X{-}(CH_2)_n{-}Y{-}C({=}O){-}CH{=}CH_2} \quad (I)$$

where X and Y are independently selected from S, NH, and NR where R is an alkyl group having 1 to 6 carbon atoms, and n is an integer of 3 to 18.

5,463,180

2,4-DICHOLOROPHENOXY ACETIC ACID REDUCED ODOR HERBICIDAL MIXTURE

Joe V. Gednalske, Riverfalls, Wis., and Robert W. Herzfeld, Stillwater, Minn., assignors to Cenex/Land O'Lakes Agronomy Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 881,473, May 11, 1992, Pat. No. 5,260,260. This application Nov. 5, 1993, Ser. No. 149,179

Int. Cl.^{6} A01N *39/04*

U.S. Cl. 504—323 **2 Claims**

1. A method for reducing odor in 2,4-dichlorophenoxy acetic acid, the method comprising:

providing an odor reducing effective amount of a nonionic surfactant blend having an effective quantity of an acidulated soybean soapstock and an effective quantity of nonoxynol; and

mixing the nonionic surfactant blend with 2,4-dichlorophenoxy acetic acid.

5,463,181

FARNESYL: PROTEIN TRANSFERASE INHIBITORS AS ANTICANCER AGENTS

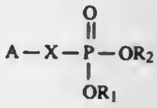
David M. Stemerick, Fairfield, Ohio, assignor to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Continuation of Ser. No. 21,411, Feb. 23, 1993, abandoned. This application Nov. 8, 1993, Ser. No. 148,188

Int. Cl.^{6} A61K *31/66;* **C07F** *9/38;9/40*

U.S. Cl. 514—125 **8 Claims**

1. A compound of the formula

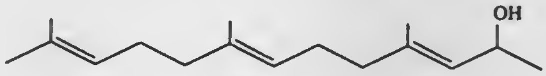


$$\mathrm{A{-}X{-}P({=}O)(OR_1){-}OR_2}$$

wherein X is CCl_2 or CF_2,

R_1 and R_2 are each independently H; C_1–C_4 alkyl; $(CH_2)_n$—Z, wherein n is the integer 0,1,2,3 or 4 and Z is phenyl or naphthyl, unsubstituted or substituted with from 1 to 3 substituents selected from the group consisting of C_1–C_4 alkyl, C_1–C_4 alkoxy, halogen, CF_3, OCF_3, OH, CN, NO_2 and NH_2; or a pharmaceutically acceptable cation, and

A is a radical selected from the group consisting of



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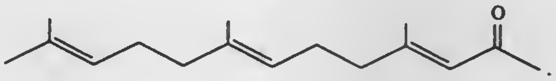

5,463,182

ESTERIFICATION OF CARBOXYLATE CONTAINING POLYMERS

Lewis E. Manring, Washington, W. Va., and Michael W. J. West, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 953,420, Sep. 29, 1992, Pat. No. 5,324,790. This application Sep. 21, 1993, Ser. No. 124,781

The portion of the term of this patent subsequent to Jun. 28, 2011, has been disclaimed.

Int. Cl.^{6} C08F *8/34*

U.S. Cl. 525—330.4 **10 Claims**

1. An aqueous based coating composition which comprises a polymer containing carboxylate groups wherein a counterion is an esterifying ammonium or sulfoxonium ion and water, and provided that said ammonium or sulfoxonium ion is substantially stable in the presence of water.

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95

MI

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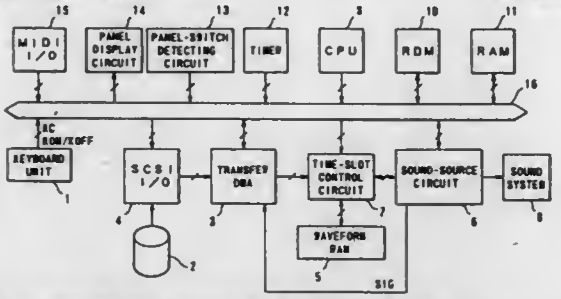
5,463,183

MUSICAL TONE FORMING APPARATUS

Fumitomo Konno, Hamamatsu, Japan, assignor to Yamaha Corporation, Japan
Filed Apr. 26, 1994, Ser. No. 233,381
Claims priority, application Japan, Apr. 27, 1993, 5-101557
Int. Cl.^{6} G10H *1/057;1/06;7/00*
U.S. Cl. 84—604 **9 Claims**



5. A musical tone forming apparatus comprising:

external storage means for storing plural sets of first and second waveform data, said first waveform data relating to an attack portion of a musical tone waveform, while said second waveform data relates to a remaining portion of the musical tone waveform, said second waveform data being divided into a plurality of data when being stored in said external storage means;

waveform memory means which provides an attack-waveform storage area and a buffer storage area, said attack-waveform storage area having a storage capacity which can store a plurality of said first waveform data, while said buffer storage area is provided to store said second waveform data such that said plurality of data are sequentially stored in said buffer storage area;

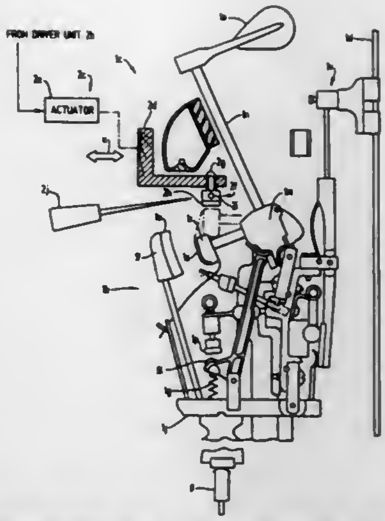
transfer means for transferring said plurality of said first waveform data, all of which are read from said external storage means, to said attack-waveform storage area before a production of the musical tone, whereas when a tone-generation instruction, which activates a musical tone to be generated, is given, said transfer means transfers said second waveform data, which corresponds to the tone-generation instruction and which is read from said external storage means, to said buffer storage area such that said plurality of data are sequentially transferred to said buffer storage area; and

musical-tone-signal forming means, activated when the tone-generation instruction is given, which selects one of said plurality of said first waveform data in accordance with the tone-generation instruction so that said first waveform data selected is used to form the attack portion of the musical tone signal at first, and then, the remaining portion of the musical tone signal is formed on the basis of said second waveform data whose plurality of data are sequentially read from said buffer storage area.

5,463,184

KEYBOARD INSTRUMENT HAVING A CATCHER STOPPER FOR SILENT OPERATION ON KEYBOARD

Kiyoshi Kawamura, Hamamatsu, Japan, assignor to Yamaha Corporation, Japan
Continuation of Ser. No. 158,768, Nov. 30, 1993, abandoned. This application Oct. 5, 1994, Ser. No. 318,201
Claims priority, application Japan, Jun. 3, 1993, 5-157934
Int. Cl.^{6} G10C *3/12;5/00;* **G10D** *15/00;* **G10H** *1/34*
U.S. Cl. 84—719 **10 Claims**



10. A keyboard instrument comprising:

a) an acoustic piano including

- a-1) a keyboard having a plurality of keys turnable with respect to a stationary board member, said plurality of keys being selectively depressed in both mechanical and electronic sound producing modes by a player,
- a-2) a plurality of key action mechanisms respectively coupled with said plurality of keys, and selectively actuated by said plurality of keys when said player depresses, said plurality of key action mechanisms having respective whippens functionally connected with said plurality of keys, respectively, respective catchers respectively projecting from butts and respective back checks respectively projecting from said whippens so as to be brought into contact with said catchers when said player releases the associated keys,
- a-3) a plurality of hammer mechanisms respectively associated with said plurality of key action mechanisms, and having respective hammer heads and said butts supporting said hammer heads, respectively, said plurality of key action mechanisms being driven for rotation by said plurality of key action mechanisms when said player selectively depresses said plurality of keys, and
- a-4) a plurality of strings associated with said plurality of hammer mechanisms, and struck by said hammers in said mechanical sound producing mode when the player selectively depresses said plurality of keys; and

b) a silence means having a movable stopper means associated with said catchers, and a driver unit responsive to an instruction of said player for driving said movable stopper means between a free position and a blocking position, said catchers being freely moved together with the associated butts without interruptions of said plurality of movable stoppers while said movable stopper means is staying in said free position, said catchers being brought into contact with said movable stopper means in said blocking position before the associated hammer heads strike said plurality of strings.

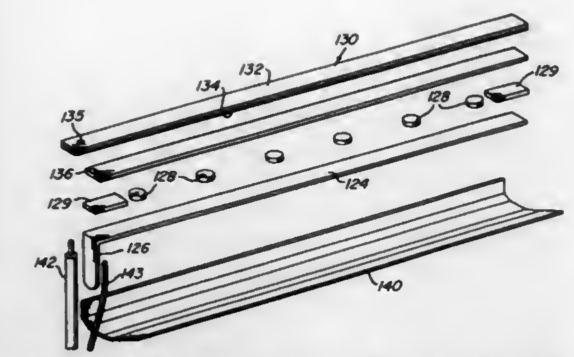
5,463,185

MUSICAL INSTRUMENT TRANSDUCER

Lawrence R. Fishman, 76 Grove St., West Medford, Mass. 02155
Division of Ser. No. 887,175, May 21, 1992, Pat. No. 5,319,153, which is a division of Ser. No. 642,398, Jan. 17, 1991, Pat. No. 5,155,285, which is a continuation-in-part of Ser. No. 552,984, Jul. 16, 1990, Pat. No. 5,029,375, which is a continuation-in-part of Ser. No. 251,570, Sep. 30, 1988, Pat. No. 4,944,209, which is a continuation-in-part of Ser. No. 876,238, Jun. 19, 1986, Pat. No. 4,774,867, which is a continuation-in-part of Ser. No. 856,189, Apr. 28, 1986, abandoned. This application Apr. 13, 1994, Ser. No. 227,074
The portion of the term of this patent subsequent to Mar. 1, 2005, has been disclaimed.
Int. Cl.^{6} G10H *3/18*
U.S. Cl. 84—731 **22 Claims**

17. An apparatus for use with a stringed musical instrument having a saddle and a plurality of strings, the apparatus for electrically coupling and shielding a piezoelectric transducer element, the apparatus comprising:

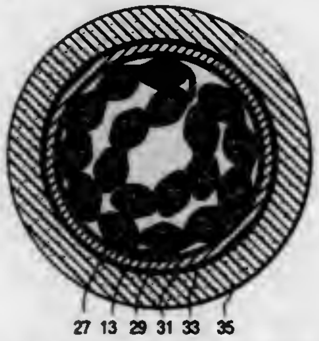
an elongated, flat, electrically conductive member;



- an elongated, flat, dielectric member having a conductive face, the material and the ground plane being spaced apart sufficiently to accommodate the piezoelectric transducer element, wherein the ground plane and the dielectric member have a length sufficient to extend under the plurality of strings;
- a first electrical lead electrically coupled to the ground plane; and
- a second electrical lead electrically coupled to the conductive face.

5,463,186
ROUND ELECTRICAL CABLE

Ulrich Schricker, Am Kreuzacker 13, D-91154 Roth, Germany
Filed Mar. 8, 1994, Ser. No. 208,456
Claims priority, application Germany, Mar. 8, 1993, 9303370 U
Int. Cl.⁶ H01B *7/08; 7/34*
U.S. Cl. 174—36 **18 Claims**



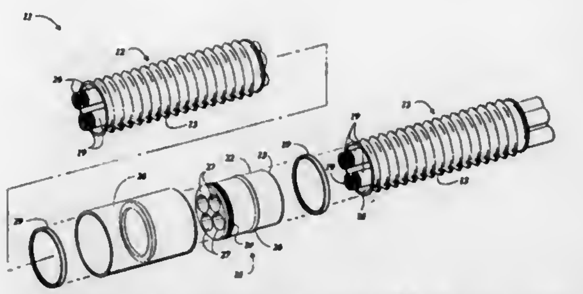
1. A round electrical cable formed from at least one ribbon cable which has been twisted into a round shape, and wherein the ribbon cable comprises a plurality of electrical conductor elements which are arranged adjacent to each other and held in place by a carrier tape of expanded polytetrafluoroethylene whereupon the conductor elements are arranged at a certain distance from each other at least on one side of the carrier tape and are attached to the carrier tape over a relatively small area of their outer circumference.

5,463,187
FLEXIBLE MULTI-DUCT CONDUIT ASSEMBLY

Mark Battle, Stone Mountain, Ga., assignor to The George Ingraham Corp., Stone Mountain, Ga.
Continuation of Ser. No. 953,862, Sep. 30, 1992, abandoned. This application Jun. 28, 1994, Ser. No. 267,836
Int. Cl.⁶ F16L *39/00*
U.S. Cl. 174—88 R **7 Claims**

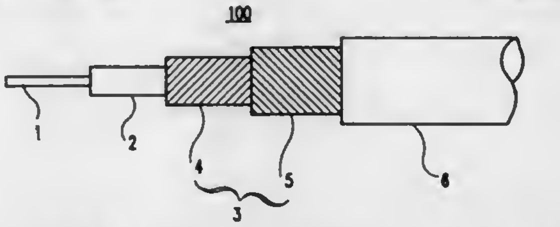
1. A flexible multi-duct conduit assembly for housing subterranean communications lines and protecting the lines from underground moisture and other corrosive elements, said conduit assembly comprising:

- a plurality of conduit sections joinable end-to-end with each conduit section comprising an elongated open ended outer casing having a plurality of open-ended flexible inner ducts disposed within and extending along the length of said outer casing;
- said outer casings having an interior surface and a circumferentially corrugated exterior surface to provide flexibility of said outer casings for bending the casings about an arc;
- means for coupling said outer casings together in mutually aligned end-to-end relationship comprising a collar surrounding and spanning the intersection between the aligned ends of adjacent outer casings;
- coupler means disposed within said outer casings at the junctions of adjacent conduit sections for aligning and coupling together the inner ducts to form continuous passageways extending along the length of said conduit assembly for receiving and housing communications lines; and
- at least one gasket at the junction between each conduit section and an adjacent joined conduit section, said gasket surrounding the end of at least one of said outer casings and being captured and compressed between said outer casing and said collar, said gasket being configured to nestle and be compressed between two adjacent corrugations of said outer casing to confine said gasket to its proper position on said outer casing and to provide a reliable water-tight seal against migration of water into any portion of said outer casing.



5,463,188
COAXIAL CABLE

Yasuhiro Nohmi, Tokyo; Tadashi Yamaguchi, Nagano; Kimio Matsuzawa, Nagano; Naoki Katagiri, Nagano, and Hotaka Sakaguchi, Nagano, all of, Japan, assignors to NEC Corporation, Tokyo, Japan
Filed May 31, 1994, Ser. No. 251,044
Claims priority, application Japan, Jun. 4, 1993, 5-134886
Int. Cl.⁶ H01B *7/34*
U.S. Cl. 174—108 **5 Claims**



1. A coaxial cable wherein an insulating layer, an outer conducting layer and a protective film layer are formed in that order around a center conductor, the outer conducting layer being formed from a primary transverse winding and a secondary transverse winding each of a plurality of thin metal wires, the winding directions of the two transverse windings being opposite each other, the winding angles of the primary transverse winding and secondary transverse winding being 30°±5° with respect to the center conductor, and the winding pitches of the primary transverse winding and secondary transverse winding being from 0.8 to 2.0 times a bending radius of the coaxial cable.

5,463,189

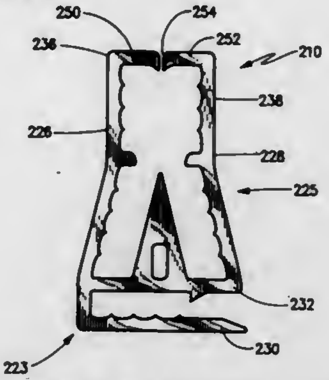
INSTALLATION CLIP DEVICE FOR ELECTRICAL CABLES

Bernard F. Deneke, 7946 S. Madison Way, Littleton, Colo. 80122; James W. Rumbold, 2006 Kelty Rd., Franktown, Colo. 80116, and Clark B. Scott, 5016 Tule Lake Dr., Littleton, Colo. 80123

Filed Dec. 23, 1993, Ser. No. 173,412

Int. Cl.^{6} H01B *17/00*

U.S. Cl. 174—138 G **28 Claims**



1. An installation clip device adapted for use with a first electrical cable that is mounted along a structural member so that at least one second electrical cable can be mounted therealong, comprising:

(a) a base member adapted to receive said first electrical cable whereby said base member becomes fastened directly to said first electrical cable and thereby indirectly secured to said structural member; and

(b) a clip structure disposed on said base member and operative to receive and retain said second electrical cable whereby said second electrical cable is indirectly secured along said structural member, said clip structure having a first and a second retaining arm, each of said first and second retaining arms extending outwardly from said base member and terminating in a respective first and second distal end portion, said first and second retaining arms oriented in an opposed, spaced-apart relationship to define a clip channel therebetween with the clip channel sized and adapted to receive said second electrical cable so that said first and second retaining arms are operative to retain said second electrical cable oriented within the clip channel along a clip channel axis thereof.

5,463,190

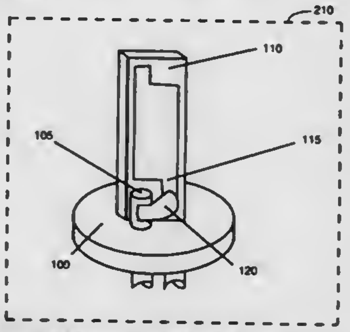
ELECTRICALLY CONDUCTIVE ADHESIVE

Robert T. Carson, Boynton Beach; Arnold W. Hogrefe, Ft. Lauderdale, and Frank J. Juskey, Jr., Coral Springs, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 4, 1994, Ser. No. 223,413

Int. Cl.^{6} H05K *1/00*

U.S. Cl. 174—259 **21 Claims**



1. A conductive adhesive, comprising:

a polymer having a predetermined curing temperature range;

a first conductive particulate material suspendable in said polymer for providing substantially uniform conductivity throughout the conductive adhesive; and

a second conductive particulate material suspendable in said polymer for metallurgically bonding together particles of said first particulate material;

wherein said first conductive particulate material comprises a mixture of one or more types of first metallic particles having a melting temperature above the curing temperature of said polymer.

5,463,191

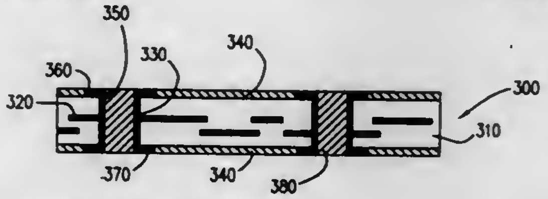
CIRCUIT BOARD HAVING AN IMPROVED FINE PITCH BALL GRID ARRAY AND METHOD OF ASSEMBLY THEREFOR

James S. Bell, Cedar Park, and Deepak Swamy, Austin, both of Tex., assignors to Dell USA, L.P., Austin, Tex.

Filed Mar. 14, 1994, Ser. No. 212,477

Int. Cl.^{6} H05U *1/00*

U.S. Cl. 174—263 **25 Claims**



1. A circuit board, comprising:

an insulating substrate, said substrate having a via therethrough;

a conductive layer located over said substrate, said via passing through said layer and laterally uninterrupted through said circuit board;

a first solder having a first melting point located within and substantially blocking said via; and

a second solder having a second melting point located over said blocked via, said second melting point lower than said first melting point, said first solder remaining substantially solid and preventing said second solder from substantially entering said via when said first and second solders are heated to a temperature between said first and second melting points.

5,463,192

PROCESS FOR OPERATING A MEASUREMENT INSTRUMENT, AND MEASUREMENT INSTRUMENT SUITABLE FOR USE WITH THIS PROCESS

Johannes Wirth, Zurich, Switzerland, and Mario Gallo, late of Zurich, Switzerland, assignors to Wirth Gallo Messtechnik AG, Zurich, Switzerland

PCT No. PCT/CH89/00207, § 371 Date May 10, 1993, § 102(e) Date May 10, 1993, PCT Pub. No. WO90/07101, PCT Pub. Date Jun. 28, 1990

PCT Filed Nov. 21, 1989, Ser. No. 555,443

Claims priority, application Switzerland, Dec. 14, 1988, 4618/88

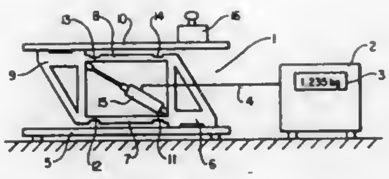
Int. Cl.^{6} G01G *19/40; 13/14*

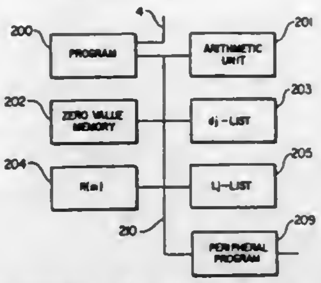
U.S. Cl. 177—25.14 **14 Claims**

1. Measuring apparatus with numerical evaluation device for measuring forces and masses which exhibits several measurement ranges and an automatic zero point correction, divided into a measuring part (1), which contains a force sensor (15) and a computer (2) with display apparatus (3), in which the force sensor (15) is connected to the computer (2) through a multilead cable (4), characterized by the fact that the computer (2) contains the following components:

an element (200) for storage of the control program of the computer (2) and for its control,

an arithmetic unit (201) for execution of the logic and arithmetic operations,





a zero value memory (**202**) for generation of the difference of successively determined zero values and for storage of the newest zero values corrected by the difference,

a memory (**203**) for storage of a list of all assigned display increments d_j,

an element (**204**) for generation of the result from the signals transmitted by the force sensor (**15**) and for generation of the result R(m) reduced by the content of the zero value memory (**202**) in computing increments m,

a memory (**205**) for storage of a list of all assigned maximum loads L_j, each limiting one measuring range,

a memory (**209**) for storage of control programs of peripheral connecting equipment,

a shift register (**206**) for storage of a number of results R(m) in the zero range, said shift register (**206**) has a capacity of ten results,

a clock (**207**) for measurement of a time t extending from a specified time defined in the procedure,

a read-only memory (**208**) for storage of a critical time t_{crit},

and by the fact that the listed elements (**200** through **209**) are connected to element (**200**) through a control and data line (**210**) for execution of the procedure in organized interaction with the elements (**200** through **209**).

5,463,193

VIBRATION ISOLATION MODULE

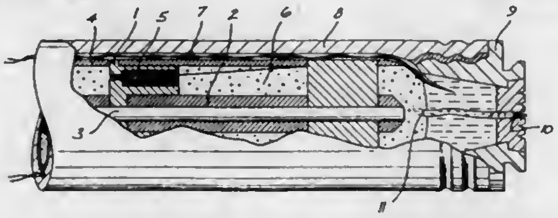
Allan L. Carpenter, Surrey Downs, and Mark W. Adkins, Mylore, both of, Australia, assignors to Australia Sonar Systems Pty Ltd, Technology Park, Australia

Filed Mar. 25, 1993, Ser. No. 36,707

Claims priority, application Australia, May 8, 1992, PL2301

Int. Cl.⁶ F16F *15/00*

U.S. Cl. 181—207 **11 Claims**



1. A vibration isolation module for minimizing the transmission of mechanical vibrations in an underwater structure, the vibration isolation module having two opposite ends, and comprising:

first and second attachment mechanisms located at said two opposite ends, respectively, and attached to respective parts of the underwater structure,

an elastic member connecting the first and second attachment mechanism said elastic member providing vibration isolation between the first and second attachment mechanisms,

a visco-elastic damper connecting the first and second attachment mechanisms, said visco-elastic damper attenuating the transmission of low frequency vibrations between the first and second attachment mechanisms,

a viscous damper located between the first and second attachment mechanism, said viscous damper attenuating the transmission of high frequency vibrations between the first and second attachment mechanisms,

a fluid-tight container which defines a fluid-tight enclosure and surrounds said elastic member, said visco-elastic damper and said viscous damper and

a plurality of masses spaced apart within said fluid-tight enclosure so as to divide said fluid tight enclosure into a plurality of sub-enclosures.

5,463,194

EXHAUST SYSTEM

Keith C. Ransom, South Benfleet, and Michael J. Southwell, Chelmsford, both of, United Kingdom, assignors to Ford Motor Company, Dearborn, Mich.

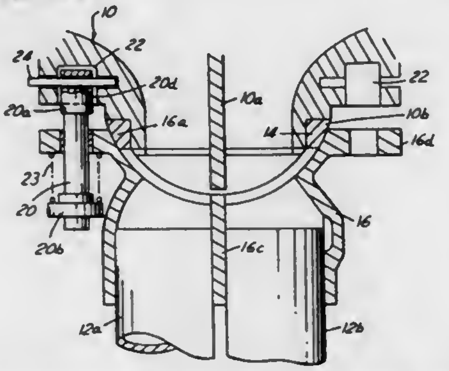
PCT No. PCT/GB90/01715, § 371 Date Mar. 27, 1992, § 102(e) Date Mar. 27, 1992, PCT Pub. No. WO91/07576, PCT Pub. Date May 30, 1991

PCT Filed Nov. 8, 1990, Ser. No. 856,143

Claims priority, application United Kingdom, Nov. 15, 1989, 8925842

Int. Cl.⁶ F01N *7/10;* F16L *27/04*

U.S. Cl. 181—240 **1 Claim**



1. An exhaust system for a motor vehicle internal combustion engine, having an exhaust manifold with a lower end and a down pipe with an upper end, in which the lower end of the exhaust manifold (**10**) and the upper end of the down pipe (**12*a*, 12*b***) each comprise two or more conduits which are sector shaped in cross section and wherein the down pipe is sealed against the manifold (**10**) by a ball joint having a pivotal centre and the down pipe (**12*a*, 12*b***) is spaced from the radial walls (**10*a***) of the manifold by a small gap sufficient to permit pivoting of the down pipe relative to the manifold, characterised in that the down pipe (**12*a*, 12*b***) is urged against the manifold (**10**) by clamping bolts (**20**) having heads which are pivotable relative to the manifold about an axis passing through the pivotal centre of the flexible ball joint.

5,463,195

KEY SWITCH

Makoto Watanabe, Nagoya; Isao Mochizuki, Kaizu; Yoshitsugu Sato, Kuwana; Takeyuki Takagi, Nagoya, and Hiroaki Okada, Kasugai, all of, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Dec. 23, 1993, Ser. No. 172,259

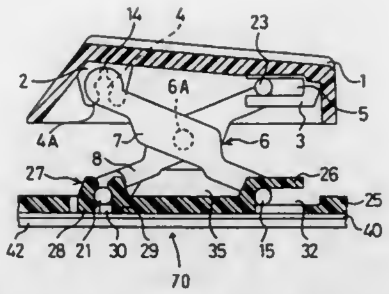
Claims priority, application Japan, Jan. 6, 1993, 5-00685; Feb. 5, 1993, 5-018711

Int. Cl.⁶ H01H *3/12*

U.S. Cl. 200—5 A **20 Claims**

1. A key switch, comprising:

a key top having a face on which characters may be presented and a reverse face at the opposite side of said face having a mounting portion thereon;



a guide support having a first hinge member and a second hinge member pivotally attached to one another to operate in a scissors like manner, a first end of said first hinge member mounted to said opposite face of said key top and a second end of said second hinge member mounted to said opposite face of said key top;

a holder plate mounting a second end of said first hinge member and a first end of said second hinge member, and

a switching member between said key top and said holder plate which is actuated by movement of said key top toward said holder plate, wherein said holder plate has an elastically deformable mounting member for engaging and retaining a one of said second end of said first hinge member and said first end of said second hinge member.

5,463,196

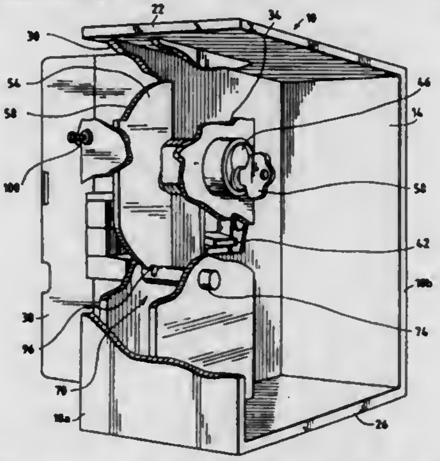
CAPTURED KEY ELECTRICAL SAFETY LOCKOUT SYSTEM

Daniel E. Darimont, Aurora, Ill., assignor to Universities Research Association, Inc., Washington, D.C.

Filed Apr. 16, 1993, Ser. No. 48,986

Int. Cl.^{6} H01H *9/28*

U.S. Cl. 200—43.16 19 Claims



1. A safety lockout apparatus for an electrical circuit comprising:

an electrical switch movable between an ON position at which the electrical circuit is energized and an OFF position at which the electrical circuit is deenergized;

a key;

a lock being adapted to receive said key, said lock being rotatable among a plurality of positions by said key, said key only being insertable and removable when said lock is at a preselected position, said lock being maintained in said preselected position when said key is removed from said lock;

a blocking member driven by said lock between a first position at which said electrical switch is movable between its ON and OFF positions and a second position at which said blocking member physically maintains said electrical switch in its OFF position, whereby said blocking member second position corresponds to said preselected position at which said key can be removed from and inserted into said lock;

a plunger movable between a first position at which said plunger engages said blocking member and maintains said blocking member in its first position and a second position at which said plunger is disengaged from said blocking member to permit movement of said blocking member; and

bias means for normally biasing said plunger to its first position.

5,463,197

APPARATUS AND METHOD FOR FORMING WIRE BONDING BALL

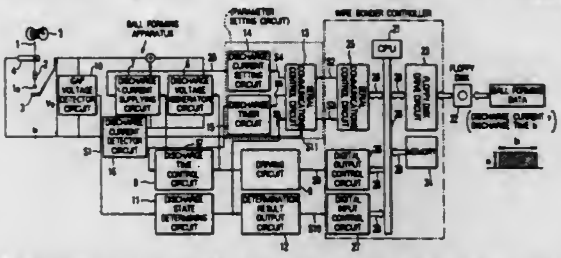
Naoki Miyazaki, Fukuoka, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 10, 1994, Ser. No. 258,574

Claims priority, application Japan, Jun. 30, 1993, 5-162810

Int. Cl.^{6} B23K *11/16*

U.S. Cl. 219—56.22 11 Claims



8. A method for controlling formation of a ball at the end of a wire in a spark discharge comprising:

establishing in digital form parameters for controlling a spark discharge between an electrode and an end of a wire, the parameters including digital discharge current data indicative of a controlled discharge current flowing between the electrode and the wire in a spark discharge;

converting the digital discharge current data into an analog discharge current control signal for controlling the discharge current in a spark discharge; and

using the analog discharge current control signal, controlling the current flowing between an electrode and a wire in a spark discharge to produce a ball at an end of the wire.

5,463,198

SWITCHING DEVICE

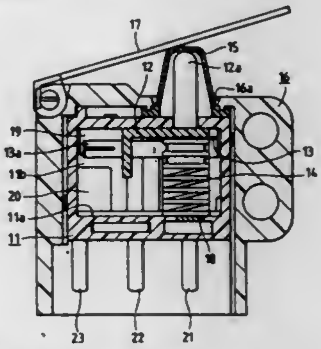
Manabu Shimaoka, Furukawa, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Jun. 9, 1994, Ser. No. 257,591

Claims priority, application Japan, Jun. 15, 1993, 5-143650

Int. Cl.^{6} H01H *13/12*

U.S. Cl. 200—531 6 Claims



1. A switching device comprising:

a case including a lower wall, a side wall connected to the lower wall, and an upper wall connected to the side wall, the upper wall defining an opening;

a first fixed contact embedded in an inner surface of the lower wall, the first fixed contact being electrically connected to a first lead extending from the case;

a second fixed contact embedded in an inner surface of the side wall and having a contact surface coplanar therewith, the second fixed contact being electrically connected to a second lead extending from the case;

a third fixed contact embedded in the inner surface of the side wall and having a contact surface coplanar therewith such that the third fixed contact is located between the lower wall and the second fixed contact, the third fixed contact being electrically connected to a third lead extending from the case;

a slider movably mounted in the case, the slider including a projection extending through the opening defined by the upper wall;

a movable contact fixed to the slider, the moveable contact including an arm disposed to contact the second fixed contact when the slider is in a first vertical position relative to the upper wall, and to contact the third fixed contact when the slider is in a second vertical position relative to the upper wall;

a conductive spring located between the lower wall and the slider for biasing the slider away from the lower wall, the spring having a first end electrically connected to the moveable contact and a second end electrically connected to the first fixed contact.

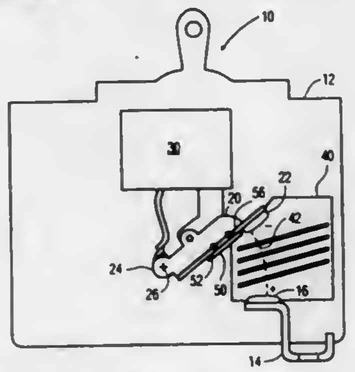
5,463,199
DC-RATED CIRCUIT BREAKER WITH ARC SUPPRESSOR

Gregory T. DiVincenzo, Easton, and Stefan Gabrielson, Salisbury, both of Md., assignors to Philips Electronics North America Corporation, New York, N.Y.

Filed May 28, 1993, Ser. No. 69,958

Int. Cl.^{6} H01H *33/04*

U.S. Cl. 218—158 **13 Claims**



1. A circuit breaker comprising:

a case,

a movable contact and an other contact within said case, forming an electrical switch,

an arc chute disposed within said case, adjacent said other contact,

a movable contact arm supporting said movable contact,

mounting means for mounting said movable contact arm for movement between a closed position and an open position, and

an operating mechanism for pivoting said movable contact arm, characterized in that the circuit breaker further comprises an arc suppressor and means for fixing said arc suppressor on a movable surface adjacent the movable contact, said arc suppressor remaining adjacent the movable contact during movement of the movable contact, and said arc suppressor facing said other contact and the arc chute at least when the contact arm is in the open position,

the arc suppressor consists of a flat plate and at least one integral mounting stud protruding from one face of the flat plate and passing through a corresponding hole in said surface for fixing said flat plate on said surface, the at least one integral mounting stud forming part of the means for fixing, and

at least the flat plate is formed from a substantially homogeneous material having a high melting temperature and dissipation factor, and containing absorbed water releasable upon exposure of the arc suppressor to intense heat from an arc resulting from interruption of a short circuit current.

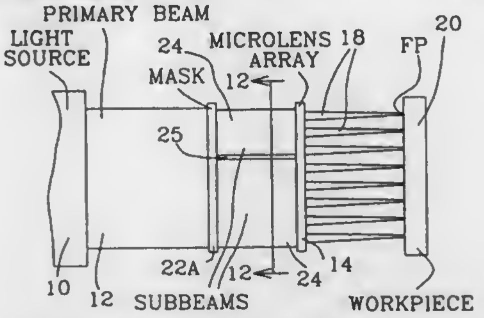
5,463,200
MARKING OF A WORKPIECE BY LIGHT ENERGY

Douglas J. James, Ottawa; Kenneth J. Andrews, Stettsville, and Terrence J. McKee, Nepean, all of, Canada, assignors to Lumonics Inc., Kanata, Canada

Filed Feb. 11, 1993, Ser. No. 16,262

Int. Cl.^{6} B23K *26/06*

U.S. Cl. 219—121.68 **16 Claims**



1. A method of marking a workpiece in a selected pattern with light energy from a primary light beam, comprising the steps of:

(a) transmitting to the workpiece portions of the light of the primary beam required to produce marks on the workpiece, while at least partially attenuating or redirecting the remainder of the light of the primary beam, and

(b) converting at least such mark-producing portions of the primary beam into a plurality of individual beamlets, said converting step including focusing each beamlet independently of the other beamlets;

said transmitting and converting steps being performed separately and sequentially with either said transmitting step preceding said converting step or said converting step preceding said transmitting step, the beamlets corresponding to said mark-producing light portions forming respective marks on the workpiece that are disposed in an array corresponding to the selected pattern;

including adjusting the location of the workpiece along the beamlets in order to vary the size and energy density of each beamlet at the workpiece substantially without changing the overall size of said selected pattern.

5,463,201
SEAM-TRACKING APPARATUS FOR A WELDING SYSTEM EMPLOYING AN ARRAY OF EDDY CURRENT ELEMENTS

Kristina H. V. Hedengren, and Kenneth B. Haefner, both of Schenectady, N.Y., assignors to Generla Electric Company, Schenectady, N.Y.

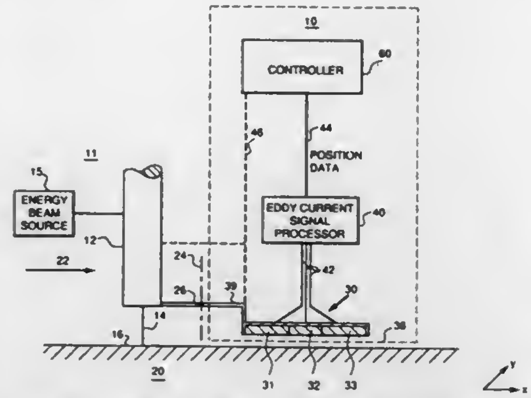
Filed Feb. 4, 1993, Ser. No. 13,601

Int. Cl.^{6} B23K *26/00;15/00;* **G01N** *27/90*

U.S. Cl. 219—121.83 **22 Claims**

1. A seam-tracking apparatus for a welding system in which an advancing welding arm directs at least one energy beam toward a tightly jointed seam having a varying curvature that is between at least a pair of abutting workpieces to be welded, said seam-tracking apparatus comprising:

an unitary eddy current sensor supported forwardly of said advancing welding arm, said unitary eddy current sensor comprising a plurality of spatially correlated eddy current elements forming an array having successive rows of said eddy current elements, said successive rows positioned wherein each of said eddy current elements in each of the successive rows are spatially staggered a predetermined distance from each other and staggered in a direction perpendicular to the varying curvature of the tightly joined seam, each of said eddy current elements in each of the successive



rows producing an electrical signal in response to being positioned adjacent to said tightly joined seam;

an eddy current signal processor connected to each of said eddy current elements in the array to receive and to process each of said electrical signals, said eddy current signal processor generating position data indicative of the current location of said tightly joined seam in accordance with the processed electrical signals; and

a controller connected to said eddy current signal processor, said controller responsive to said position data for aligning said unitary eddy current sensor between said pair of abutting workpieces wherein at least a portion of said eddy current elements in the array is continuously positioned over the varying curvature of said tightly joined seam, and for aligning said welding arm over said tightly joined seam wherein energy beams directed from said welding arm continuously and directly impinge on the varying curvature of said tightly joined seam.

5,463,202

LASER MACHINING APPARATUS AND METHOD

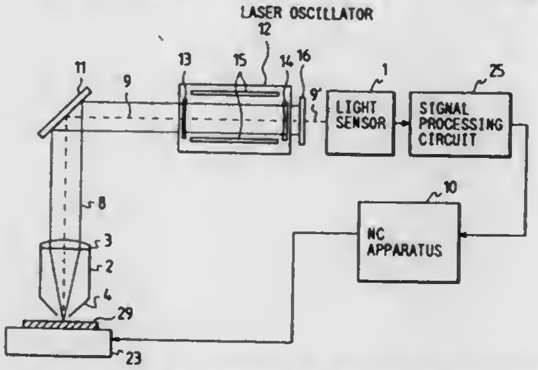
Miki Kurosawa; Shuji Ogawa; Masayuki Sugahara, all of Aichi; Kiyoshi Funai, Hyogo; Takashi Yumura, Hyogo, and Tetsu Yamamoto, Hyogo, all of, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 15, 1993, Ser. No. 120,829

Claims priority, application Japan, Dec. 28, 1992, 4-348438; Feb. 15, 1993, 5-025277

Int. Cl.^{6} B23K *26/00*

U.S. Cl. 219—121.83 **25 Claims**



1. A laser machining apparatus having an optical system for shaping a laser beam generated by a laser oscillator for irradiation onto a workpiece and machining the workpiece with the laser beam at machining points, said machining resulting in the generation at a machining point of a secondary light, the laser oscillator having a resonator comprising a plurality of mirrors, comprising:

first means for directing said secondary light into said resonator for application to at least one of said mirrors;

secondary light directing means for directing said secondary light from a position inside said resonator to a location outside of said resonator; and

a secondary light sensor for detecting said secondary light directed by said second directing means.

5,463,203

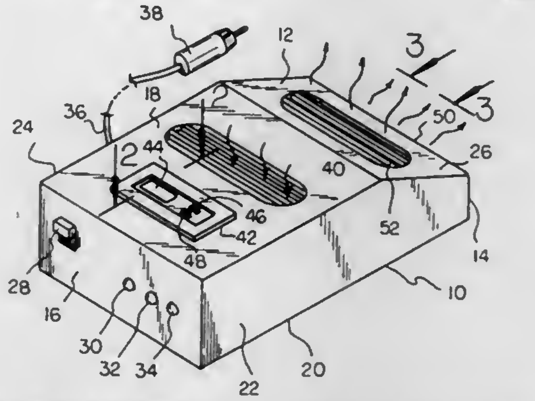
VEHICLE HEATER

John R. Moore, 713 Benton Ave., El Dorado, Kans. 67042

Filed Jun. 14, 1993, Ser. No. 75,388

Int. Cl.^{6} H05B *1/02*

U.S. Cl. 219—202 **7 Claims**



1. A vehicle heater adapted to be plugged into a cigarette lighter of a car, comprising:

an adapter able to be connected to a battery of the car through the cigarette lighter;

a heater and fan circuit;

a heater activator/deactivator circuit connected to the adapter for receiving voltage from the battery of the car heater and fan circuit for supplying voltage to the heater and fan circuit;

a switch, having an on and off position, connected to the heater activator/deactivator circuit for supplying voltage to the heater activator/deactivator circuit when the switch is in the on position;

a battery;

a clock connected between the battery and the heater activator/deactivator circuit;

a battery sensor connected to the heater activator/deactivator circuit for sensing the voltage level supplied to the heater activator/deactivator circuit;

a first indicator light connected to the battery sensor for indicating a low voltage is being supplied to the heater activator/deactivator circuit upon receipt of a signal from the battery sensor;

a temperature sensor connected to the heater activator/deactivator circuit for sensing outside air temperature;

a second indicator light connected to the temperature sensor for indicating when the temperature of the air is above a predetermined temperature upon receipt of a signal from the temperature sensor;

a third indicator light connected to the switch for indicating the switch is in the on position and the vehicle heater is operational upon receipt of a signal from the switch;

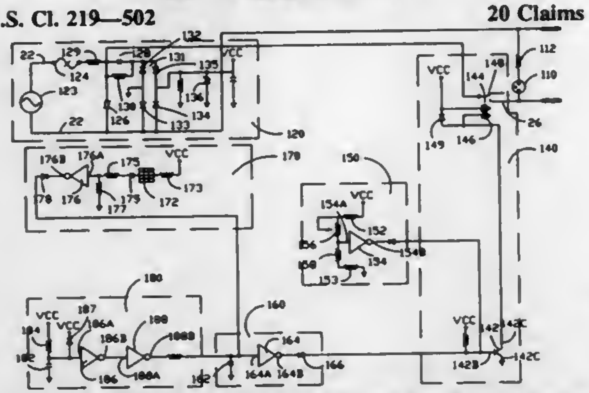
wherein the heater and fan circuit comprises a fuse for receiving voltage from the heater activator/deactivator circuit, and a heating coil connected to the fuse for receiving the voltage delivered to the fuse and heating air within the circuit upon receipt of the voltage.

5,463,204

Patent Not Issued For This Number

5,463,205
PHOTOSENSITIVE SWITCHING APPARATUS FOR AN ELECTRIC APPLIANCE

John C. K. Sham, Hong Kong, and Fan Kai Leung, Pok Fu Lam, both of, Hong Kong, assignors to Pentalpha Enterprises Ltd., Aberdeen, Hong Kong
Continuation-in-part of Ser. No. 245,964, May 19, 1994. This application Sep. 7, 1994, Ser. No. 301,685
Int. Cl.^{6} H05B *1/02;17/96*
U.S. Cl. 219—502 **20 Claims**



1. An automatic switching apparatus for supplying electrical power to an electric appliance, said appliance including means for coupling said switching apparatus to a source of electrical power, said switching apparatus comprising:

a) a drive circuit switchable between an activated state for electrically connecting said appliance to said source of electrical power and a deactivated state for electrically disconnecting said appliance from said source of electrical power; and

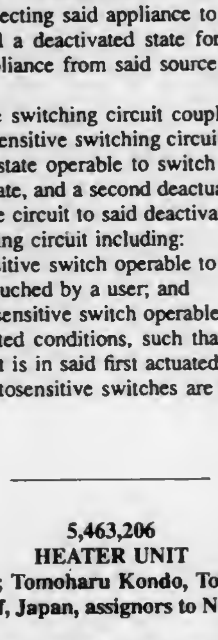
b) a photosensitive switching circuit coupled to said drive circuit, said photosensitive switching circuit switchable between a first actuated state operable to switch said drive circuit to said activated state, and a second deactuated state operable to switch said drive circuit to said deactivated state, said photosensitive switching circuit including:

i) a first photosensitive switch operable to be actuated when at least partially touched by a user; and

ii) a second photosensitive switch operable to be actuated when exposed to lighted conditions, such that said photosensitive switching circuit is in said first actuated state when said first and second photosensitive switches are simultaneously actuated.

5,463,206
HEATER UNIT

Fumio Abe, Handa; Tomoharu Kondo, Toki, and Yuuji Deguchi, Nagoya, all of, Japan, assignors to NGK Insulators, Ltd., Japan
Filed Nov. 16, 1992, Ser. No. 977,289
Claims priority, application Japan, Nov. 21, 1991, 3-305190
Int. Cl.^{6} H05B *3/14*
U.S. Cl. 219—553 **9 Claims**



1. A heater unit comprising:

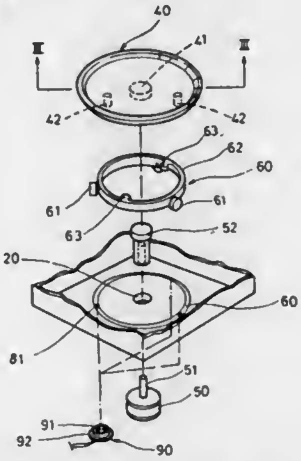
a resistance adjusting type heater including a honeycomb structure having an outer periphery and a large number of passages, at least two electrodes provided on the honeycomb structure to enable electrical heating of the honeycomb structure, and a resistance adjusting means provided between the electrodes;

at least one protective member covering at least part of the outer periphery of the resistance adjusting type heater, said at least one protective member being secured to said resistance adjusting type heater by an inorganic adhesive; and

a metallic casing for holding the resistance adjusting type heater.

5,463,207
WEIGHT SENSING APPARATUS OF A MICROWAVE OVEN HAVING A TURNTABLE

Kwang S. Kang, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea
Filed Jan. 10, 1995, Ser. No. 370,986
Claims priority, application Rep. of Korea, Feb. 28, 1994, 94-3783
Int. Cl.^{6} H05B *6/68;6/78*
U.S. Cl. 219—708 **4 Claims**



1. A weight sensing apparatus of a microwave oven comprising:

a turntable which supports a foodstuff to be cooked and is rotated by a driving motor;

a support member which comprises a ring-shaped body and a plurality of guide rollers that are connected to the outer circumference of said body, and supports said rotating turntable;

a ring-shaped groove for forming a track to guide the circular motion of said guide rollers, which includes one or more through holes disposed at regular intervals;

at least one or more weight sensors comprising a sensing element and a piezoelectric element, that can sense the weight of the foodstuff in such a manner that the upper portion of each said sensing element extends above said through holes and is pressed down by said circulating guide rollers;

a connecting means which is positioned between said turntable and said support member for rotating the guide rollers and the turntable at a same speed,

whereby said guide rollers of said support member rotate at the same speed as that of said turntable along the circular track of said groove by the action of said connecting means, and then press down said sensing elements of said weight sensors projecting above said through holes, so that the weight of the foodstuff is sensed quickly and correctly.

5,463,208

TASK PROCESSING APPARATUS

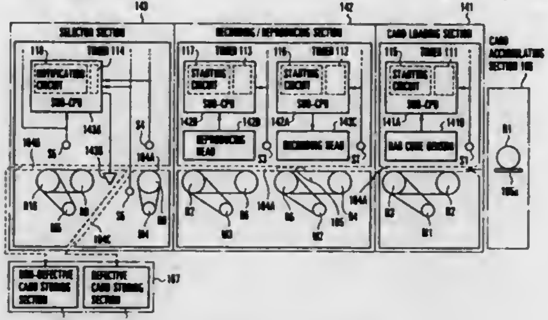
Hiroshi Sasou; Tomoki Kaya; Tosiaki Watanabe, and Shinji Fukaya, all of Tokyo, Japan, assignors to Tamura Electric Works, Ltd., Tokyo, Japan

Filed Mar. 18, 1994, Ser. No. 210,324

Claims priority, application Japan, Mar. 19, 1993, 5-083828

Int. Cl.^{6} G06F *15/46;* **G06K** *17/00*

U.S. Cl. 235—380 **7 Claims**



1. A task processing apparatus comprising:

a main CPU for managing a series of different tasks processing, the main CPU having first timer means for setting a processing interval of the series of tasks;

a plurality of sub-CPUs for independently executing a series of different tasks set in advance in accordance with a predetermined sequence;

first starting means, arranged in said main CPU, for outputting a first starting signal for starting a first sub-CPU, of said plurality of sub-CPUs, which executes a first task at the start of the series of tasks;

second starting means, arranged in each of said sub-CPUs except for a last sub-CPU, for, when a task in a given sub-CPU is completed, outputting a second starting signal for starting a next sub-CPU which executes a next task, each of said sub-CPUs including second timer means which has a timer time slightly longer than that of said first timer and is started in response to the second starting signal, said first starting means of said main CPU periodically outputting the first starting signals to said first sub-CPU on the basis of timer time outputs from said first timer means, and each of said sub-CPUs detecting an abnormality in a preceding sub-CPU when the second starting signal from said preceding sub-CPU does not arrive within the timer time of said second timer means; and

notification means, arranged in said last sub-CPU of said plurality of sub-CPUs, for supplying a processing completion signal indicating completion of the series of tasks to the main CPU when the last task is completed.

5,463,209

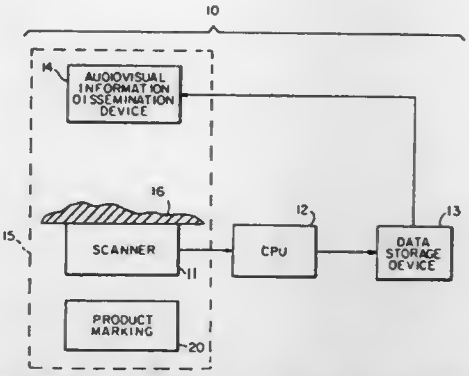
POINT-OF-SALE PRODUCT INFORMATION DISSEMINATION ARRANGEMENT AND METHOD

Jack Figh, Guttenberg, and Robert V. Cuddihy, Jr., Basking Ridge, both of N.J., assignors to HMG Worldwide In-Store Marketing, Inc., New York, N.Y.

Continuation of Ser. No. 158,517, Nov. 29, 1993, abandoned. This application Feb. 3, 1995, Ser. No. 384,607

Int. Cl.^{6} G06K *15/00*

U.S. Cl. 235—383 **5 Claims**



1. A product information system for providing any customer present at a point-of-display location, at which a group of products is displayed for sale, with information about a selected product of the group in response to a customer-initiated request, each product in the group having associated therewith an optically distinguishable, product identifying indicia, the system comprising:

data storage means including a storage medium having a plurality of individual portions each dedicated to storing product-related data representative of an audiovisual information segment relating to a particular product of the group;

means for entering the customer-initiated request, including an optical scanner positionable at the point-of-display location in such a manner as to enable any customer intending to initiate a request by positioning the selected product with the indicia in scanning registration therewith, said optical scanner including means for scanning the product identifying indicia, and for producing an addressing signal corresponding to a request for information about the selected product;

means responsive to said addressing signal for retrieving data corresponding to the selected product from said storage medium and for issuing driving signals as representations of such retrieved data; and

means for presenting at the point of display location audiovisual information as dictated by driving signals, whereby a customer contemplating the purchase of a selected product may view an audiovisual presentation providing information about that selected product.

5,463,210

IC CARD READER

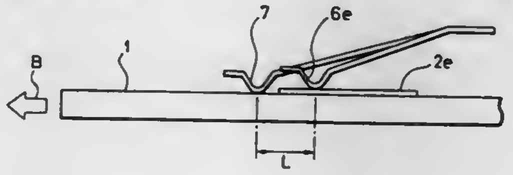
Shigeru Imura, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

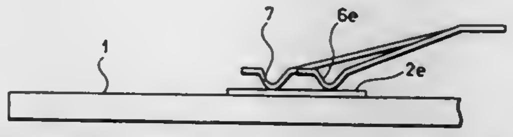
Filed Oct. 22, 1993, Ser. No. 141,886

Claims priority, application Japan, Jan. 28, 1992, 4-290236

Int. Cl.^{6} G06K *7/06;* **H01R** *3/00*

U.S. Cl. 235—441 **3 Claims**





1. An IC card loading detecting apparatus for reading an IC card, comprising:

an IC card including a central processing unit (CPU) housed therein and a plurality of input/output terminal portions for transmitting and receiving a signal between said CPU circuit and an interface unit of an equipment;

means for detecting a presence of said IC card by electrically contacting a detection sensor contact provided on said interface unit to a ground terminal of said input/output terminal portions, wherein said detection sensor contact is brought in contact with said ground terminal of said input/output terminal portions together with a ground contact of said interface unit to thereby detect the presence of said IC card.

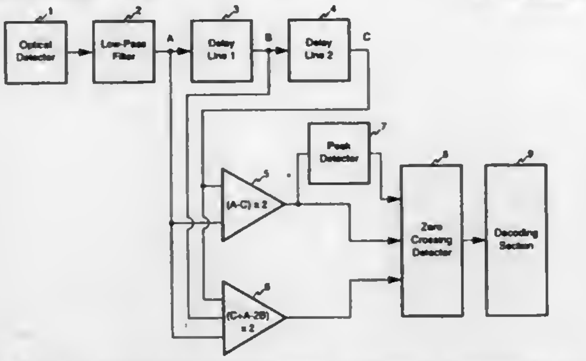
5,463,211

METHOD AND APPARATUS FOR DETECTING TRANSITIONS IN A TIME SAMPLED INPUT SIGNAL

Thomas C. Arends, and Randy D. Elliott, both of Eugene, Oreg., assignors to Spectra-Physics Scanning Systems, Inc., Eugene, Oreg.

Filed May 7, 1993, Ser. No. 58,659
Int. Cl.^{6} G06K *7/10*

U.S. Cl. 235—462 **41 Claims**



10. An apparatus for determining the occurrence of transitions in an input signal comprising:

- an optical scanner for generating an input signal from a scanned bar code label,
- a four-pole transitional Gaussian 12-dB filter for filtering said input signal,
- a double differentiator for generating an approximate second derivative of the filtered input signal, said double differentiator having relatively constant group delay over an expected input frequency range,
- a single differentiator for generating an approximate first derivative of the filtered input signal, said single differentiator having relatively constant group delay over the expected input frequency range, and
- a detection circuit for detecting zero crossings of said approximate second derivative indicative of transitions in the input signal, said detection circuit further comprising a thresholding circuit for establishing a threshold signal, whereby said detection circuit detects a valid transition of the input signal when a zero crossing of said approximate second derivative occurs during a period when said approximate first derivative exceeds said threshold signal.

5,463,212

LATENT IMAGE FORMING MEMBER AND METHOD OF MANUFACTURING, LATENT IMAGE READING APPARATUS AND LATENT IMAGE READING SYSTEM

Toshio Oshima, Toride; Tsunemi Ohiwa, Osaka; Masato Nishida, Kyoto; Taiji Matsumoto, Takatsuki; Akihiko Itoh, Uji, and Yoji Takeuchi, Toride, all of, Japan, assignors to Hitachi Maxell, Ltd., Osaka, Japan

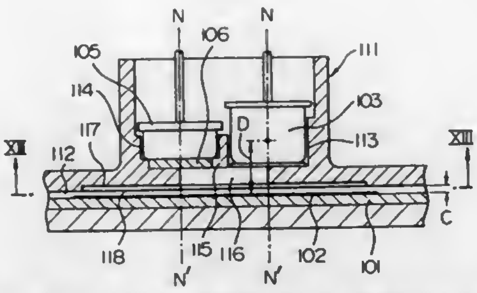
PCT No. PCT/JP93/00596, § 371 Date Jan. 4, 1994, § 102(e) Date Jan. 4, 1994, PCT Pub. No. WO93/22147, PCT Pub. Date Nov. 11, 1993

PCT Filed May 7, 1993, Ser. No. 170,270

Claims priority, application Japan, May 7, 1992, 4-114841; Jun. 24, 1992, 4-166316; Sep. 8, 1992, 4-239629
Int. Cl.^{6} G06K *7/10*

U.S. Cl. 235—468 **18 Claims**

1. A latent image forming member comprising a base, and an information indication layer on said base having a latent image pattern thereon in which fluorescent grains are dispersed and held, so that said information indication layer when irradiated with light having a predetermined wavelength excites said fluorescent grains, and information of light emitted from said fluorescent grains is optically read, wherein reflectance of a surface of said base with respect to light having said predetermined wavelength is 20% or higher, and



- a projection amount of said information indication layer from a top surface of said base is restricted to a range of from 0.5 to 20 μm, and a protection sheet is disposed which is laminated onto said base to cover the entire surface of said information indication layer and which permits light having said predetermined wavelength to pass therethrough.

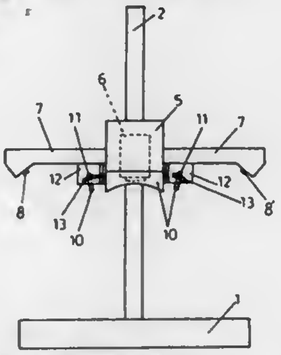
5,463,213

CODE MARK READER

Takafaru Honda, 1-1530-1 Kaijincho Minami, Funabashi-Shi; Chiba-ken, Japan

Filed May 3, 1994, Ser. No. 237,487
Int. Cl.^{6} G06K *7/10*

U.S. Cl. 235—468 **19 Claims**



1. A code mark reader comprising:

- a stage on which an object to be read can be placed,
- an infrared camera disposed in a focus adjustable manner above said stage, and
- two laser beam irradiators disposed on opposite sides of said camera and facing downwards toward said stage in an oblique manner such that one laser beam provides a first spot of light on said stage elongated in a first direction and the other laser beam simultaneously provides a second spot of light on said stage elongated in a second direction substantially perpendicular to said first direction and intersecting said first spot of light in a criss-cross manner at a position coincidental with a focus point of said camera on said stage.

5,463,214

APPARATUS FOR OPTIMIZING THROUGHPUT IN DECODED-OUTPUT SCANNERS AND METHOD OF USING SAME

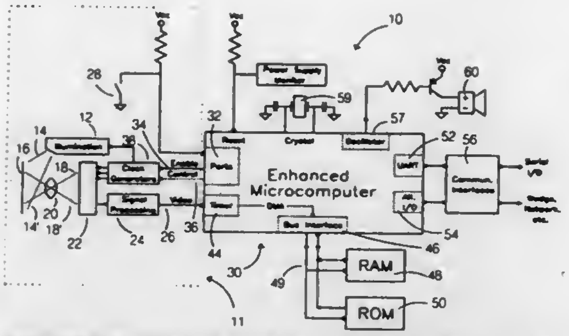
Andrew Longacre, Jr., Skaneateles; Robert M. Hussey, Syracuse, and John M. Pidhirny, Skaneateles, all of N.Y., assignors to Welch Allyn, Inc., Skaneateles Falls, N.Y.

Filed Mar. 4, 1994, Ser. No. 205,539
Int. Cl.^{6} G06F *7/10*

U.S. Cl. 235—472 **8 Claims**

1. In a scanner whose scanning action is capable of being stopped and started instantly, and having associated therewith a microprocessor for controlling the scanner in its performance of a scanning process, the improvement comprising:

- scanning means for scanning a target containing indicia to obtain information therefrom;



initiating means for triggering said scanning means, said scanning means being responsive to a signal from said initiating means;

first memory means for retaining information transferred therein from said scanning means during a first scan;

completion indicating means responsive to a signal from said scanning means, for determining that the first scan is completed;

decoding means, responsive to said completion indicating means, for decoding information from the completed first scan;

halting means, responsive to said completion indicating means, for preventing initiation of a subsequent scan by said scanning means; and

second memory means for retaining information transferred therein from said scanning means during a second scan wherein said scanning means and said decoding means are simultaneously operable.

5,463,215

DEVICE FOR ALIGNING THE AXIS OF A LIGHT BEAM WITH THE AXIS OF AN OPTICAL FIBER

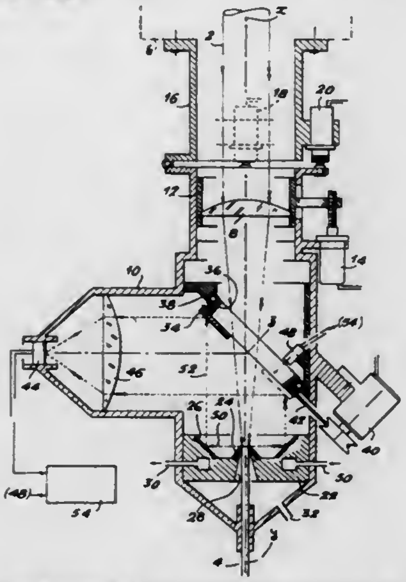
Jean-Pascal Alfille, Clamart, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Nov. 3, 1993, Ser. No. 145,242

Claims priority, application France, Nov. 13, 1992, 92 13660

Int. Cl.^{6} H01J *210/14;* B23K *26/04*

U.S. Cl. 250—206.1 **10 Claims**



1. Device for aligning an axis (x) of a light beam with a working axis (y), said device comprising:

sample taking means and detection means for sampling a peripheral part of the light beam along a circle having a center on the working axis (y) and for detecting the sample light to analyze the angular distribution of the corresponding light intensity, the angular distribution being uniform when the axis of the light beam coincides with the working axis.

5,463,216

IMAGE SENSOR

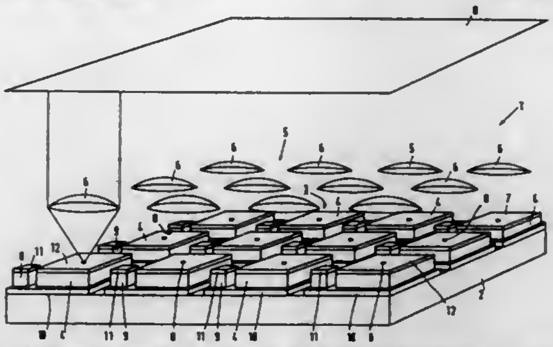
Cornelis Van Berkel, Hove, Brighton, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 21, 1994, Ser. No. 185,429

Claims priority, application United Kingdom, Jan. 25, 1993, 9301405

Int. Cl.^{6} H01L *27/14;* H01J *40/14*

U.S. Cl. 250—208.1 **13 Claims**



1. An image sensor comprising an insulating substrate carrying an array of discrete photosensitive elements each having a given surface area capable of detecting light and an array of lens elements provided over the photosensitive array so that each lens element is associated with a respective photosensitive element for concentrating light incident on the lens element onto the associated photosensitive element, characterized in that the given surface area of each photosensitive element is covered by an opaque layer for preventing light from reaching the photosensitive element and in that a respective light transmissive region which is small in relation to the surface area of the photosensitive element is provided in the opaque layer over each photosensitive element at or near the focal point of the associated lens element so that, for each photosensitive element, the majority of the given surface area is shielded from any incident light by the opaque layer and the light transmissive region defines within the given surface area of the photosensitive element a surface portion for receiving light which is small in relation to the given surface area.

5,463,217

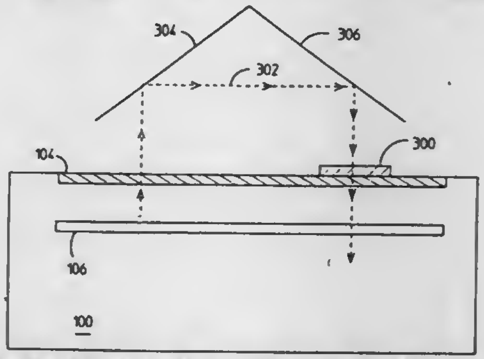
ADAPTER FOR SCANNING TRANSPARENCIES WITH A REFLECTIVE DOCUMENT SCANNER

Robert E. Sobol, Fort Collins; Steven L. Webb, Loveland, and David W. Boyd, Greeley, all of Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation-in-part of Ser. No. 112,832, Aug. 26, 1993, abandoned. This application Nov. 22, 1994, Ser. No. 343,279

Int. Cl.^{6} H01J *3/14;* H04N *1/40*

U.S. Cl. 250—234 **35 Claims**



1. An adapter for a reflective scanner, the reflective scanner having an internal light source, a reflective image area, and a transparency image area that is smaller than the reflective image area and contained within the reflective image area, the adapter comprising:

a reflector, wherein when the adapter is placed onto the reflective scanner, some of the light from the internal light source that passes through the reflective image area but outside the transparency image area is redirected by the reflector through the transparency image area and back into the reflective scanner.

5,463,218

DETECTION OF VERY LARGE MOLECULAR IONS IN A TIME-OF-FLIGHT MASS SPECTROMETER

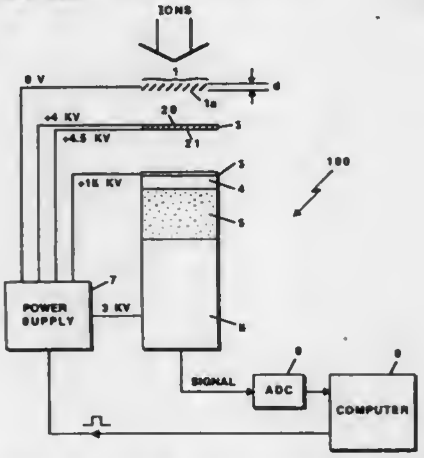
Armin Holle, Oyten, Germany, assignor to Bruker-Franzen Analytik GmbH, Bremen, Germany

Filed May 19, 1994, Ser. No. 245,958

Claims priority, application Germany, May 19, 1993, 43 16 805.1

Int. Cl.^{6} H01J *49/26*

U.S. Cl. 250—281 **22 Claims**



1. A method for detecting heavy molecular ions with masses greater than 10,000 atomic mass units and energies greater than 8 keV in a time-of-flight mass spectrometer having a flight tube, comprising:

a) converting the heavy organic ions which pass through the flight tube of the spectrometer, into lighter, secondary particles consisting of positive and negative light ions and electrons, by impingement of the heavy ions on a venetian blind type conversion dynode with a maximum thickness of two millimeters;

b) accelerating a unipolar fraction of the lighter secondary particles towards a single microchannel plate located parallel to and not more than three millimeters from the conversion dynode by applying a first potential difference between the conversion dynode and a front side of the microchannel plate;

c) converting, on impingement of the surface of the microchannel plate, the accelerated secondary particles into electrons:

d) multiplying the number of electrons inside the microchannel plate, by applying a second potential difference between the front side of the microchannel plate and a back side of the microchannel plate;

e) accelerating electrons from the microchannel plate towards a scintillator by applying a second potential difference between the back side of the microchannel plate and the scintillator;

f) Converting the electrons to photons with the scintillator; and

g) measuring the photons with a photomultiplier.

5,463,219

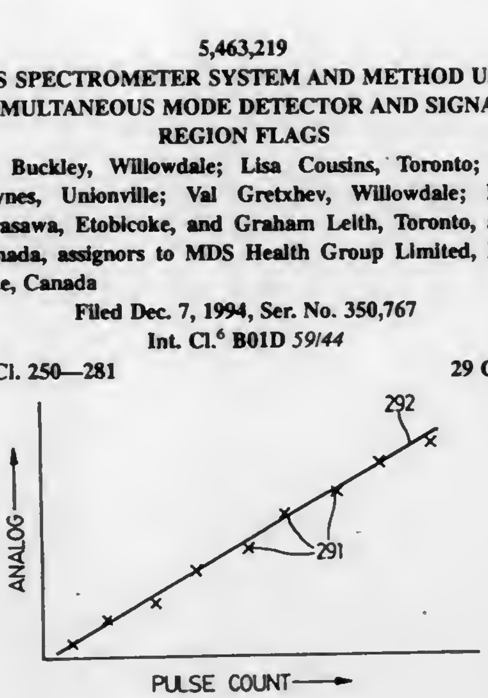
MASS SPECTROMETER SYSTEM AND METHOD USING SIMULTANEOUS MODE DETECTOR AND SIGNAL REGION FLAGS

Peter Buckley, Willowdale; Lisa Cousins, Toronto; Todd Daynes, Unionville; Val Gretxhev, Willowdale; Drake Hirasawa, Etobicoke, and Graham Leith, Toronto, all of, Canada, assignors to MDS Health Group Limited, Etobicoke, Canada

Filed Dec. 7, 1994, Ser. No. 350,767

Int. Cl.^{6} B01D *59/44*

U.S. Cl. 250—281 **29 Claims**



1. A mass analyzer system comprising:

(a) a mass analyzer for scanning through a plurality for points in a mass spectrum and for dwelling at each point;

(b) an ion lens,

(c) means for directing ions through said ion lens and into said mass analyzer,

(d) a simultaneous mode electron multiplier detector coupled to said mass analyzer for detecting ions passing therethrough,

(e) said detector comprising first and second dynode stages, and a plurality of electrodes including an analog signal electrode for providing an analog signal and a pulse counting electrode for providing a pulse count signal,

(f) logic means including first and second comparator means coupled to one of said electrodes for receiving an indication of the level of said analog signal, said first comparator means being responsive to a predetermined level of said analog signal to disable said pulse count signal, said second comparator means being responsive to a second and higher level of said analog signal for reducing the number of ions incident on said detector for disabling both said analog and said pulse count signals,

(g) said signals defining a first region in which at least one of said pulse count signal and said analog signal is valid, a second region in which only said analog signal is valid, and a third region in which neither said analog nor said pulse count signal is valid,

(h) said logic means including means responsive to the region in which said signals are located for producing a first flag when said signals are in said first region, a second flag when said signals are in said second region, and a third flag when said signals are in said third region, said flags being different from each other,

(i) memory means,

(j) and means for transmitting to and storing in said memory means the values of said signals and their associated flags for each dwell of said mass analyzer.

5,463,220

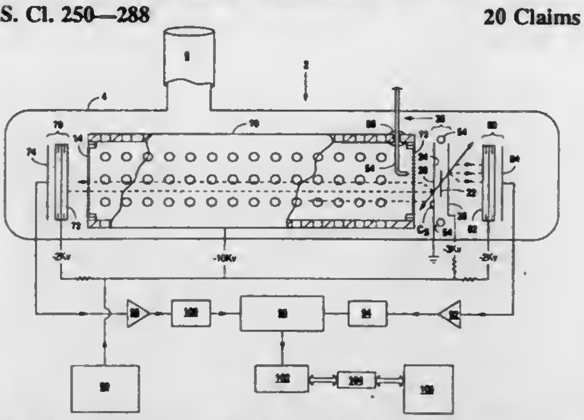
TIME OF FLIGHT MASS SPECTROMETER, ION SOURCE, AND METHODS OF PREPARING A SAMPLE FOR MASS ANALYSIS AND OF MASS ANALYZING A SAMPLE

David T. Young; Jill A. Marshall, both of San Antonio; Emile A. Schweikert, Bryan, all of Tex., and Melvin A. Park, Alexandria, Va., assignors to Southwest Research Institute, San Antonio, Tex.

Continuation of Ser. No. 935,039, Aug. 25, 1992, Pat. No. 5,360,976. This application Oct. 28, 1994, Ser. No. 331,210

Int. Cl.^{6} H01J *49/04*

U.S. Cl. 250—288 **20 Claims**



1. In a mass spectrometer wherein a quantity of sample to be mass analyzed is deposited onto a surface, an ion source comprising:

a. a sample inlet tube for directing a gaseous sample toward the surface under reduced pressure; and,

b. means for cooling the surface to low enough temperature to condense molecules of the gaseous sample onto the surface.

5,463,221

ELECTRON BEAM MEASURING APPARATUS

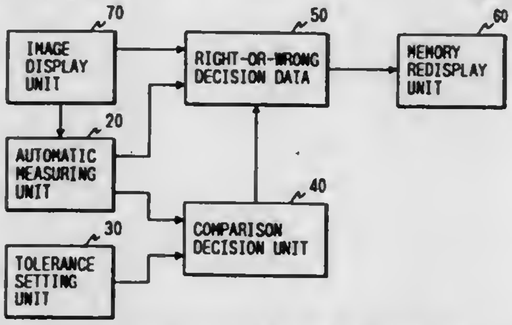
Tadashi Otaka; Hiroyoshi Mori, both of Katsuta, and Hideo Todokoro, Tokyo, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 23, 1994, Ser. No. 216,288

Claims priority, application Japan, Mar. 23, 1993, 5-086904

Int. Cl.^{6} H01J *37/28*

U.S. Cl. 250—310 **8 Claims**



1. An electron beam measuring apparatus comprising:

a measuring unit for measuring the dimensions of a magnified image of an object being examined with an electron beam so as to produce measured results;

a tolerance range setting unit for setting a range of tolerance for dimensions;

a comparison-decision unit for comparing said measured results with the range of tolerance set by said tolerance range setting unit and for deciding whether the measured results fall within said range of tolerance or not;

a right-or-wrong decision data memory for storing decision data to be used in judging whether the decision by said comparison-decision unit is right or wrong when the measured results have been found by said comparison-decision unit to be outside said range of tolerance; and

a redisplaying unit connected with the right-or-wrong decision data memory for redisplaying the right or wrong decision data on an image display unit.

5,463,222

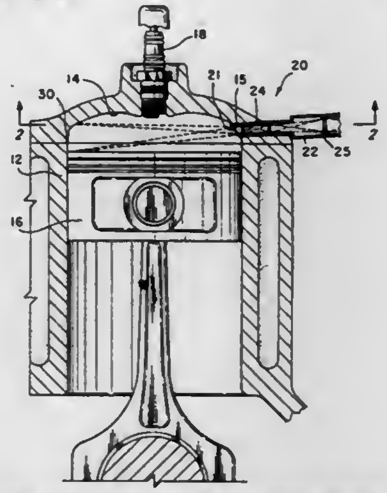
THERMAL IMAGING SYSTEM FOR INTERNAL COMBUSTION ENGINES

Jon M. Lesko, Arvada; Larry L. Brown, Lakewood, and James A. Keller, Englewood, all of Colo., assignors to Colorado Seminary, Denver, Colo.

Filed Jan. 24, 1994, Ser. No. 185,506

Int. Cl.^{6} G01J *5/00*

U.S. Cl. 250—330 **18 Claims**



1. A thermal imaging system for use in an internal combustion engine having a cylinder with a wall and a hole extending through said wall into said cylinder, said thermal imaging system comprising:

a lens;

an optical housing having an internal passageway with a distal portion for insertion into said hole in said cylinder wall and for supporting said lens to provide a field of view within said cylinder and project an image of said field of view through said internal passageway; and

camera means for receiving and recording said image provided by said optical housing; and

means for removably securing said distal portion of said optical housing to said hole in said cylinder wall.

5,463,223

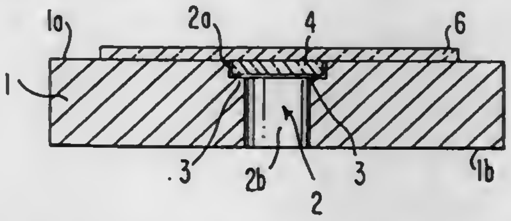
DISPOSABLE ALL PURPOSE MICRO SAMPLE HOLDER

Mag K. Wong, and Patrick T. T. Wong, both of Ottawa, Canada, assignors to Patwong Technologies, Inc., Ottowa, Canada

Filed Jan. 24, 1994, Ser. No. 185,456

Int. Cl.^{6} G01N *21/01*

U.S. Cl. 250—339.12 **20 Claims**



1. An infrared absorption spectra recording sample holder comprising:

a rigid frame substantially planar in shape having a bore passing from a first surface to a second surface thereof, said frame being substantially opaque to infrared light to be used in spectroanalysis of a sample and substantially unreactive to the sample to be analyzed;

an optical window having a size and shape and being mounted to said frame so as to cover the bore, said optical window being comprised of a material substantially transparent to the infrared light to be used in the spectroanalysis of the sample; and

a flexible film having a size and shape and being mounted to said first surface of said frame so as to cover the bore, said film being comprised of a material substantially transparent to the infrared light to be used in the spectroanalysis of the sample.

5,463,224

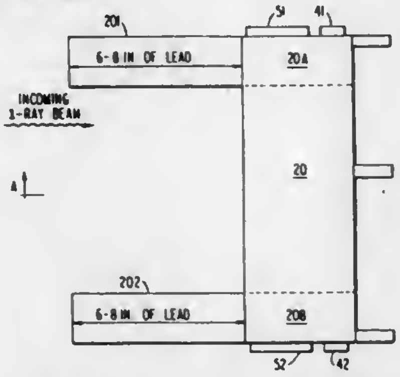
X-RAY DETECTOR SUITED FOR HIGH ENERGY APPLICATIONS WITH WIDE DYNAMIC RANGE, HIGH STOPPING POWER AND GOOD PROTECTION FOR OPTO-ELECTRONIC TRANSDUCERS

Paul Burstein, Winchester; Allen S. Krieger, Lexington, and Klaus Kubierschky, North Reading, all of Mass., assignors to American Science and Engineering, Inc., Cambridge, Mass.

Filed Jul. 1, 1986, Ser. No. 880,630

Int. Cl.^{6} G01T *1/202*

U.S. Cl. 250—366 **17 Claims**



1. An x-ray detector for high energy applications and having protection for opto-electronic transducers comprising:

a) a solid scintillating crystal having a front face exposed to x-ray energy directed along an axis generally perpendicular to said front face, said solid scintillating crystal having a thickness, along said axis chosen to provide a desirable stopping power in relation to an intensity of said x-ray energy,

b) a first opto-electronic transducer located outside a direct path of said x-ray energy and shielded from scattered x-ray energy by a relatively long dimension of said solid scintillating crystal, said first opto-electronic transducer located in light coupling relation with a face of said solid scintillating crystal generally perpendicular to said front face, and

c) a second opto-electronic transducer located outside a direct path of said x-ray energy and shielded from scattered x-ray energy by said solid scintillating crystal, said second opto-electronic transducer located in light coupling relation with a face of said solid scintillating crystal generally perpendicular to said front face, said second opto-electronic transducer having a gain distinctly different from a gain of said first opto-electronic transducer wherein presence of said first and second opto-electronic transducers extends a dynamic range of said x-ray detector.

5,463,225

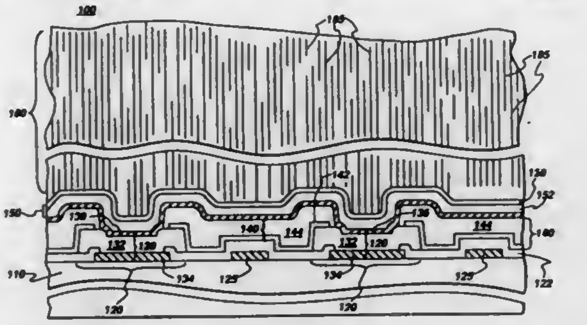
SOLID STATE RADIATION IMAGER WITH HIGH INTEGRITY BARRIER LAYER AND METHOD OF FABRICATING

Robert F. Kwasnick; Ching-Yeu Wei, and Jack D. Kingsley, all of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 891,117, Jun. 1, 1992, Pat. No. 5,233,181. This application Jul. 29, 1993, Ser. No. 99,370

Int. Cl.^{6} H01L *31/055;27/146*

U.S. Cl. 250—370.11 **17 Claims**



1. A solid state imager comprising:

a photosensor array having an upper conductive layer disposed substantially thereover, said upper conductive layer having an undulating surface topography corresponding to the contour of the underlying photosensor array components;

a photosensor array barrier layer comprising a first stratum disposed over said upper conductive layer, and a second stratum disposed over said first stratum, said first stratum comprising silicon oxide and said second stratum comprising silicon nitride, said barrier layer having a shape conforming to the underlying conductive layer and having a maximum thickness of less than about 3 μm; and

a scintillator disposed over said photosensor array barrier layer and optically coupled to said photosensor array through said barrier layer;

said first stratum providing a robust moisture barrier and said second stratum providing an adhesion bonding surface for said scintillator.

5,463,226

ELECTROMAGNETIC WAVE DETECTING APPARATUS

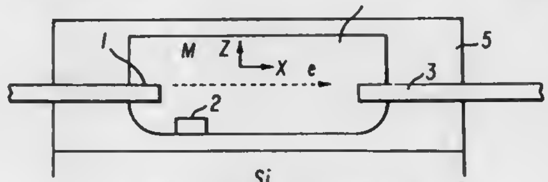
Kazuo Matsuzaki, and Akira Amano, both of Kawasaki, Japan, assignors to Fuji Electric Co., Ltd., Japan

Filed Jul. 7, 1994, Ser. No. 271,458

Claims priority, application Japan, Jul. 22, 1993, 5-180530

Int. Cl.^{6} G01J *5/10*

U.S. Cl. 250—374 **5 Claims**



1. An electromagnetic wave detecting apparatus comprising:

an electron emitting means including a cold cathode for emitting electrons;

an electron capturing means including an anode for capturing electrons attracted thereto from said cathode through evacuated space;

a magnetic field application means including an electromagnet that can vary an excitation current thereof for applying in said evacuated space a magnetic field orthogonal to an electric field applied between said cathode and said anode; and

a sealing means for sealing a dilute gas in said evacuated space.

5,463,227

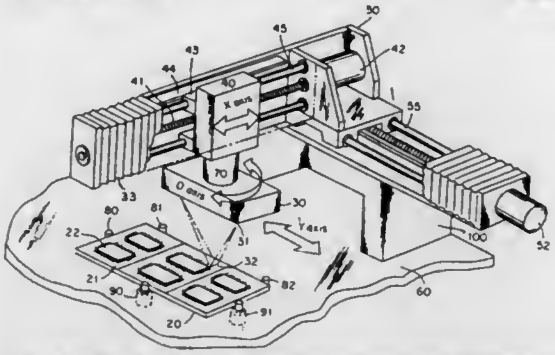
METHOD FOR OBTAINING THREE-DIMENSIONAL DATA FROM MULTIPLE PARTS OR DEVICES IN A MULTI-POCKETED TRAY

Howard Stern, Greenlawn; William Yonescu, Dix Hills; Joseph Vaiana, Miller Place, and Alex Mauro, Wheatley Heights, all of N.Y., assignors to Robotic Vision Systems, Inc., Hauppauge, N.Y.

Filed Jun. 24, 1992, Ser. No. 903,524

Int. Cl.^{6} G01N *21/00;21/86*

U.S. Cl. 250—559.29 **3 Claims**



1. A method for obtaining three-dimensional data from devices having corresponding sides, comprising the steps of: providing a multi-pocketed tray with tray pockets arranged in rows and columns; scanning sequentially with at least one three-dimensional sensor corresponding sides of said devices in a row or column; and repeating said scanning step for all rows and columns containing sides of said devices from which data is to be obtained.

5,463,228

APPARATUS FOR THE DETECTION OF A FLUID PHASE BOUNDARY IN A TRANSPARENT MEASURING TUBE AND FOR THE AUTOMATIC EXACT METERING OF AN AMOUNT OF LIQUID

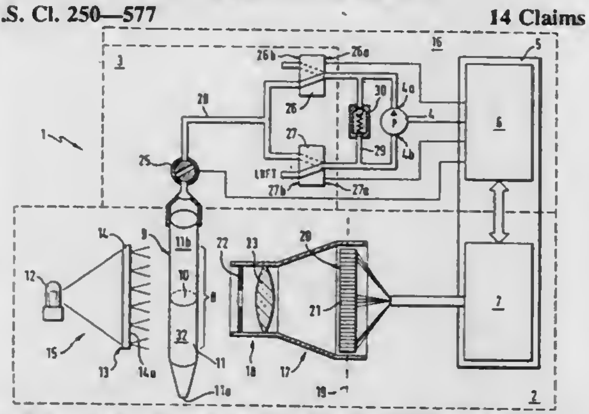
Friedemann Krause, Feldafing, Germany, assignor to Boehringer Mannheim GmbH, Mannheim, Germany

Filed Dec. 14, 1993, Ser. No. 165,859

Claims priority, application Germany, Dec. 19, 1992, 42 43 247.2

Int. Cl.^{6} G01F *23/28;* **G01B** *11/02*

U.S. Cl. 250—577 **14 Claims**



1. An apparatus for automatic exact dosing of small amounts of liquid in a medical analysis system, said apparatus comprising:

- a transparent measuring tube, said measuring tube comprising a capillary tube having an inner diameter of less than 1 mm, said measuring tube also including a liquid transfer opening at a first end thereof, said liquid transfer opening for aspiration of fluid;
- a fluid phase boundary detection means for automatically detecting a fluid phase boundary in said measuring tube, wherein an electrical position signal corresponding to a position of the fluid phase boundary is generated, said fluid phase boundary detection means comprising an illumination device for providing evenly distributed light onto a detection section of the measuring tube, said illumination device including at least one light source for illuminating said measuring tube, light reception means for receiving light from said illumination device, said light reception means detecting light passing through said measuring tube from said illumination device, said light reception means including at least one light detector and an optical imaging system for generating an image of the detection section in an image plane, and a plurality of closely spaced light-sensitive elements in the image plane; said fluid phase boundary detection means further comprising data processing means for processing signals from the at least one light detector into the electrical position signal indicating the position of the fluid phase boundary in the measuring tube; said apparatus further comprising
- electronic control means for controlling aspiration and withdrawal of the fluid from the measuring tube in precisely defined amounts based upon the electrical position signal corresponding to the position of the fluid phase boundary in the measuring tube,
- wherein a position of the fluid phase boundary in the detection section of the measuring tube is detected by the data processing means from a signal curve of the signals of the at least one light detector being dependent upon a spatial distribution of the intensity of the received light.

5,463,229

CIRCUIT BOARD FOR OPTICAL DEVICES

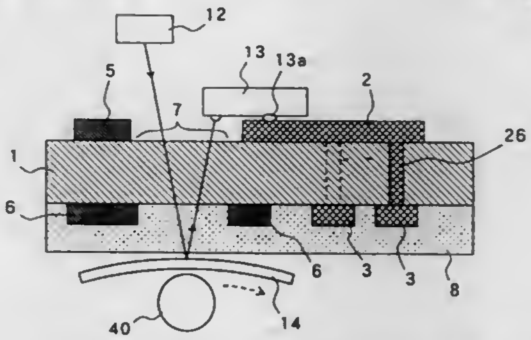
Mitsuo Takase, Kamagaya; Nobuhiro Fukuda, Yokohama, and Toshihiro Dodo, Chigasaki, all of, Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Filed Apr. 7, 1994, Ser. No. 224,534

Claims priority, application Japan, Apr. 7, 1993, 5-080429; May 26, 1993, 5-124057

Int. Cl.^{6} H01L *27/14;31/12;31/16*

U.S. Cl. 257—59 **39 Claims**



1. An optical circuit board for adapted mounting one or more LSI chips for emitting and/or receiving light, comprising:

- a transparent substrate;
- a window portion which is formed as a slit-like transparent region of said transparent substrate for transmitting light coming in and going out of said LSI chip;
- a plurality of electrodes provided on a first primary surface of said transparent substrate corresponding to said LSI chip respectively and disposed at least on one side of said window portion along the longitudinal direction of said window portion;
- a plurality of aggregated electrodes provided on a second primary surface on a region corresponding to said electrodes in a manner extending respectively in the longitudinal direction of said window portion, said second primary surface being opposite to said first primary surface with reference to said transparent substrate; and
- an electrical connection portion penetrating said transparent substrate; wherein
- each of said aggregated electrodes is electrically connected with a plurality of electrodes which constitute a part of said electrodes through said electrical connection portion, respectively.

5,463,230
ACTIVE MATRIX BOARD

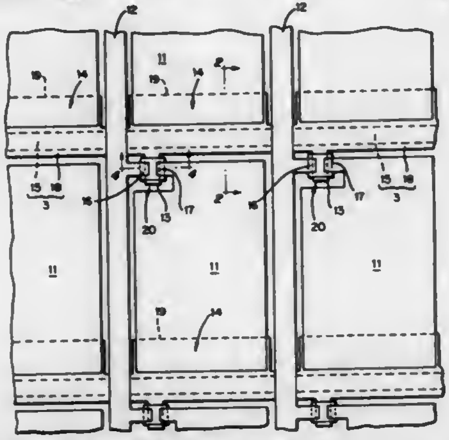
Hidenori Negoto; Mikio Katayama, both of Ikoma; Kiyoshi Nakazawa, Fujiidera; Hiroaki Kato, Nara; Yuzuru Kanemori, Tenri, and Takayoshi Nagayasu, Nara, all of, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 60,511, May 12, 1993, abandoned, which is a continuation of Ser. No. 857,724, Mar. 26, 1992, abandoned, which is a continuation of Ser. No. 564,287, Aug. 8, 1990, abandoned. This application Nov. 7, 1994, Ser. No. 338,795

Claims priority, application Japan, Aug. 11, 1989, 1-209401

Int. Cl.⁶ H01L *27/01;27/13*

U.S. Cl. 257—66 **6 Claims**



1. An active matrix board, comprising:

a matrix of pixel electrodes each having a thin-film transistor element connected thereto on an insulating substrate;

source lines connected to each thin-film transistor element; and

gate lines operatively coupled to said pixel electrodes wherein each gate line comprises:

- i. a first gate line formed of a low resistance metal and located outside of the areas covered by said pixel electrodes;
- ii. a second gate line fomred of a metal having a substantially higher resistance to etchants than does said first gate line, said second gate line completely covering said first gate line; and
- iii. said second gate line comprising a plurality of projecting parts, each projecting part being an addition capacity electrode extending entirely across the width of the pixel electrode.

5,463,231
METHOD OF OPERATING THYRISTOR WITH INSULATED GATES

Tsuneo Ogura, Yokohama; Kiminori Watanabe, Kawasaki; Akio Nakagawa, Hiratsuka; Yoshihiro Yamaguchi, Urawa; Norio Yasuhara, Yokohama; Tomoko Matsudai, Tokyo; Shigeru Hasegawa, Yokohama, and Kazuya Nakayama, Sagamihara, all of, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 164,756, Dec. 10, 1993, Pat. No. 5,428,228, which is a continuation-in-part of Ser. No. 896,422, Jun. 10, 1992, Pat. No. 5,315,134. This application Dec. 2, 1994, Ser. No. 353,385

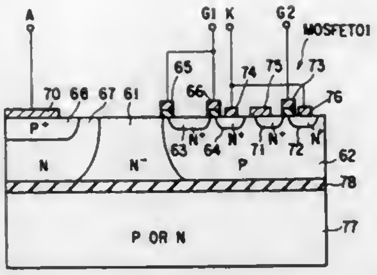
Claims priority, application Japan, Jun. 10, 1991, 3-137894; Dec. 26, 1991, 3-345501; Dec. 10, 1992, 4-352213; Jun. 30, 1993, 5-183415

Int. Cl.⁶ H01L *29/74;31/111*

U.S. Cl. 257—138 **20 Claims**

1. A thyristor with insulated gates, comprising:

an emitter layer of a first conductivity type, a base layer of a second conductivity type, a base layer of the first conductivity type, and an emitter layer of the second conductivity type, arranged to form a pnpn structure;



a first well layer of the second conductivity type, electrically isolated from said base and emitter layers of the second conductivity type;

a first source layer and a first drain layer which are of the first conductivity type and formed in said first well layer, said emitter and first drain layers of the first conductivity type being electrically connected to each other;

a first gate electrode formed via a gate insulated film on a first interposed region of the second conductivity type as a portion of said base layer of the second conductivity type between said emitter and base layers of the first conductivity type;

a second gate electrode formed via a gate insulating film on a second interposed region of the second conductivity type as a portion of said first well layer between said first source and first drain layers of the first conductivity type;

a first main electrode connected to said emitter layer of the second conductivity type; and

a second main electrode connected to said first source layer and the first conductivity type.

5,463,232
SOLID-STATE IMAGING DEVICE WITH INTERNAL SMEAR ELIMINATOR

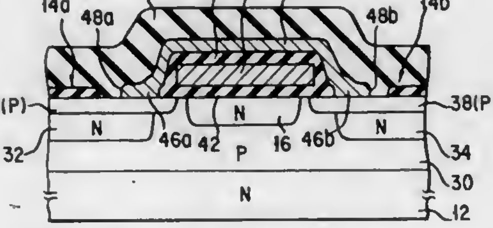
Hirofumi Yamashita; Ikuko Inoue, both of Kawasaki; Michio Sasaki, and Ryohei Miyagawa, both of Yokohama, all of, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 831,362, Feb. 5, 1992, abandoned. This application Apr. 8, 1993, Ser. No. 43,632

Claims priority, application Japan, Feb. 5, 1991, 3-014489; Sep. 30, 1991, 3-278542

Int. Cl.⁶ H01L *29/796;27/14;31/00*

U.S. Cl. 257—223 **7 Claims**



1. A semiconductor imaging device comprising:

a semiconductive substrate;

a well region in said substrate;

an array of rows and columns of photoelectric cells in said well region, each of said cells having a first impurity-doped semiconductor layer which is different in conductivity type from said well region;

a plurality of first charge-transfer sections extending along the rows of cells on said substrate and having outputs;

a second charge transfer section coupled to the outputs of the first transfer sections and extending transverse to said first transfer sections;

light-shield means overlying said first charge-transfer sections, for cutting off an internal reflection path between each cell and a corresponding one of said first charge-transfer sections, and for preventing an incident light from being introduced into said transfer channel region through the reflection path as a leak component thereto;

a second impurity-doped semiconductor layer having the same conductivity as said well region and overlapping said first impurity-doped semiconductor layer in said well region, said second impurity-doped semiconductor layer being set at a reference ground potential; and

said light-shield means comprising a conductive layer having an end portion being in contact with said second impurity-doped semiconductor layer at a surface of said substrate, thereby causing said conductive layer to be potentially equivalent to or greater than said second impurity-doped semiconductor layer.

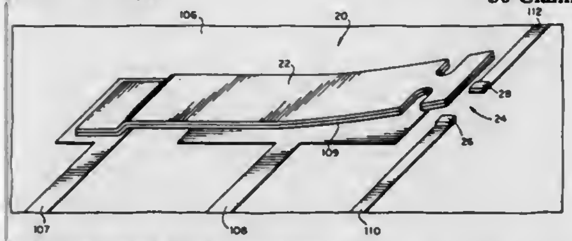
5,463,233
MICROMACHINED THERMAL SWITCH

Brian L. Norling, Mill Creek, Wash., assignor to AlliedSignal Inc., Morris Township, N.J.

Filed Jun. 23, 1993, Ser. No. 81,592

Int. Cl.^{6} H01H *37/54;37/12;* **H01L** *29/43;29/772*

U.S. Cl. 257—254 **30 Claims**



1. A temperature switch comprising:

a sensing element which includes a bimetallic strip, said sensing element adapted to be displaced as a function of temperature defining a first stable position and a second stable position;

means for biasing said sensing element and causing said sensing element to be unstable between said first stable position and said second stable position, wherein said biasing means includes means for applying an electrostatic force to said sensing element; and

means, Operatively coupled to said sensing element, for providing signals indicative of said first stable position and said second stable position.

5,463,234
HIGH-SPEED SEMICONDUCTOR GAIN MEMORY CELL WITH MINIMAL AREA OCCUPANCY

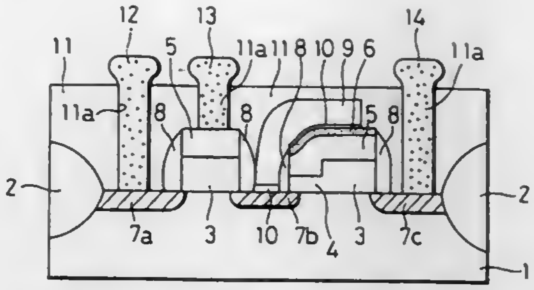
Akira Toriumi; Naoyuki Shigyo; Tetsunori Wada; Hiroyoshi Tanimoto; Kazuya Ohuchi, all of Kanagawa, and Makoto Yoshimi, Tokyo, all of, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 40,859, Mar. 31, 1993, abandoned. This application Mar. 17, 1995, Ser. No. 407,040

Claims priority, application Japan, Mar. 31, 1992, 4-077899; Apr. 1, 1992, 4-079609; Sep. 18, 1992, 4-250134; Feb. 24, 1993, 5-035792

Int. Cl.^{6} H01L *23/48;27/02*

U.S. Cl. 257—296 **16 Claims**



1. A dynamic random access memory (DRAM) cell equipped with a power supply line, a bit line and a word line therein, the memory cell comprising:

first transistor, having a gate, a source and a drain;

a second transistor, for storing an electric charge;

said second transistor having a first gate for erasing the charge stored at the second transistor, a second gate, a source and a drain; and

a diode having first and second electrodes,

wherein said drain of said first transistor is connected to said source of said second transistor and said first electrode of said diode;

said first and second gates are commonly connected to said second electrode of said diode;

said source of said first transistor, said gate of said first transistor and said drain of said second transistor are connected to said bit line, said word line, and said power supply line, respectively.

5,463,235
SEMICONDUCTOR MEMORY COMPRISING A MEMORY CELL WITHOUT A TRANSISTOR

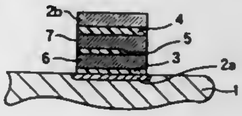
Tatsuya Ishii, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

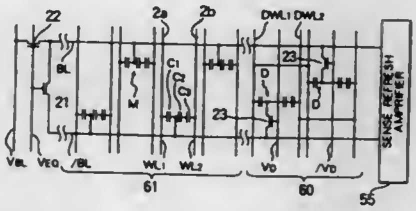
Filed Jul. 25, 1994, Ser. No. 279,598

Claims priority, application Japan, Jul. 26, 1993, 5-183700

Int. Cl.^{6} H01L *29/68;29/78;29/92;27/02*

U.S. Cl. 257—300 **4 Claims**





1. A semiconductor memory comprising a memory cell, said memory cell being free of transistors and comprising:

a laminated structure including a first word line, a first dielectric film having a first area and a first dielectric constant and disposed on said first word line, a bit line disposed on said first dielectric film, a second dielectric film having a second area and a second dielectric constant and disposed on said bit line, an information charge storage layer disposed on said second dielectric film, a third dielectric film having a third area and a third dielectric constant and disposed on said information charge storage layer, and a second word line disposed on said third dielectric film, wherein at least one of the second area and the second dielectric constant is smaller than the first area and the first dielectric constant, respectively, and the third area and the third dielectric constant, respectively.

5,463,236

SEMICONDUCTOR MEMORY DEVICE HAVING IMPROVED ISOLATION STRUCTURE AMONG MEMORY CELLS

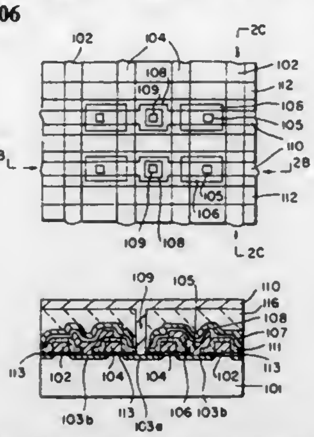
Masato Sakao, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed May 16, 1994, Ser. No. 242,836

Claims priority, application Japan, May 16, 1993, 5-136800

Int. Cl.⁶ H01L *29/78*

U.S. Cl. 257—306 **8 Claims**



1. A semiconductor memory device comprising a memory cell portion formed on a semiconductor substrate and having a plurality of memory cells formed in respective active regions, each of said memory cells being composed of a cell transistor and a storage capacitor, each of said active regions being isolated from peripheral ones of said active regions by trench isolation regions in a first direction and by isolation gate conductors in a second direction perpendicular to said first direction, said isolation gate conductors including conductive lines, respectively, which extend in said second direction in parallel to one another, and each of said conductive lines being formed in a straight line shape with a substantially uniform width.

5,463,237

MOSFET DEVICE HAVING DEPLETION LAYER

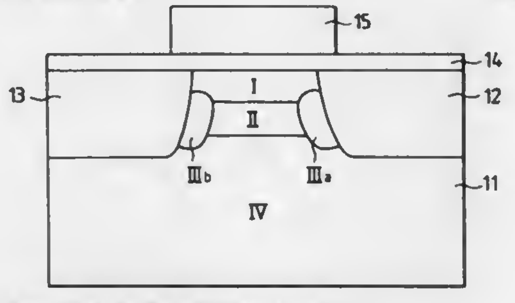
Masaki Funaki, Yokohama, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Nov. 3, 1994, Ser. No. 335,409

Claims priority, application Japan, Nov. 4, 1993, 5-298972; Nov. 9, 1993, 5-303367; Nov. 24, 1993, 5-315810; Nov. 24, 1993, 5-315811

Int. Cl.⁶ H01L *29/78;27/02*

U.S. Cl. 257—336 **7 Claims**



1. A semiconductor device comprising:

a substrate having a first conduction type;

a gate insulating film provided on the substrate;

a gate electrode formed on the gate insulating film;

a source region provided on the substrate and having a second conduction type different from the first conduction type;

a drain region provided on the substrate and having the second conduction type;

wherein the source region and the drain region extend below the gate insulating film and are located at respective sides of the gate electrode;

a first region provided on the substrate and having the first conduction type, the first region extending below the gate insulating film;

a second region provided on the substrate and having the second conduction type, the second region extending below the first region and being separated from the gate insulating film by the first region, the second region connecting with the first region via a pn junction; and

third regions provided on the substrate and having the first conduction type, the third regions connecting with the second region via respective pn junctions, wherein a first one of the third regions extends between the second region and the source region and separates the second region from the source region, and a second one of the third regions extends between the second region and the drain region and separates the second region from the drain region;

wherein the first region has a depth-direction width which is smaller than a sum of a depth-direction width of a depletion layer caused by the pn junction with the second region and a depth-direction width of a depletion layer caused by application of a voltage to the gate electrode, and wherein the third regions have a lateral-direction width which is greater than a sum of a lateral-direction width of a depletion layer caused by the source region and a lateral-direction width of a depletion layer caused by the pn junctions with the second region.

5,463,238

CMOS STRUCTURE WITH PARASITIC CHANNEL PREVENTION

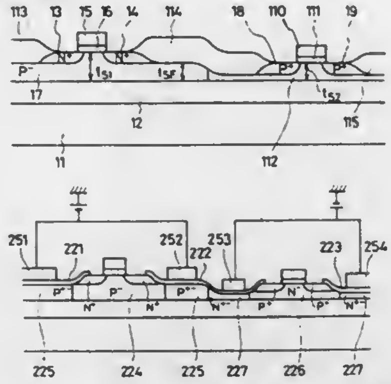
Kunihiro Takahashi; Masaaki Kamiya; Yoshikazu Kojima, and Hiroaki Takasu, all of Tokyo, Japan, assignors to Seiko Instruments Inc., Japan

Filed Feb. 25, 1993, Ser. No. 22,369

Claims priority, application Japan, Feb. 25, 1992, 4-037917; Jun. 3, 1992, 4-142884

Int. Cl.⁶ H01L *27/02;21/225;29/06*

U.S. Cl. 257—351 **27 Claims**



1. A semiconductor device, comprising: an integrated circuit having complementary type metal insulator semiconductor transistors, the integrated circuit being formed in a semiconductor single crystal silicon layer provided on an electrically insulating layer, the semiconductor single crystal silicon layer having at least a first region where an N-type MIS transistor is formed and a second region where a P-type MIS transistor is formed, wherein a thickness of the first region is different from a thickness of the second region in the semiconductor single crystal silicon layer.

5,463,239

INTEGRATED SEMICONDUCTOR CIRCUIT PROTECTED AGAINST HIGH VOLTAGE BREAKDOWN

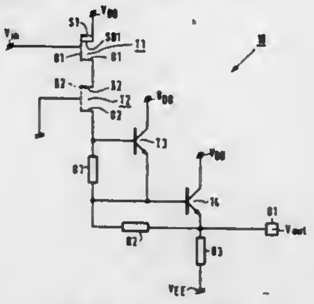
Kurt Muhlemann, Zürich, Switzerland, assignor to U.S. Philips Corporation, New York, N.Y.

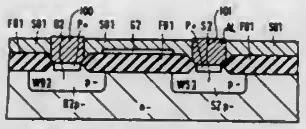
Continuation of Ser. No. 31,420, Mar. 15, 1993, abandoned. This application Jun. 6, 1994, Ser. No. 254,456

Claims priority, application European Pat. Off., Mar. 16, 1992, 92200740

Int. Cl.⁶ H03K *17/04*

U.S. Cl. 257—355 **24 Claims**





1. A circuit having at least a part thereof adapted to be integrated on a semiconductor substrate, said circuit comprising: a first and a second supply voltage terminal, an input and an output, a switching transistor having a gate, a drain and a source, a protection transistor having a gate and a drain, and a sub-circuit, wherein the switching transistor and the protection transistor are connected in a series circuit between the first and second supply voltage terminals such that said terminals apply a high voltage across said series circuit, the gate of the switching transistor being connected to the input, the source of the switching transistor being connected to the first supply voltage terminal, and the drain of the protection transistor supplying a signal to the sub-circuit, and means for connecting an output of the sub-circuit to the output of the circuit, wherein the gate of the protection transistor receives a fixed voltage, wherein at least one of the protection transistor and the switching transistor is constructed so that the switching transistor drain voltage is limited to a value below its threshold breakdown voltage, and wherein the gate of the protection transistor is connected to the second supply voltage terminal so as to receive said fixed voltage.

5,463,240

CMIS DEVICE WITH INCREASED GAIN

Toshio Watanabe, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Nov. 1, 1994, Ser. No. 333,048

Claims priority, application Japan, Nov. 1, 1993, 5-273343

Int. Cl.⁶ H01L *27/08;29/78;* **H03K** *17/16;5/13*

U.S. Cl. 257—369 **12 Claims**

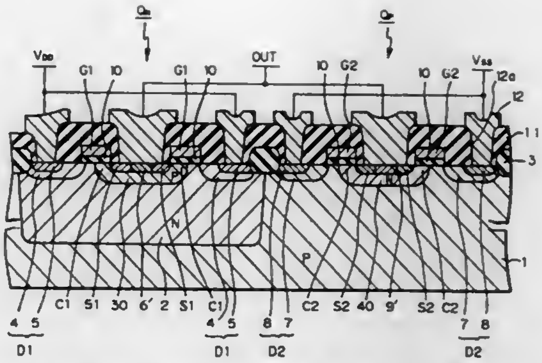
1. A CMIS device comprising:

a semiconductor substrate including a first N-type region for a drain of an N-channel transistor and a first P-type region for a drain of a P-channel transistor;

a second P-type region formed within said first N-type region, a surface of said second P-type region being for a channel of said N-channel transistor;

a second N-type region formed within said first P-type region, a surface of said second N-type region being for a channel of said P-channel transistor;

a third N-type region formed within said second P-type region, said third N-type region being for a source of said N-channel transistor;



a third P-type region formed within said second N-type region, said third P-type region being for a source of said P-channel transistor;

a first gate electrode formed above said second P-type region;

a second gate electrode formed above said second N-type region;

said first N-type region being connected to a first power supply means for receiving a first voltage;

said first P-type region being connected to a second power supply means for receiving a second voltage lower than the first voltage;

means for connecting said second P-type region, said second N-type region, said third N-type region and said third P-type region to each other.

5,463,241

INSULATED-GATE SEMICONDUCTOR DEVICE WITH A BURIED INSULATION LAYER

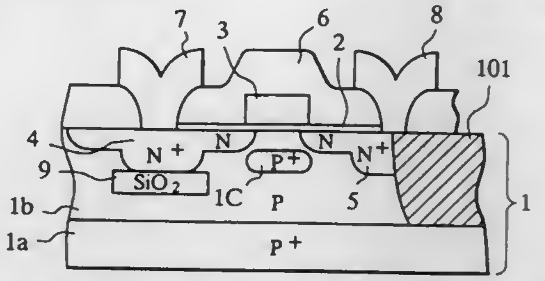
Masahiko Kubo, Chiba, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 31, 1994, Ser. No. 298,668

Claims priority, application Japan, Sep. 1, 1993, 5-217602; Aug. 25, 1994, 6-200473

Int. Cl.⁶ H01L *27/08;27/12*

U.S. Cl. 257—376 **27 Claims**



1. A semiconductor device having an insulated gate, first and second main electrodes, and a channel region between the first and second main electrodes, said semiconductor device comprising:

(a) a high-impurity-concentration first semiconductor region of a first conductivity type;

(b) a second semiconductor region of said first conductivity type formed on said first semiconductor region, the impurity concentration of said second semiconductor region being lower than that of said first semiconductor region;

(c) a third semiconductor region of said first conductivity type formed in said second semiconductor region adjacent to the channel region, the impurity concentration of said third semiconductor region being higher than that of said second semiconductor region;

(d) high-impurity-concentration fourth and fifth semiconductor regions of a second conductivity type formed at the upper surface and in said second semiconductor region and serving as the first and second main electrode regions, respectively;

(e) a highly conductive region formed in said second semiconductor region, for connecting said first and fourth semiconductor regions with each other; and

(f) an insulation layer locally formed under said fifth semiconductor region, wherein said first semiconductor region serves as an auxiliary first main electrode connected to an outer circuit.

5,463,242

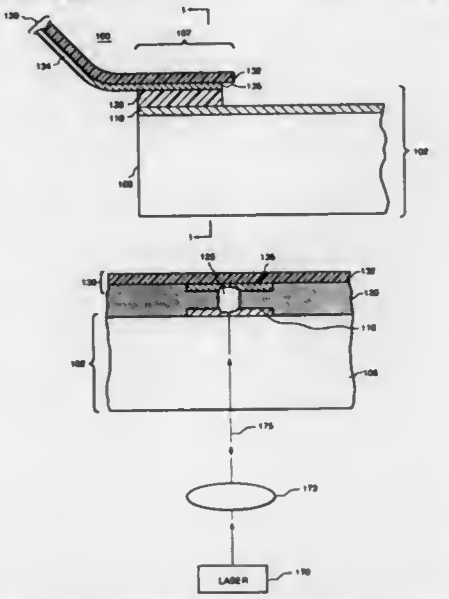
THIN FILM CIRCUITS WITH HIGH DENSITY CONNECTOR

Donald E. Castleberry, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed May 3, 1994, Ser. No. 237,702

Int. Cl.⁶ H01L *29/43;31/0224*

U.S. Cl. 257—448 **6 Claims**



1. A high density thin film circuit comprising:

a wafer comprising a plurality of electrical contact pads, said contact pads being disposed on an interconnect area of said wafer and having a pitch of less than about 100 μm;

a high density connector comprising a plurality of electrical connection lines disposed in a pattern corresponding to the contact pads on said wafer, respective ones of said electrical connection lines being electrically coupled to corresponding ones of the wafer contact pads; and

a non-conductive organic adhesive layer disposed between said and said connector so as to bond said connector to said wafer;

the electrical coupling between respective ones of said connector electrical connection lines and said wafer contact pads comprising at least one pyrolytic weld coupling disposed in said nonconductive organic adhesive layer, respective pyrolytic weld couplings being disposed between respective ones of said contact pads and said connector electrical connection lines, said pyrolytic weld comprising an electrically conductive carbon material decomposed from said adhesive, said non-conductive adhesive layer being disposed so as to surround said respective pyrolytic weld couplings.

5,463,243

DIELECTRIC ISOLATED HIGH VOLTAGE SEMICONDUCTOR DEVICE

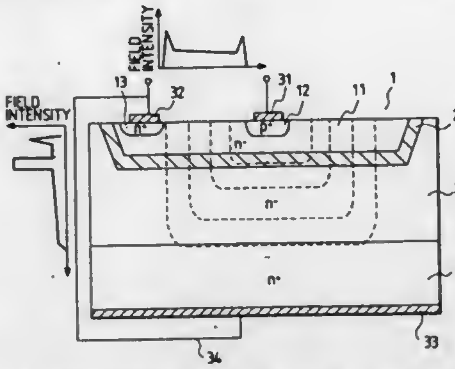
Naoki Sakurai, and Yoshitaka Sugawara, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 5, 1993, Ser. No. 147,314

Claims priority, application Japan, Nov. 6, 1992, 4-296786

Int. Cl.⁶ H01L *27/12*

U.S. Cl. 257—524 **15 Claims**



10. A semiconductor device having a supporter including stacked layers of a first semiconductor layer of a first conductivity type and a second semiconductor layer with a higher impurity concentration than said first semiconductor layer, said second semiconductor layer adjoining said first semiconductor layer, and at least one semiconductor island which is buried in said first semiconductor layer so as to have a surface exposed outside of said semiconductor device, wherein an insulating film is interposed between said at least one semiconductor island and said first semiconductor layer, wherein circuit elements are formed in said at least one semiconductor island, said circuit apparatus characterized by comprising:

means for applying a reverse bias to a main junction of a circuit element of said at least one island, which circuit element has a highest applied potential of circuit elements of said at least one island, said reverse bias being sufficient to form a depletion layer which extends from said main junction, through said insulating film, into said first semiconductor layer of said supporter.

5,463,244

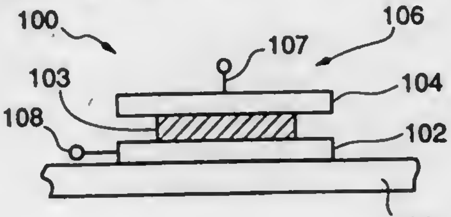
ANTIFUSE PROGRAMMABLE ELEMENT USING FERROELECTRIC MATERIAL

Carlos A. P. De Araujo; Larry D. McMillan, and Joseph D. Cuchiaro, all of Colorado Springs, Colo., assignors to Symetrix Corporation, Colorado Springs, Colo.

Filed May 26, 1994, Ser. No. 249,870

Int. Cl.⁶ H01L *27/02*

U.S. Cl. 257—530 **22 Claims**



1. An electrically programmable antifuse device comprising:

first and second electrodes;

a dielectric layer electrically insulating said first electrode from said second electrode, said dielectric layer comprising a layered superlattice material; and

fusing means for controllably altering said dielectric layer to form an electrical conductor connecting said first and second electrodes.

5,463,245

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE HAVING SEALING MEANS

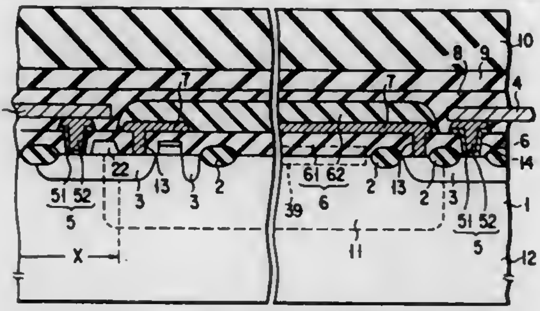
Yoichi Hiruta, Kashiwa, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 12, 1993, Ser. No. 151,176

Claims priority, application Japan, Nov. 14, 1992, 4-328892

Int. Cl.^{6} H01L *23/544*

U.S. Cl. 257—620 **5 Claims**



1. A semiconductor integrated circuit device comprising:

a first semiconductor integrated circuit device which comprises a first semiconductor substrate including an active region arranged in a main surface area and an inactive region arranged in a peripheral portion of the main surface area; a first semiconductor integrated circuit formed in the active region in the main surface area of said first semiconductor substrate; a first connection electrode formed in the inactive region; lead means having one end connected to said first connection electrode and the other end arranged to extend to the exterior of said first semiconductor substrate;

connection means for electrically connecting said first semiconductor integrated circuit to said first connection electrode; and

sealing means for sealing said first semiconductor integrated circuit device by using the inactive region of said semiconductor substrate of said first semiconductor integrated circuit device as a package region, said sealing means including a second semiconductor integrated circuit device which comprises a second semiconductor substrate which has a main surface facing the main surface of said first semiconductor substrate of said first semiconductor integrated circuit device and has an active region formed in the main surface and an inactive region formed in the peripheral portion of the main surface, a second connection electrode formed in said inactive region, and lead means having one end connected to said second connection electrode and the other end arranged to extend to the exterior of said second semiconductor substrate; and connection means for connecting said first and second semiconductor integrated circuit devices together in an air-tight fashion.

5,463,246

LARGE SCALE HIGH DENSITY SEMICONDUCTOR APPARATUS

Mitsuo Matsunami, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 933,582, Aug. 24, 1992, abandoned, which is a continuation of Ser. No. 456,865, Dec. 27, 1989, abandoned. This application May 3, 1994, Ser. No. 237,324

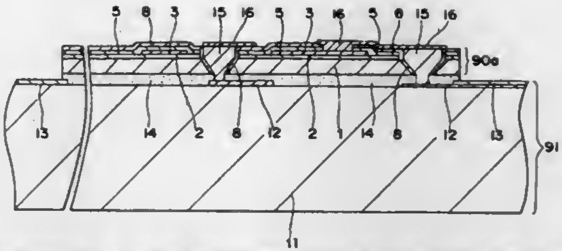
Claims priority, application Japan, Dec. 29, 1988, 63-331990; Jan. 18, 1989, 1-10731; Sep. 4, 1989, 1-229047

Int. Cl.^{6} H01L *23/48;21/44*

U.S. Cl. 257—621 **10 Claims**

6. A semiconductor apparatus comprising:

an electrically insulating circuit substrate;



a plurality of electrically conductive interconnection film of a predetermined pattern separately formed on said circuit substrate;

at least one semiconductor chip having a plurality of electrodes, said semiconductor chip being bonded through an adhesive layer on said circuit substrate and said interconnection films;

a plurality of through holes formed in said semiconductor chip so as to pierce said semiconductor chip in the direction of the thickness thereof; and

a plurality of electrically conductive bodies formed in each of said through holes, respectively, each of said conductive bodies electrically connecting a predetermined one of said electrodes of said semiconductor chip to a predetermined one of said interconnection films formed on said circuit substrate,

wherein each of said conductive bodies is electrically connected directly to said predetermined one of said interconnection films formed on said circuit substrate on the bottom plane of each of said plurality of through holes and each of said conductive bodies is disposed in each of said through holes.

5,463,247

LEAD FRAME MATERIAL FORMED OF COPPER ALLOY FOR RESIN SEALED TYPE SEMICONDUCTOR DEVICES

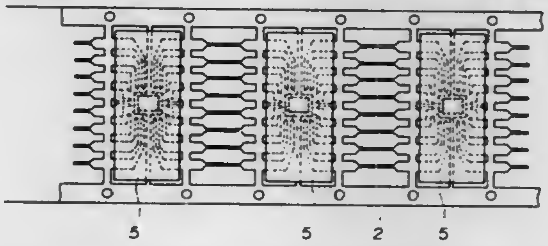
Rensei Futatsuka; Shunichi Chiba, and Junichi Kumagai, all of Aizuwakamatsu, Japan, assignors to Mitsubishi Shindoh Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 72,887, Jun. 7, 1993, abandoned. This application Feb. 15, 1994, Ser. No. 196,316

Claims priority, application Japan, Jun. 11, 1992, 4-177500

Int. Cl.^{6} H01L *23/48;29/44;29/52;29/60*

U.S. Cl. 257—666 **8 Claims**



1. A lead frame material formed of a CU alloy for use in a resin sealed type semiconductor device,

wherein said Cu alloy consists essentially, by weight percent, of 2.0 to 3.8% Ni, 0.51 to 0.9% Si, 0.2 to 1.5% Zn, 0.015 to 0.03% Mg, 0.15 to 0.8% Sn, and the balance being Cu and inevitable impurities,

said inevitable impurities containing 15 ppm or less sulfur (S) and 10 ppm or less carbon (C).

5,463,248
SEMICONDUCTOR PACKAGE USING AN ALUMINUM NITRIDE SUBSTRATE

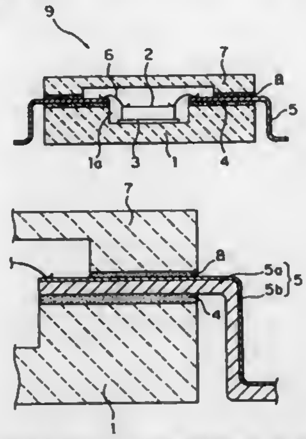
Keiichi Yano, Kawasaki; Takashi Takahashi; Kazuo Kimura, both of Tokyo; Yoshitoshi Sato, Yokohama; Kouji Yamakawa, Kawasaki; Toshishige Yamamoto; Masafumi Fujii, both of Nishinomiya; Shizuki Hashimoto, Yamaguchi, and Hiroshi Takamichi, Ube, all of, Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa; Sumitomo Metal Industries, Ltd., Osaka, and Sumitomo Metal Ceramics Inc., Yamaguchi, all of, Japan

Filed May 17, 1994, Ser. No. 243,864

Claims priority, application Japan, May 18, 1993, 5-116249

Int. Cl.^{6} H01L *23/02;23/48*

U.S. Cl. 257—677 **15 Claims**



1. A semiconductor package comprising an aluminum nitride substrate having a semiconductor element mounted thereon, a lead frame junctioned to a side of said aluminum nitride substrate mounting said semiconductor element and composed of a lead frame matrix of a ferromagnetic metal and a coating layer of a nonmagnetic metallic material superposed on only one of opposite surfaces of said lead frame matrix, said coating layer having a thickness in the range of 8 to 20 μm, a bonding wire junctioned on said coating layer of nonmagnetic metallic material and electrically connecting said semiconductor element with said lead frame, and a ceramic sealing member junctioned to said aluminum nitride substrate in such a manner as to cover said semiconductor element.

5,463,249
ELECTRONIC CIRCUIT SYSTEM UNIT WITH WIRING SUBSTRATE

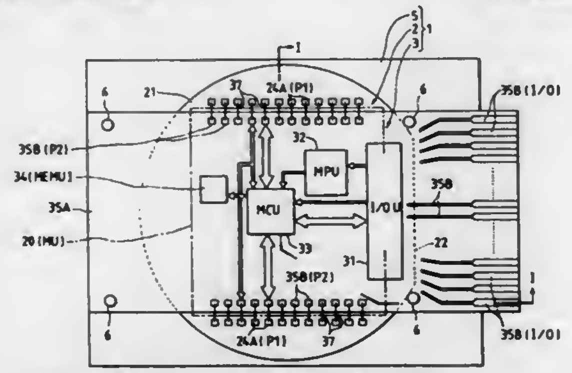
Yutaka Shinbo, Hino; Takeshi Kajimoto, Takarazuka; Mitsuteru Kobayashi, Hanno, and Katsuyuki Sato, Akishima, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 24, 1992, Ser. No. 982,169

Claims priority, application Japan, Nov. 27, 1991, 3-312182

Int. Cl.^{6} H01L *23/48;29/44;29/52;29/60*

U.S. Cl. 257—690 **19 Claims**



1. An electronic circuit system unit comprising;

a semiconductor wafer having a circuit mounting surface;

a plurality of integrated circuit blocks formed on said circuit mounting surface, constituting basic units, which are arranged repeatedly on said circuit mounting surface;

a wiring substrate having a circuit mounting surface, an insulating substrate, a wiring layer formed on said insulating substrate and a back surface;

a semiconductor pellet mounted on said circuit mounting surface of said wiring substrate in an area where said wiring substrate and said semiconductor wafer overlap having an integrated circuit element formed thereon;

means for electrically connecting said integrated circuit element to at least one of said integrated circuit blocks, and

wherein said semiconductor wafer and said wiring substrate are arranged to overlap each other in a state where the circuit mounting surface of said semiconductor wafer and the back surface of said wiring substrate face each other, and wherein an area of the periphery of said semiconductor wafer protrudes from the periphery of said wiring substrate that overlaps said semiconductor wafer, and wherein said means for electrically connecting said integrated circuit element to at least one of said integrated circuit blocks comprises first terminals disposed on the circuit mounting surface of said semiconductor wafer in an area of the protruded area and second terminals disposed on a surface of said wiring substrate and wires electrically connected to said first and second terminals.

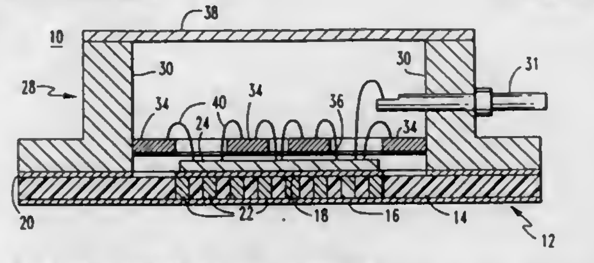
5,463,250
SEMICONDUCTOR COMPONENT PACKAGE

Ngon B. Nguyen, Jessup, Md., and Franklin B. Jones, Shrewsbury, Mass., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 29, 1994, Ser. No. 235,055

Int. Cl.^{6} H01L *23/02;23/12*

U.S. Cl. 257—698 **13 Claims**



1. A semiconductor package, comprising:

a substrate having a ceramic core with first and second opposite planar surfaces, a copper foil layer bonded to the second planar surface, a copper inner mounting pad on the first planar surface for conductively supporting a semiconductor chip having multiple electrodes, a copper outer ring on the first planar surface surrounding and electrically isolated from the inner mounting pad, and a plurality of spaced copper vias extending through the ceramic core electrically connecting the mounting pad to the copper foil layer; and

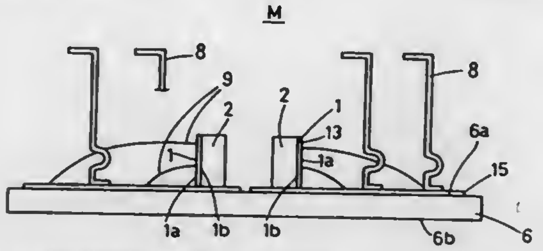
a metallic frame assembly having a central chamber formed by sidewalls of a predetermined height mounted on the outer ring of the first planar surface of said substrate, a pair of terminals extending through the sidewalls of the chamber, and a wirebonding grid spanning the central chamber and having an electrical isolation layer bonded to a surface of the wirebonding grid opposing and spaced from the substrate, said wirebonding grid having a plurality of passages spaced from the sidewalls and from each other for receiving metallic wirebonds connected at one end to the wirebonding grid and at an opposite end to the multiple electrodes of the chip mounted on the inner mounting pad, said inner mounting pad and grid being spaced one above the other with the grid and passages configured to permit connection of wirebonds of optimal equal length to each such electrode.

5,463,251

POWER SEMICONDUCTOR PACKAGE HAVING IMPROVED DURABILITY

Akira Fujita, and Naoki Yoshimatsu, both of Fukuoka, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 19, 1993, Ser. No. 47,465
Claims priority, application Japan, Jul. 8, 1992, 4-180982
Int. Cl.⁶ H01L *23/02*
U.S. Cl. 257—717 **17 Claims**



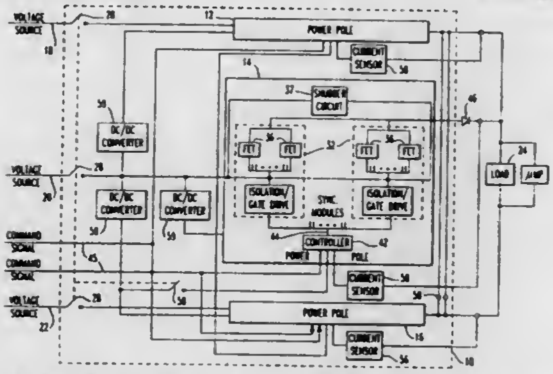
1. A semiconductor device comprising:
(a) a heat sink having a major surface;
(b) a mounting substrate fixed on said heat sink and including
  (b-1) an insulating layer provided on said major surface of said heat sink, and
  (b-2) a pattern electrode layer selectively formed on said insulating layer;
(c) a metal support formed on said mounting substrate and having a surface forming an angle of substantially not more than 90° with said major surface of said heat sink; and
(d) a semiconductor body soldered on said surface of said support to thereby be supported with said support.

5,463,252

MODULAR SOLID STATE RELAY

Franklin B. Jones, Catonsville; Ngon B. Nguyen, Jessup, and Leroy Laurandeau, Cockeysville, all of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 1, 1993, Ser. No. 130,401
Int. Cl.⁶ H01L *23/16;39/02*
U.S. Cl. 257—723 **17 Claims**



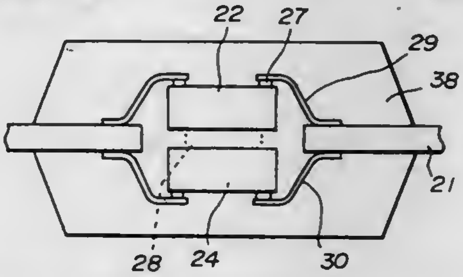
1. A solid state circuit breaker, comprising
a plurality of current carrying power poles, each having an input for connection to a DC power source, a solid state switching relay, and an output for connection to an electrical load;
each solid state switching relay including a plurality of individual stacked switching circuit modules, each switching module including a sheet metal heat dissipating substrate having mounted thereon a plurality of field effect transistors with commonly connected source electrodes, commonly connected drain electrodes, and commonly connected gate electrodes, said plurality of modules being parallel connected by the source and drain electrodes between the DC power source and the electrical load;
a drive circuit mounted to each of the plurality of substrates and connected to the commonly connected gate electrodes, the drive circuit being operable to a first condition to turn the field effect transistors to the off state and operable to a second condition to turn the field effect transistors to the on state; and
means for operating the drive circuit to the first and second condition.

5,463,253

SEMICONDUCTOR DEVICE HAVING A PLURALITY OF CHIPS

Masaki Waki, Sagamihara; Junichi Kasai, Kawasaki; Tsuyoshi Aoki, Sagamihara; Toshiyuki Honda, and Hirotaka Sato, both of Kawasaki, all of, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

PCT No. PCT/JP91/00348, § 371 Date Nov. 14, 1991, § 102(e) Date Nov. 14, 1991, PCT Pub. No. WO91/14282, PCT Pub. Date Sep. 19, 1991
Continuation of Ser. No. 778,993, Nov. 14, 1991, abandoned. This PCT application Mar. 14, 1991, Ser. No. 246,567
Claims priority, application Japan, Mar. 15, 1990, 2-65123
Int. Cl.⁶ H01L *23/28;23/16*
U.S. Cl. 257—724 **52 Claims**



1. A semiconductor device comprising:
lead frames respectively having first main surfaces and second main surfaces opposite to each other, bonding being able to be performed on the first and second main surfaces;
a first semiconductor chip;
first tape leads electrically connecting the first main surfaces of the lead frames to the first semiconductor chip;
a second semiconductor chip spaced apart from the first semiconductor chip;
second tape leads electrically connecting the second main surfaces of the lead frames to the second semiconductor chip; and
an electrically conductive adhesive layer which is provided between the first semiconductor chip and the second semiconductor chip and which fixes the first semiconductor chip and the second semiconductor chip to each other;
the first semiconductor chip has a first surface including an internal circuit, and a second surface opposite to the first surface;
the second semiconductor chip has a first surface including an internal circuit, and a second surface opposite to the first surface of the second semiconductor chip; and
the second surface of the first semiconductor chip is opposed to the second surface of the second semiconductor chip.

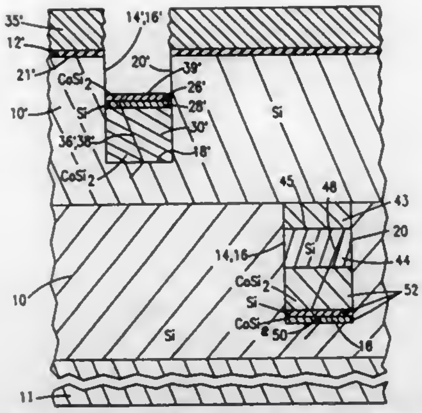
5,463,254

FORMATION OF 3-DIMENSIONAL SILICON SILICIDE STRUCTURES

Subramanian S. Iyer, Yorktown Heights; Richard D. Thompson, Lake Peekskill, and King-Ning Tu, Chappaqua, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 968,648, Oct. 30, 1992, abandoned. This application Jul. 25, 1994, Ser. No. 279,669
Int. Cl.⁶ H01L *21/283;23/48*
U.S. Cl. 257—757 **27 Claims**

1. An epitaxial conductor comprising:



- a substrate of single crystalline semiconductor material selected from the group consisting of silicon and alloys thereof,
- a first trench formed in said substrate having sidewall surfaces and a bottom surface,
- a first layer of single crystalline metal silicide epitaxially formed on said bottom surface,
- a second layer of single crystalline semiconductor material selected from the group consisting of silicon and alloys thereof epitaxially formed on said first layer, and
- a third layer of single crystalline metal silicide epitaxially formed on said second layer,
- said first and second layers being in twinning relationship to said substrate,
- said third layer being in twinning relationship to said first and second layers, and
- said third layer having the same crystallographic orientation as said substrate.

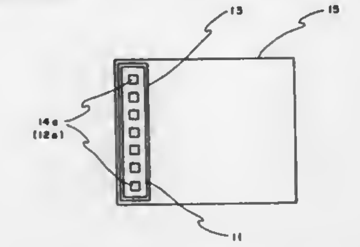
5,463,255

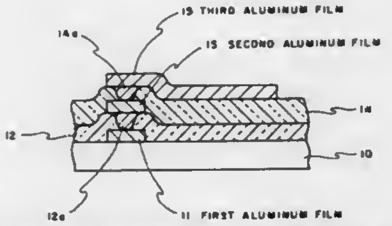
SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE HAVING AN ELECTRODE PAD INCLUDING AN EXTENDED WIRE BONDING PORTION

Toshio Isono, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Mar. 23, 1993, Ser. No. 35,638
Claims priority, application Japan, Mar. 30, 1992, 4-103630
Int. Cl.⁶ H01L *23/50*

U.S. Cl. 257—773 **14 Claims**





1. A semiconductor integrated circuit device having an electrode pad including:

- a semiconductor substrate having a major surface;
- a lower conductive film being formed on a limited area of said major surface of said semiconductor substrate, said limited area leaving at least one planar region on said major surface where said lower conductive film does not exist;
- an interlayer insulating film formed over at least said lower conductive film and at least said planar region;
- an upper conductive film being formed over said lower conductive film and at least said planar region with said interlayer insulating film being interposed between said upper and lower conductive films, a plurality of minute through holes extending from said upper conductive film through said interposed insulating film to said lower conductive film, said upper conductive film being electrically connected to said lower conductive film via said plurality of minute through holes, said portion of said upper conductive film extending over said planar region providing means for bonding a wire to said upper conductive film, and said portion of said interposed interlayer insulating film extending over said planar region providing means for uniformly supporting said wire bonded to said upper conductive film
- wherein said upper conductive film has a width which is the same as a width of said lower conductive film within a region of said limited area where said upper conductive film overlies said lower conductive film.

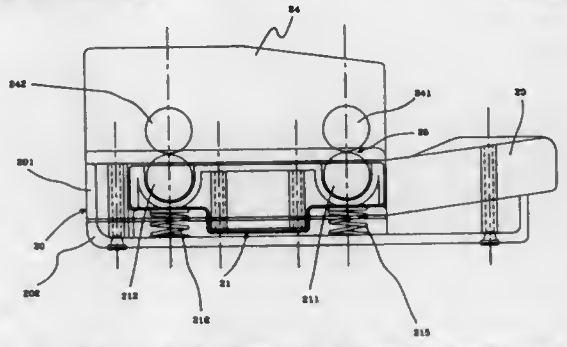
5,463,256

FEEDER USED WITH SCANNER

Oliver Wang, and Ben Hou, both of Taipei Hsien, Taiwan, Prov. of China, assignors to Primax Electronics Ltd., Taipei Hsien, Taiwan, Prov. of China

Filed May 27, 1994, Ser. No. 250,479
Int. Cl.⁶ B65H *5/06*

U.S. Cl. 271—274 **21 Claims**



1. A detachable feeder adapted to be used with a scanner for feeding an article to said scanner, comprising:

- a shell adapted to detachably mount to said scanner;
- a floating box contained in said shell;
- a driving device mounted substantially within said floating box for feeding said article to said scanner; and
- an adjusting device contained in said shell to adjust a location of said floating box in order to control a height of a passage through which said article can pass to be scanned by said scanner according to a thickness of said article.

5,463,257

WIND POWER MACHINE

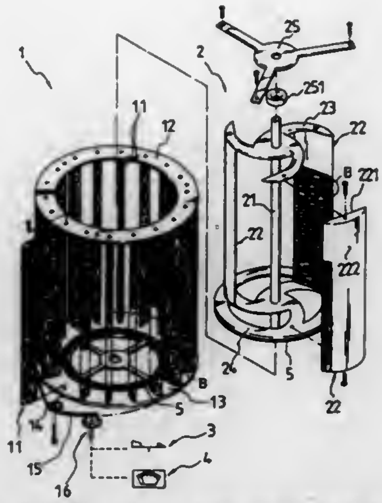
Ton A. Yea, 3 F, No. 27, Tzyh-Chyang Street, Tuu-Cheng City, Taipei Hsien, Taiwan, Prov. of China

Continuation of Ser. No. 273,173, Jul. 26, 1994, abandoned, which is a continuation of Ser. No. 155,886, Nov. 23, 1993, abandoned. This application Feb. 28, 1995, Ser. No. 396,101
Int. Cl.⁶ F03D *7/02;3/02*

U.S. Cl. 290—55 **5 Claims**

1. A wind power machine for generating electricity comprising:

- a hollow outer tower having a top and a bottom; and
- a rotatable inner tower, having a top and a bottom and mounted within the outer tower;



a plurality of air flow guiding plates surrounding the outside of the outer tower, the flow guiding plates being adapted to guide an air flow into said machine so as to rotate the inner tower, a pair of magnetic plates having the same polarity being disposed in a facing relationship between the bottom portion of the outer tower and the bottom portion of the rotatable inner tower, so that the rotatable inner tower is in a semi-floating state relative to the outer tower, said rotatable inner tower consists of a supporting shaft and at least two fan blades, each fan blade having a flat surface facing the air flow and a curved surface downstream thereof the air flow being directed against the flat surface of each blade by said guiding plates, the flow guiding plates in the outer tower and the flat surface on each fan blade defining V-shaped notches for guiding the air flow and increasing the pressure thereof.

5,463,258

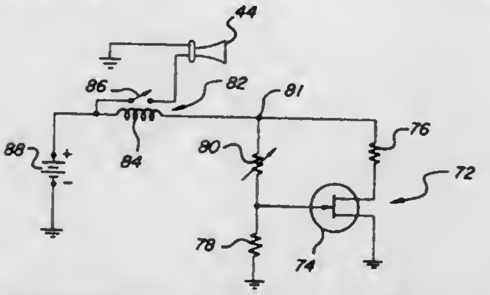
HORN ACTUATOR INCORPORATING A TRANSDUCER IN A STEERING WHEEL

Scott M. Filion, Newmarket; Colin C. Frost, Dover; Denis L. Moore, Rollinsford; Richard D. Roberge, Somersworth, and Vincent J. Yedlin, Manchester, all of N.H., assignors to Davidson Textron Inc., Dover, N.H.

Continuation-in-part of Ser. No. 875,390, Apr. 29, 1992, Pat. No. 5,269,559. This application Jan. 15, 1993, Ser. No. 5,314

Int. Cl.^{6} H01H ***35/00***

U.S. Cl. 307—10.1 **1 Claim**



1. An apparatus for actuating an electrical device in response to pressure applied to a deformable air bag cover door, comprising:

an air bag cover door deformable by hand pressure;

a force sensitive resistor attached to said cover door such that its resistance changes upon pressure being exerted on the cover door; and

a switching circuit connected to said force sensitive resistor for changing said switching circuit's conductive state in response to a change in the resistance of said force sensitive resistor, said switching circuit comprising a transistor switch controlled by said force sensitive resistor with said transistor switch having a first current carrying terminal for coupling said transistor switch to the electrical device, a second current carrying terminal coupled to a common ground, and a driving terminal coupled to said force sensitive resistor;

wherein said transistor switch is operable to provide a low impedance path from said first current carrying terminal to said second current carrying terminal when said force sensitive resistor undergoes a change in resistive value; and

wherein said switching circuit further comprises a resistive element having a first terminal coupled to said first current carrying terminal of said transistor switch and a second terminal for coupling said transistor switch to the electrical device, such that current flowing from the electrical device flows through said resistive element and said first current carrying terminal.

5,463,259

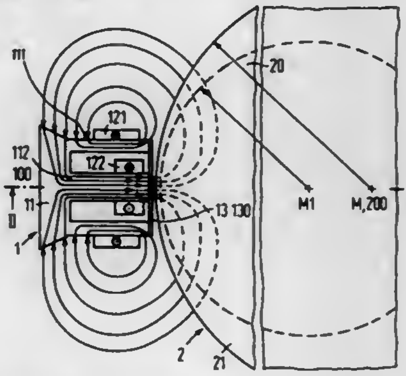
CONVERTER FOR GENERATING AN OUTPUT SIGNAL AS A FUNCTION OF THE POSITION OF A TRANSDUCER PART

Herbert Zimmer, Regensburg, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Mar. 12, 1993, Ser. No. 30,814

Int. Cl.^{6} G01B ***7/14***

U.S. Cl. 307—106 **9 Claims**



1. A converter, comprising:

a feed source furnishing a medium-frequency feed voltage of constant frequency and amplitude;

a coupling element;

a scanning head for producing an output signal as a function of a position of said coupling element relative to said scanning head;

said scanning head including:

- a shell core of magnetic material having a middle leg and a cup-shaped jacket concentrically surrounding said middle leg, said cup-shaped jacket having an outer surface;
- a primary winding being wound around said outer surface of said jacket and connected to said feed source; and
- a secondary winding wound around said middle leg;
- said primary winding and said secondary winding being connected in opposite directions in series for supplying alternating voltages at said windings forming a differential voltage having a phase relationship relative to the feed voltage determining the output signal; and

a load in the form of a disk being electrically conducting and magnetically non-conducting, said disk being coupled to the magnetic flux by means of said middle leg.

5,463,260
TRIGGER DEVICE FOR TRIGGERING A PASSIVE RESTRAINT DEVICE IN A CAR

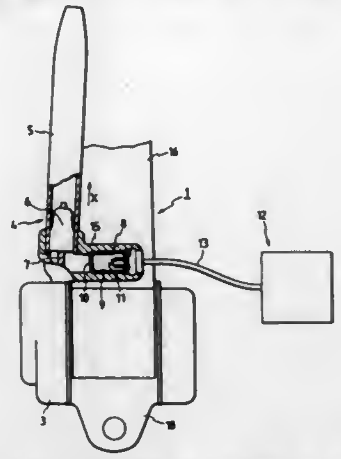
Katsuyasu Ono, Kanagawa, Japan, assignor to NSK Ltd., Tokyo, Japan

Filed Oct. 20, 1993, Ser. No. 139,104

Claims priority, application Japan, Jan. 20, 1993, 5-004044 U

Int. Cl.⁶ H01H *35/14*; B60K *28/10*; B60R *21/32*

U.S. Cl. 307—121 **13 Claims**



1. A trigger device operable in response to an acceleration exceeding a predetermined value to ignite a gas generator in a vehicle, the trigger device comprising:

a power supply;

an electric ignition device coupled to the gas generator;

switch means connected between the electric ignition device and the power supply to selectively energize the electric ignition device;

a moveable magnet moveable between a first position, wherein the switch means is operated to energize the electric ignition device, and a second position wherein the switch means is not operated; and

a fixed magnet fixedly mounted to a frame of the vehicle to bias the moveable magnet toward the second position by a magnetic force acting between a first magnetic pole of the movable magnet and a second magnet pole of the fixed magnet, the first magnetic pole of the movable magnet adjoining the second magnetic pole of the fixed magnet;

wherein the movable magnet is disposed proximate the fixed magnet so that the movable magnet is inertially moved toward the first position against the magnetic force when acceleration is applied to the movable magnet continuously for at least a predetermined period of time.

5,463,261
POWER CONSERVATION DEVICE FOR A PERIPHERAL INTERFACE MODULE

Louis J. Skarda, Lake Elmo; Stanley H. Miller, Stillwater, and Timothy L. McCullough, Mahtomedi, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 19, 1994, Ser. No. 325,578

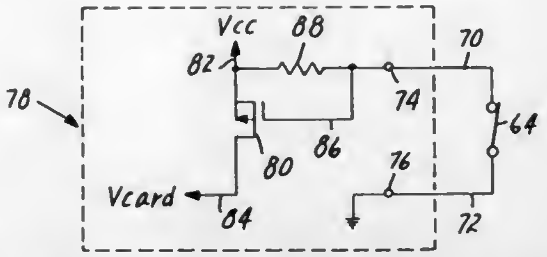
Int. Cl.⁶ H02H *5/00*

U.S. Cl. 307—131 **40 Claims**

1. A power conservation device for a peripheral interface module configured for use in an electronic device, said module having a housing, peripheral interface hardware mounted within said housing, a socket, mounted within said housing and electrically coupled to said peripheral interface hardware, for being engaged by a peripheral device plug and electrically coupling the peripheral device plug to said peripheral interface hardware, and a module power terminal for receiving power from an electronic device power terminal associated with said electronic device when said module is coupled to said electronic device, and for providing said power to said peripheral interface hardware, said power conservation device comprising:

sensing means for sensing whether said peripheral device plug engages said socket; and

switching means, responsive to said sensing means, for disconnecting said module power terminal from said electronic device power terminal when said peripheral device plug does not engage said socket, and connecting said module power terminal to said electronic device power terminal when said peripheral device plug engages said socket.



5,463,262
ROTOR FOR SYNCHRONOUS MOTOR

Hiroyuki Uchida, Yamanashi, Japan, assignor to Fanuc, Ltd., Yamanishi, Japan

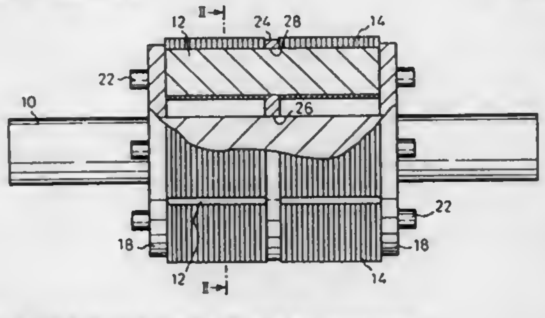
PCT No. PCT/JP93/00248, § 371 Date Oct. 25, 1993, § 102(e) Date Oct. 25, 1993, PCT Pub. No. WO93/17483, PCT Pub. Date Sep. 2, 1993

PCT Filed Feb. 26, 1993, Ser. No. 133,165

Claims priority, application Japan, Feb. 28, 1992, 4-042523

Int. Cl.⁶ H02K *21/12*

U.S. Cl. 310—156 **9 Claims**



1. A rotor for a synchronous motor, comprising:

a rotating shaft;

a plurality of permanent magnets radially arranged around said rotating shaft, with a gap between each permanent magnet and said shaft, and extending in an axial direction;

a plurality of laminated core members formed by axially stacking magnetic thin-plate cores, and arranged around said rotating shaft while holding each permanent magnet therebetween so as to constitute magnetic poles;

a pair of end plates arranged at both axial ends of said permanent magnets and said laminated core members, and fixed to said rotating shaft;

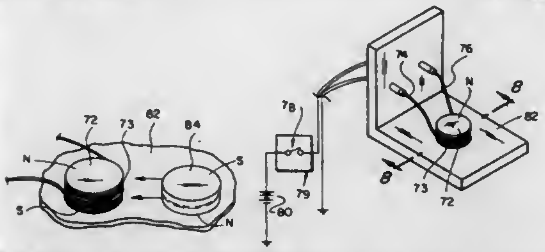
a plurality of rod members passing through each of said laminated core members in the axial direction, and connected to said end plates at both ends of the rod members; and

a fastening means for fastening said permanent magnets between adjacent laminated core members at predetermined positions in a radial direction;

wherein said fastening means includes at least one non-magnetic circular-plate member arranged at a predetermined position in a laminated construction of said laminated core members; said circular-plate member being provided with a shaft hole into which said rotating shaft is substantially close fitted, rod-supporting holes arranged around said shaft hole, into which said rod members are inserted, and magnet-fastening holes arranged around said shaft hole separate from said shaft hole and said rod-supporting holes, into which said permanent magnets are inserted; said magnet-fastening holes being formed in and passing through said circular-plate member while having peripheral edge portions adapted to abut on at least radial outer and inner surfaces of said permanent magnets at positions substantially corresponding to said permanent magnets.

5,463,263
PERMANENT MAGNET CONTROL MEANS

Charles J. Flynn, Kansas City, Mo., assignor to Magnetic Revolutions Limited L.L.I., St. Louis, Mo.
Division of Ser. No. 828,703, Jan. 31, 1992, Pat. No. 5,254,925.
This application Aug. 11, 1993, Ser. No. 104,783
Int. Cl.^{6} H02K *23/04;29/10;11/00;1/27*
U.S. Cl. 310—181 **14 Claims**



1. A device to control the magnetic properties of a permanent magnet including the ability of the permanent magnet to magnetically interact with another permanent magnet comprising:

first and second permanent magnets having north and south poles,

a coil of conductive metal wound about the first permanent magnet intermediate the north and south poles,

the first permanent magnet having north and south poles lying in a first plane, the second permanent magnet having north and south poles lying in a second plane that is substantially parallel to the first plane,

means to control the linear movement of the second permanent magnet in a plane perpendicular to the first and second planes caused by the magnetic interaction between the first permanent magnet and the second permanent magnet including

a source of direct current energy and switch means connected in series therewith across the coil whereby when the switch means are closed the direct current source is applied across the coil whereby the magnetic flux of the first permanent magnet changes the ability of the first permanent magnet to interact with the second permanent magnet.

5,463,264
CONSTANT FORCE BRUSH HOLDER ASSEMBLY

Jeff D. Koenitzer, Brookfield, Wis., assignor to Helwig Carbon Products, Inc., Milwaukee, Wis.
Filed Jul. 19, 1994, Ser. No. 277,036
Int. Cl.^{6} H02K *13/00*
U.S. Cl. 310—242 **5 Claims**

1. A brush holder assembly for use with a dynamo electric machine comprising:

a cylindrical container mounted in a housing of said machine and having an opening extending radially inward toward a commutator of said machine;

a U-shaped retainer slidably positioned within said container with legs of said U-shaped retainer extending radially inward towards the commutator of said machine;

inner sides of each of said legs having a recess near ends of said legs;

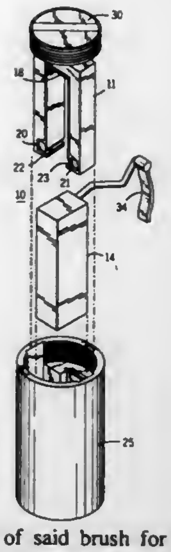
a brush positioned between said legs of said retainer;

a constant force spring positioned between said brush and on inner surface of said retainer;

said spring having a pair of end coils located in said recesses in the inner surface of said retainer legs and a middle portion for engaging one end of said brush for resiliently urging said brush against the commutator of said dynamo electric machine with a constant force;

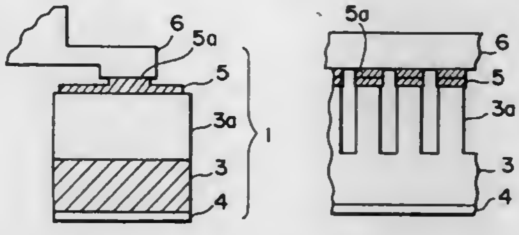
said container having two internal longitudinally extending slots for receiving and positioning said retainer and said brush; and

a removable cap positioned in a radially outer end of said container for keeping said retainer, spring and brush within said container during operation of said machine.



5,463,265
VIBRATION DRIVEN MOTOR

Koji Kitani, Chofu, and Tohru Nakanishi, Yokohama, both of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 263,491, Jun. 21, 1994, abandoned, which is a continuation of Ser. No. 879,415, May 7, 1992, abandoned. This application Apr. 12, 1995, Ser. No. 420,630
Claims priority, application Japan, May 8, 1991, 3-102831
Int. Cl.^{6} H01L *41/08*
U.S. Cl. 310—323 **22 Claims**



1. A vibration driven motor comprising:

a vibration member for producing a vibration wave therein in response to an electrical signal, said vibration member having a plurality of comb-shaped projections along a direction of travel of said vibration wave, one end of each of said comb-shaped projections including a contact portion further projecting from said comb-shaped projection; and

a contact member having a contact portion contacting the contact portions of said comb-shaped projections, said vibration wave causing relative movement between said vibration member and said contact member;

wherein a lateral width of each contact portion of said comb-shaped projections is smaller than a width of the contact portion of said contact member and a width of each comb-shaped projection, and wherein a hardness of the contact portions of the comb-shaped projections of the vibration member is lower than a hardness of the contact portion of the contact member.

5,463,266

PIEZOELECTRIC TRANSFORMER HAVING IMPROVED ELECTRODE ARRANGEMENT

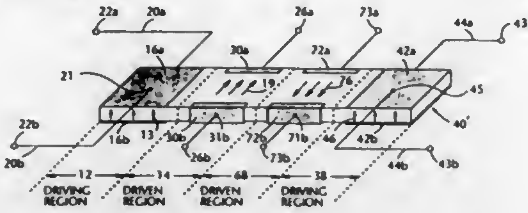
Akira Fukuoka; Jun Kawai, and Satoru Tagami, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Jan. 3, 1994, Ser. No. 177,069

Claims priority, application Japan, Dec. 31, 1992, 4-360174

Int. Cl.^{6} H01L *41/08*

U.S. Cl. 310—359 **7 Claims**



1. A piezoelectric transformer comprising:

a long relatively thin rectangular body of piezoelectric material, said body having first and second major surfaces and exhibiting a resonance mode of vibration at a predetermined frequency in a longitudinal direction thereof, said body being divided into a plurality of regions in said longitudinal direction,

first and second electrodes applied respectively to said first and second major surfaces of a first region of said plurality of regions, said first region being polarized in a thickness direction of said body; and

third and fourth electrodes which are formed such as to respectively cover opposite side surfaces of a second region of said plurality of regions in a plane parallel to said longitudinal direction of said body and to respectively extend inwardly in a transverse direction of said body by a predetermined amount over said first and second major surfaces of said second region, said second region being polarized in a direction perpendicular to said longitudinal direction,

wherein said plurality of regions further include:

a third region which is provided outside of said second region, said third region being provided with fifth and sixth electrodes applied respectively to said first and second major surfaces of said third region, said third region being polarized in a thickness direction of said body, and

a fourth region which is provided between said second and third regions, said fourth region being provided with seventh and eighth electrodes which are formed such as to respectively cover opposite side surfaces of said fourth region in a plane parallel to said longitudinal direction of said body and to respectively extend inwardly in a transverse direction of said body by a predetermined amount over said first and second major surfaces of said fourth region, said fourth region being polarized in a direction perpendicular to said longitudinal direction.

5,463,267

SPARK PLUG WITH AUTOMATICALLY ADJUSTABLE GAP

Scott R. Conway, Lafayette, Ind., assignor to Caterpillar Inc., Peoria, Ill.

Continuation of Ser. No. 85,784, Jul. 6, 1993, abandoned. This application Jan. 10, 1995, Ser. No. 371,051

Int. Cl.^{6} H01T *13/26*

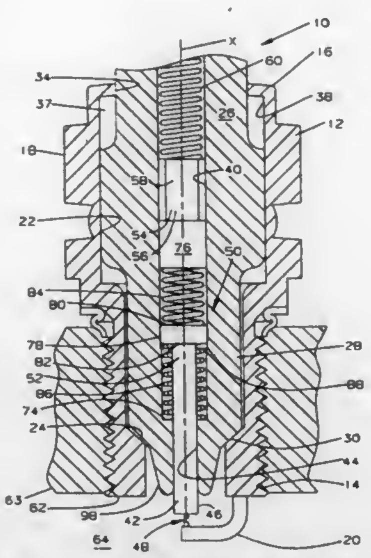
U.S. Cl. 313—141 **16 Claims**

1. A spark plug assembly adapted for use with an internal combustion engine, comprising:

an outer shell defining a ground member;

an insulator member secured within the outer shell;

an electrode member secured within the insulator member in a manner wherein a first end portion of the electrode extends from the insulator to a position that is adjacent the ground member to define a gap therebetween; and



means for adjusting the dimension of the gap between the electrode and the ground member, said adjusting means being adapted to move the electrode in a linear direction with respect to the insulator toward and away from the ground member in response to the operation of the engine.

5,463,268

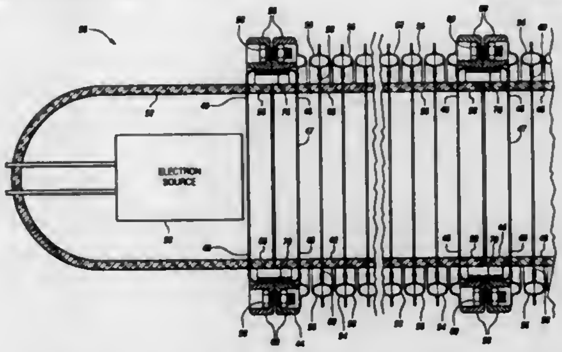
MAGNETICALLY SHIELDED HIGH VOLTAGE ELECTRON ACCELERATOR

James B. Schroeder, Madison, Wis., assignor to National Electrostatics Corp., Middleton, Wis.

Filed May 23, 1994, Ser. No. 247,261

Int. Cl.^{6} H02N *1/00*

U.S. Cl. 313—293 **16 Claims**



13. In combination with a high voltage electron accelerator of the type having an electron source a high voltage vacuum tube for accelerating electrons composed of segments of connected axially spaced annular insulating elements and annular voltage-carrying elements each segment having a segment attachment ring, such that adjacent segments of the vacuum tube are connected at joints defined between adjacent segment attachment rings, and wherein each voltage-carrying element has a spark arrester attached thereto, the improvement comprising:

a) forming the spark arrester of a high magnetic permeability material; and

b) a ring of high magnetic permeability material positioned across the joints between the segment attachment rings to form a magnetic shield which extends along the vacuum tube.

5,463,269

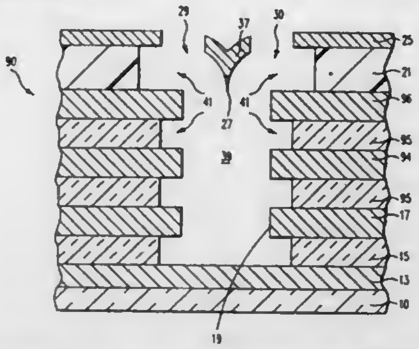
PROCESS AND STRUCTURE OF AN INTEGRATED VACUUM MICROELECTRONIC DEVICE

Steven M. Zimmerman, Pleasant Valley, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 555,214, Jul. 18, 1990, abandoned. This application Mar. 6, 1992, Ser. No. 847,444

Int. Cl.^{6} H01J *1/00*

U.S. Cl. 313—309 **29 Claims**



1. An integrated vacuum microelectronic device comprising an electron-emitting material having at least one field emission tip and at least one access hole that leads into a chamber, wherein said field emitter tip faces an anode which is in said chamber and is separated by at least one insulating material, and wherein at least a portion of said at least one access hole in said electron-emitting material faces said anode.

5,463,270

INSULATING BASE FOR DISCHARGE LAMP DEVICE

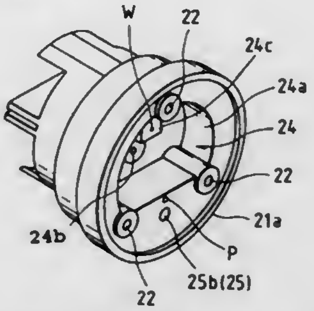
Yukio Wakimizu; Kunimasa Motiduki, and Masakazu Nagasawa, all of Shizuoka, Japan, assignors to Koito Manufacturing Co., Ltd., Tokyo, Japan

Filed Feb. 14, 1994, Ser. No. 195,442

Claims priority, application Japan, Feb. 16, 1993, 5-026814

Int. Cl.^{6} H01J *5/48*

U.S. Cl. 313—318.01 **6 Claims**



1. An insulating base for a discharge lamp device comprising a generally disk-shaped base main body molded of synthetic resin having formed therein a lead support insertion hole for mounting a lead support for supporting a front end portion of an arc tube and providing a current path to a lead on a front end of said arc tube, and a lead insertion hole formed in a front surface of said base main body for insertion of a lead disposed on a rear side of said arc tube, the improvement wherein a separation wall is formed in said base main body between said lead support insertion hole and said lead insertion hole, and wherein at least one gate mark is disposed on a face of said separation wall as a result of a molding operation in which at least one resin injection gate opposes said face so that there are no gate marks on the outer periphery of said base main body.

5,463,271

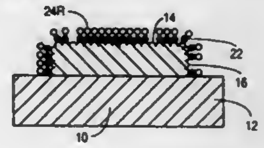
STRUCTURE FOR ENHANCING ELECTRON EMISSION FROM CARBON-CONTAINING CATHODE

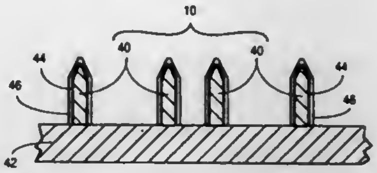
Michael W. Geis, Acton, Mass.; John M. Macaulay, Palo Alto, Calif., and Jonathan C. Twichell, Acton, Mass., assignors to Silicon Video Corp., Cupertino, Calif., and Massachusetts Institute of Technology, Cambridge, Mass.

Filed Jul. 9, 1993, Ser. No. 90,228

Int. Cl.^{6} H01J *1/30; 19/24*

U.S. Cl. 313—346 R **24 Claims**





3. An emissive cathode structure comprising:

at least one carbon-containing cathode having an electron-emissive surface, the cathode being at least 50 atomic percent carbon along the electron-emissive surface;

electronegative atoms chemically bonded to the cathode along a specified area of the electron-emissive surface, the electronegative atoms comprising at least one of oxygen and fluorine; and

atoms of electropositive metal chemically bonded to the electronegative atoms along the specified area.

5,463,272

CATHODE FOR PHOTOELECTRIC EMISSION, CATHODE FOR SECONDARY ELECTRON EMISSION, ELECTRON MULTIPLIER TUBE, AND PHOTOMULTIPLIER TUBE

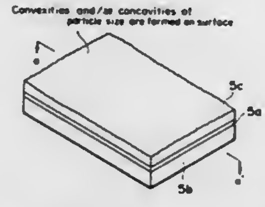
Yasushi Watase; Masao Kinoshita; Hiroyuki Watanabe; Takeo Hashimoto; Takehiro Iida, and Hiroaki Washiyama, all of Hamamatsu, Japan, assignors to Hamamatsu Photonics K.K., Hamamatsu, Japan

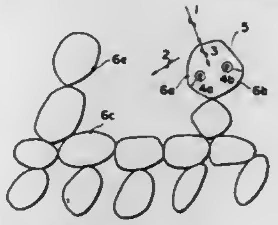
Filed Oct. 4, 1993, Ser. No. 130,897

Claims priority, application Japan, Jan. 5, 1992, 4-266235

Int. Cl.^{6} H01J *1/32*

U.S. Cl. 313—373 **13 Claims**


Convexities and/or concavities of particle size are formed on surface
5c
5a
5b



12. An electron multiplier tube comprising:

a vacuum container;

a cathode for secondary electron emission comprising:

a base substrate; and

a thin film formed on a surface of the base substrate and having a region for receiving an incident electron, the thin film comprising a material for emitting secondary electrons in response to the incident electron and including a plurality of particles, each having an average particle size of 200 nm to 2000 nm, which form convexities and/or concavities on the region; and

an anode for collecting an electron emitted from the cathode for secondary electron emission, located inside of the vacuum container.

5,463,273

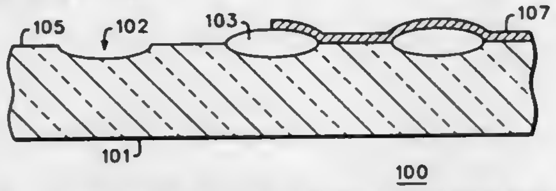
DIMPLED IMAGE DISPLAY FACEPLATE FOR RECEIVING MULTIPLE DISCRETE PHOSPHORE DROPLETS AND HAVING CONFORMAL METALLIZATION DISPOSED THEREON

Yumiko Kato, Mesa; James E. Jaskie, Scottsdale, and David A. Wiemann, Higley, all of Ariz., assignors to Motorola, Schaumburg, Ill.

Filed May 4, 1994, Ser. No. 237,818

Int. Cl.^{6} H01J *29/18*

U.S. Cl. 313—461 **5 Claims**



1. An image display faceplate comprising a major surface and a plurality of uniform recessed regions oriented to provide a prescribed pattern and extending into the faceplate, each of the recessed regions being formed as a dimple with a diameter, a depth and gradually sloped edge and with the diameter of each dimple being significantly greater than the depth, and the faceplate further including a plurality of dis-similar phosphor materials with a different phosphor material of the plurality, of dis-similar phosphor materials disposed in each recessed region.

5,463,274

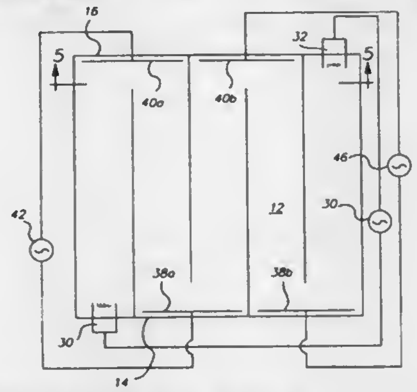
PLANAR FLUORESCENT LAMP HAVING A SERPENTINE CHAMBER AND SIDEWALL ELECTRODES

Mark D Winsor, Olympia, Wash., assignor to Winsor Corporation, Seattle, Wash.

Continuation of Ser. No. 990,068, Dec. 14, 1992, now Defensive Publication No. This application Aug. 12, 1994, Ser. No. 289,377

Int. Cl.^{6} H01J *17/04;61/067*

U.S. Cl. 313—493 **19 Claims**



1. A planar fluorescent lamp comprising:

a sealed chamber formed by a pair of sidewalls, a pair of end walls, a top plate, and a bottom plate;

a gas within the sealed chamber, the gas being active to emit ultraviolet energy in response to an electric plasma arc therethrough;

a plurality of divider walls extending from each of said sidewalls and from the bottom plate to the top plate to create a serpentine path having a plurality of turns within the sealed chamber;

a electrode at each end of the serpentine path of the sealed chamber positioned for creating the electric plasma arc within the sealed chamber between the electrodes; and

a first sidewall electrode positioned adjacent a first one of the sidewalls, the first sidewall electrode having an electric terminal that is adapted to be connected to a voltage source, the first sidewall electrode further being positioned to modify the shape of the electric plasma arc within the sealed chamber at a corresponding first one of the turn in response to an input voltage from the voltage source.

5,463,275

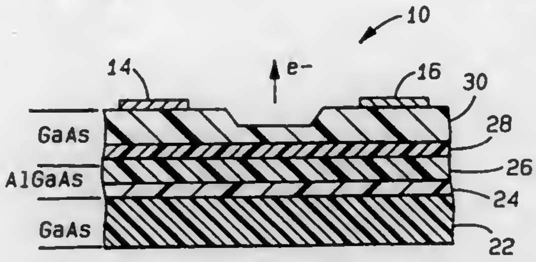
HETEROJUNCTION STEP DOPED BARRIER CATHODE EMITTER

Chung-Hsu Chen, and Huan-Chun Yen, both of Torrance, Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Jul. 10, 1992, Ser. No. 911,581

Int. Cl.^{6} H01J *1/30*

U.S. Cl. 313—495 **16 Claims**



1. A semiconductor device operable to be used in a vacuum microelectronic device, said semiconductor device comprising:

a first semiconductor region being substantially constituted of a first semiconductor material;

a second semiconductor region being positioned adjacent to and in contact with the first semiconductor region, said second region being substantially constituted of a second semiconductor material, wherein said second semiconductor region includes a p-type doped layer; and

a third semiconductor region being substantially constituted of the first semiconductor material, said third semiconductor region being positioned adjacent to and in contact with the second semiconductor region and opposite to the first semiconductor region, said third semiconductor region including a p-type doped layer being positioned adjacent to and in contact with the p-type doped layer of the second semiconductor region, wherein a maximum conduction band energy level of the second semiconductor region is greater than a maximum conduction band energy level for the third semiconductor region and wherein the conduction band energy level of the p-type doped layer of the third semiconductor region is greater than a layer of the third semiconductor region adjacent to the p-type doped layer of the third semiconductor region such that the semiconductor device is operable to emit electrons from the third semiconductor region.

5,463,276

DOUBLE-FACED VACUUM FLUORESCENT DISPLAY

Hiroaki Kawasaki; Hiroshi Sakurada; Shinichi Narushima; Tadashi Iwasa, and Hiroshi Yamaguchi, all of Mobara, Japan, assignors to Futaba Corporation, Mobara, Japan

Filed Nov. 18, 1993, Ser. No. 154,031

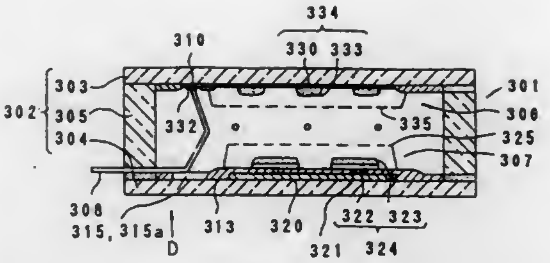
Claims priority, application Japan, Nov. 19, 1992, 4-80061 U; Dec. 2, 1992, 4-83276 U; Dec. 3, 1992, 4-83506 U; Apr. 28, 1993, 5-22655 U; Aug. 31, 1993, 5-47408 U

Int. Cl.^{6} H01J *1/62*

U.S. Cl. 313—496 **10 Claims**

1. A double-faced vacuum fluorescent display, comprising:

an outer casing including a base plate, a transparent front plate situated in front of the base plate, and a side member situated between the base plate and the front plate to form a space therebetween,



a first display portion mounted on the base plate at an inner side of the outer casing, said first display portion including a wiring pattern situated on the base plate, an insulating layer with light shielding property disposed on the wiring pattern, a first anode conductor disposed on the insulating layer and connected to the wiring pattern, and a first fluorescent layer disposed on the first anode conductor, a display on the first display portion being able to see only from a side of the front plate, and

a second display portion mounted on the transparent front plate at the inner side of the outer casing, said second display portion including a second anode conductor with transparency situated on the front plate and a second fluorescent layer disposed on the second anode conductor, and having a light transmitting portion for observing the first display portion therethrough so that light by the first fluorescent layer is observed from the light transmitting portion through the transparent front plate, and light by the second fluorescent layer is seen through the transparent front plate and the second anode conductor.

5,463,277

MICRO VACUUM DEVICE

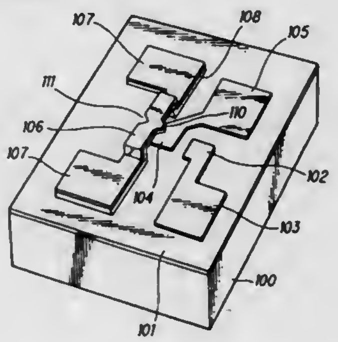
Mitsuteru Kimura, Miyagi, and Masato Honma, Yamagata, both of, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Dec. 6, 1993, Ser. No. 161,609

Claims priority, application Japan, Dec. 7, 1992, 4-326383; Nov. 30, 1993, 5-329952

Int. Cl.^{6} G09G *3/10*

U.S. Cl. 315—169.1 **37 Claims**



1. A micro vacuum device having an electron emitter, a gate, and a collector each provided in a vacuum, wherein said electron emitter is formed into a thin film form on a thin film heater rising in midair and said electron emitter is a provided over a portion of said gate with a space therebetween so that said electron emitter causes field emission of electrons.

5,463,278

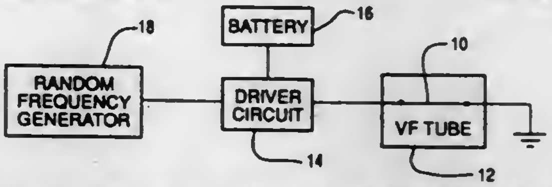
METHOD AND APPARATUS FOR RANDOM FREQUENCY OF TUBE FILAMENT CURRENT

Craig S. Gray, Walton, Ind., assignor to Delco Electronics Corporation, Kokomo, Ind.

Filed Aug. 1, 1994, Ser. No. 283,323

Int. Cl.^{6} H05B *37/02*

U.S. Cl. 315—169.1 **13 Claims**



1. In a drive circuit for a filament of a vacuum fluorescent tube, a method of providing a pulsed filament current at low radiated emissions comprising the steps of:

generating a random frequency signal variable throughout a range above audible frequencies;

establishing a pulse width and voltage to effect a required filament power; and

applying pulses to the filament at the random frequency, whereby radiated emissions are distributed over a frequency band.

5,463,279

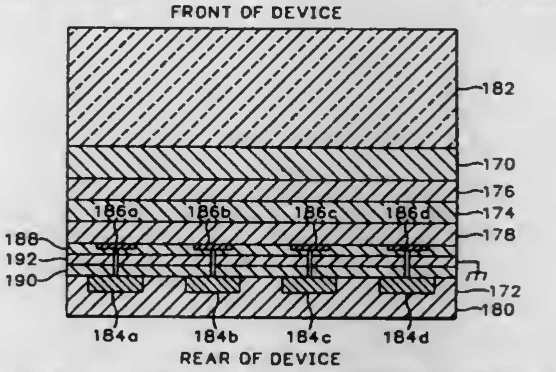
ACTIVE MATRIX ELECTROLUMINESCENT CELL DESIGN

Iranpour Khormaei, Beaverton, Oreg., assignor to Planar Systems, Inc., Beaverton, Oreg.

Filed Aug. 19, 1994, Ser. No. 293,144

Int. Cl.^{6} H01J *9/00*

U.S. Cl. 315—169.3 **24 Claims**



12. In an electroluminescent device comprising a plurality of layers including at least a transparent electrode layer, a circuit layer, and at least three layers including an electroluminescent layer sandwiched between front and rear dielectric layers, all three layers thereof disposed between said circuit layer and said transparent electrode layer the improvement comprising:

(a) said circuit layer deposited on a rearwardly disposed substrate;

(b) at least three additional layers, including a ground plane sandwiched between front and rear insulator layers, all three layers thereof disposed between said rear dielectric layer and said circuit layer;

(c) said circuit layer further including:

(i) a first gating device coupled to a data line and a select line and having an output coupled to an input of a charge storage device, said charge storage device having a terminal connected to said substrate;

(ii) a second gating device comprising a transistor operating in a breakdown region, said transistor having a gate coupled to said input to said charge storage device and having a first terminal coupled to said ground plane and a second terminal coupled to a pixel electrode; and

(d) said transparent electrodes carrying an electrical signal such that upon activation of said second gating device an electric field is generated between said transparent electrode layer and said pixel electrode so as to cause said electroluminescent layer to emit light.

5,463,280

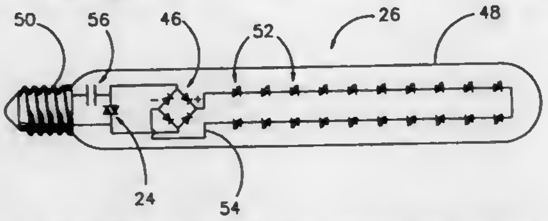
LIGHT EMITTING DIODE RETROFIT LAMP

James C. Johnson, Conyers, Ga., assignor to National Service Industries, Inc., Atlanta, Ga.

Filed Mar. 3, 1994, Ser. No. 206,594

Int. Cl.^{6} H05B *37/02*

U.S. Cl. 315—187 **8 Claims**



1. A lamp capable of operation on standard line voltages and particularly useful as a replacement lamp in an emergency exit sign and the like, comprising:

a plurality of light emitting diodes arranged in series and comprising a circuit locatable within the spatial confines of the lamp;

means disposed in the circuit for limiting current through the light emitting diodes, said means comprising a capacitor acting as the only effective limiting impedance in the circuit; and,

a diode bridge disposed in the circuit between the light emitting diodes and the capacitor.

5,463,281

CIRCUIT ARRANGEMENT FOR OPERATING A HIGH-PRESSURE DISCHARGE LAMP

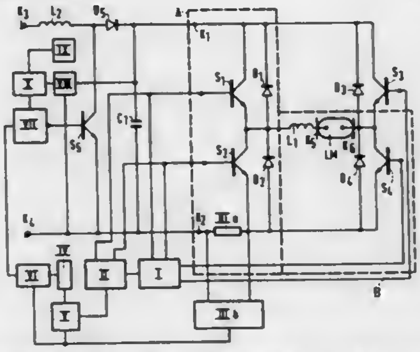
Henricus M. H. Linssen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 964,680, Oct. 21, 1992, abandoned. This application Mar. 7, 1994, Ser. No. 207,899

Claims priority, application European Pat. Off., Nov. 13, 1991, 91202945

Int. Cl.^{6} H05B *37/02*

U.S. Cl. 315—209 R **16 Claims**



10. A circuit arrangement for operating a discharge lamp, including a DC-AC converter comprising:

a first pair of transistors coupled to receive a DC voltage, each transistor being switchable into a conducting state and a non-conducting state;

a load branch shunting one of said transistors and including lamp connection terminals;

first drive means coupled to said first transistor pair for switching each transistor of said first transistor pair alternately into its conducting state at a first switching frequency such that both transistors of said first transistor pair are not in their conducting states concurrently; and

second drive means for switching one of said transistors of said first transistor pair at a frequency higher than the first switching frequency while the other of said transistors of said first transistor pair is in its non-conducting state.

5,463,282

ELECTRONIC SUPPLY FOR IGINITING AND OPERATING A HIGH/PRESSURE DISCHARGE LAMP

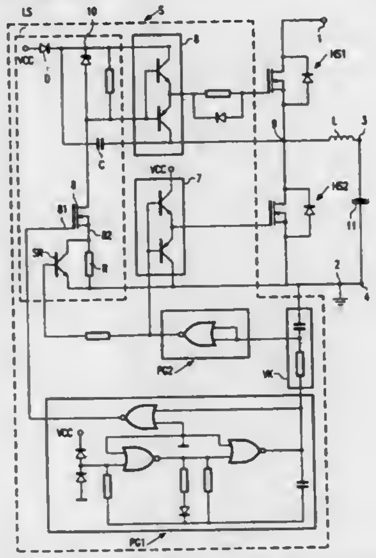
Machiel A. M. Hendrix, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 27, 1994, Ser. No. 250,079

Claims priority, application European Pat. Off., Jun. 1, 1993, 93201549.8

Int. Cl.^{6} H05B *41/36*

U.S. Cl. 315—209 R **20 Claims**



1. An electronic supply for igniting and operating a high-pressure discharge lamp, comprising: first driven main switching means for generating a high-frequency current through inductive means, a second driven main switching means, switching means for the subsequent supply of current through the inductive means when the first driven main switching means are in the non-conducting state, a transformerless level shifter coupled to at least one of said first and second driven main switching means, a driver circuit with at least switch drive means for driving the first driven main switching means, wherein said switching means for the subsequent current supply comprise a part of the second driven main switching means which provide periodic commutation of current through the inductive means, and wherein the level shifter is free of self-induction means.

5,463,283

DRIVE CIRCUIT FOR ELECTROLUMINESCENT LAMP

Stephen J. Sanderson, Royersford, Pa., assignor to BKL, Inc., King of Prussia, Pa.

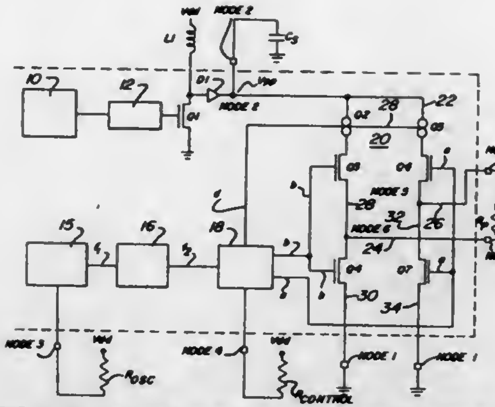
Filed May 24, 1994, Ser. No. 248,299

Int. Cl.^{6} H05B *37/02*

U.S. Cl. 315—209 R **19 Claims**

1. A DC to AC inverter for illuminating an electroluminescent lamp manifesting a parallel resistance-capacitance in series with a resistance, said device comprising:

connector means for receiving said lamp;



DC to DC converter means having inductive means and capacitive means configured for generating a relatively high, first DC voltage of a given value from a relatively low, second DC voltage;

constant current source coupled to said DC to DC converter for providing switching means with said first DC voltage at a selected, constant current; and

switching means coupled to said constant current source for applying alternating polarity signals of said high DC voltage at said constant current to said connector means such that said lamp sees an AC voltage, said AC voltage alternately charging and discharging said lamp, said constant current resulting in a ramp voltage waveform during said charging.

5,463,284

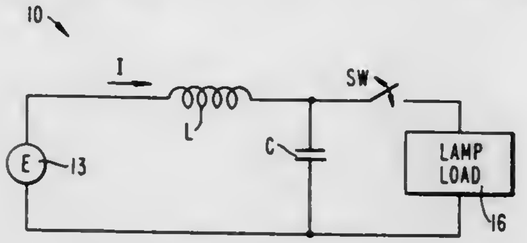
LAMP BALLAST CIRCUIT CHARACTERIZED BY A SINGLE RESONANT FREQUENCY SUBSTANTIALLY GREATER THAN THE FUNDAMENTAL FREQUENCY OF THE INVERTER OUTPUT SIGNAL

Charles B. Mattas, Glenview, Ill., assignor to North American Philips Corporation, New York, N.Y.

Continuation of Ser. No. 932,840, Aug. 20, 1992, abandoned. This application Oct. 26, 1994, Ser. No. 329,700

Int. Cl.^{6} H05B *37/00*

U.S. Cl. 315—240 **27 Claims**



1. A ballast circuit for generating a driving signal sufficient to ignite a lamp load, comprising:

inductor means adapted to exhibit the properties of inductance;

a capacitor for providing the driving signal and serially connected to said inductor means so as to form a serially connected inductor-capacitor circuit; and

generating means for applying a generated signal to the circuit, said generated signal having at least a fundamental frequency;

wherein the inductor means and capacitor are characterized by a single resonant frequency which is at least $\sqrt{5}$ times but less than three times greater than the fundamental frequency.

5,463,285

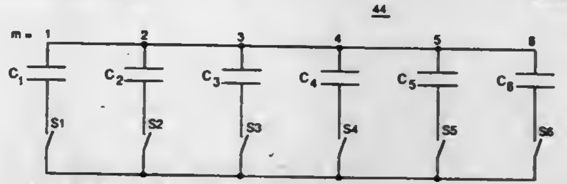
VARIABLE CAPACITOR WITH VERY FINE RESOLUTION

Sayed-Amr El-Hamamsy, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 14, 1994, Ser. No. 209,290

Int. Cl.^{6} H05B *41/16*

U.S. Cl. 315—248 **7 Claims**



1. A variable capacitor, comprising:

a binary capacitance ladder comprising a plurality N of parallel connected branches and having a predetermined resolution ΔC, each of said branches comprising a fixed capacitor of capacitance C_n coupled in series with a switch having a parasitic capacitance C_n' when open, adjacent branches being numbered sequentially, n being the number of a respective branch, said binary capacitance ladder having a maximum total capacitance C_{Total} given by:

$$C_{Total}=C_1+C_2+\ldots+C_n,$$

each respective branch having a variation in capacitance ΔC_n due to opening and closing of the respective switch S_n therein given by:

$$\Delta C_n = C_n - \frac{C_n C_n'}{C_n + C_n'} = 2^{n-1}\Delta C,$$

such that said binary capacitance ladder has a total capacitance variation between values of C_{Total} and $C_{Total}-(2^N-1)\Delta C$ in steps of ΔC, said variable capacitor further comprising an additional fixed capacitor coupled in parallel with at least one said switch, such that the capacitance C_n of said switch includes the capacitance of said additional fixed capacitor.

5,463,286

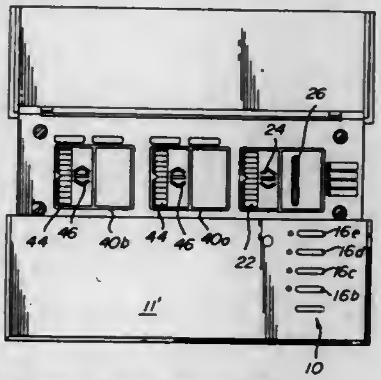
WALL MOUNTED PROGRAMMABLE MODULAR CONTROL SYSTEM

Michael J. D'Aleo, Erwinna; Jonathan H. Ference, Riegelsville; Simo P. Hakkarainen, Bethlehem; Joel S. Spira, Coopersburg, and Darryl W. Tucker, Foglesville, all of Pa., assignors to Lutron Electronics, Co., Inc., Coopersburg, Pa.

Division of Ser. No. 743,244, Aug. 9, 1991, Pat. No. 5,191,265. This application Feb. 24, 1993, Ser. No. 22,257

Int. Cl.^{6} H05B *37/02*

U.S. Cl. 315—295 **1 Claim**



1. A lighting control system comprising:

a wall mountable master control unit for controlling a first lighting load, said master control unit comprising a housing which supports a plurality of pushbutton switches for selecting one of a plurality of stored power levels to be delivered to the first lighting load, each stored power level defining a scene, and an actuator for setting desired power levels to be delivered to the first lighting load, and further comprising a built in infra-red signal receiver for receiving infra-red commands and being responsive thereto to either select one of the scenes or set a desired power level; and,

at least one wall mountable slave control unit for controlling a second lighting load, the slave being ganged with, and coupled to communicate with, the master, the slave having an actuator for setting desired power levels to be delivered to the second lighting load for each scene;

the master transmitting data indicative of at least the received infra-red commands to the slave, the slave being responsive to the data to alter the power level delivered to the second lighting load in accordance with the commands.

5,463,287

DISCHARGE LAMP LIGHTING APPARATUS WHICH CAN CONTROL A LIGHTING PROCESS

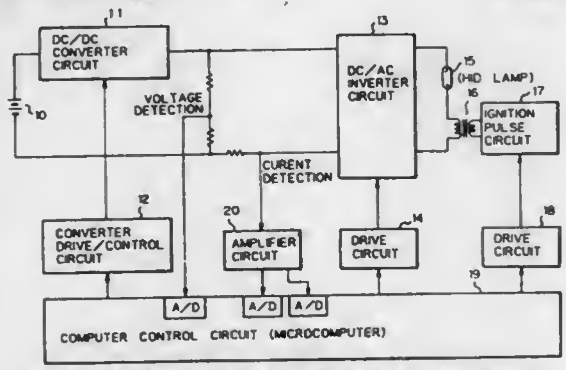
Makoto Kurihara, Tokyo, and Masaru Wasaki, Chiba, both of, Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Oct. 5, 1994, Ser. No. 318,361

Claims priority, application Japan, Jan. 6, 1993, 5-272982; Jan. 27, 1993, 5-289839; Jan. 27, 1993, 5-289840; Jan. 27, 1993, 5-289841; Jan. 28, 1993, 5-291505

Int. Cl.^{6} G05F *1/00*

U.S. Cl. 315—308 **15 Claims**



1. A lighting apparatus for a discharge lamp, comprising:

a power adjustment means for adjusting electrical power to be supplied to the discharge lamp;

an ignition pulse production means for producing at least one ignition pulse to be applied to the discharge lamp;

a detection means for detecting a lighting condition of the discharge lamp; and

a computer control means electrically connected with said power adjustment means, said ignition pulse production means and said detection means, said computer control means controlling said power adjustment means and said ignition pulse production means so that at first said power adjustment means supplies an idling voltage to the discharge lamp, then said ignition pulse production means lights up the discharge lamp by applying at least one ignition pulse to the discharge lamp, and thereafter said power adjustment means controls lamp power of the discharge lamp to a target lamp power,

said detection means including a current detection means for detecting a current corresponding to a lamp current of the discharge lamp to output a first signal which represents the detected current and a voltage detection means for detecting a voltage corresponding to a lamp voltage of the discharge lamp to output a second signal which represents the detected voltage,

said computer control means calculating a lamp power of the discharge lamp from said first and second signals to produce a control signal for controlling said power adjustment means in accordance with the calculated lamp power, and stopping power supply to the discharge lamp from said power adjustment means if it is judged that said calculated lamp power exceeds a predetermined allowable power.

5,463,288

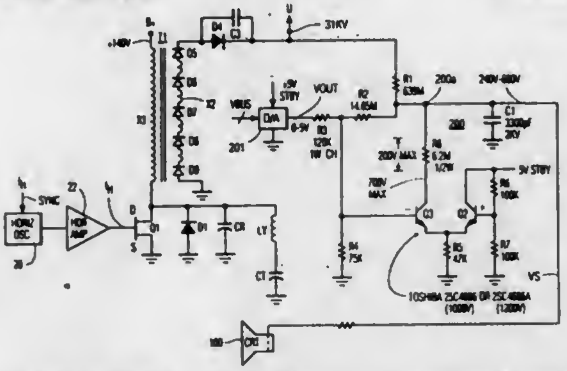
BUS CONTROLLED ELECTRODE VOLTAGE FOR A CATHODE RAY TUBE

John B. George, Carmel, and Lawrence E. Smith, Indianapolis, both of Ind., assignors to Thomson Consumer Electronics, Inc., Indianapolis, Ind.

Filed Sep. 3, 1993, Ser. No. 115,609

Int. Cl.^{6} G09G *1/04;* **H01J** *29/52*

U.S. Cl. 315—382 **3 Claims**



1. A video display apparatus for selectively controlling a voltage in an electrode of an electron gun in a cathode ray tube, comprising:

means for generating a control signal that is indicative of a required magnitude of said electrode voltage;

a source of a first voltage; and

an amplifier responsive to said control signal and coupled to said source of first voltage for generating said electrode voltage, said amplifier including a pair of transistors that are coupled in a cascode configuration for developing a first portion of a high voltage between a pair of main current conducting electrodes of one of said transistors and a second portion of said high voltage between a pair of main current conducting electrodes of the other one of said transistors, said amplifier including a feedback network that provides via a common feedback path a feedback signal to one of said transistors and a voltage that is coupled to the other one of said transistors for controlling at least one of said portions of said high voltage that are developed in each of said cascode coupled transistors.

5,463,289

FIRST GRID MUTING CIRCUIT

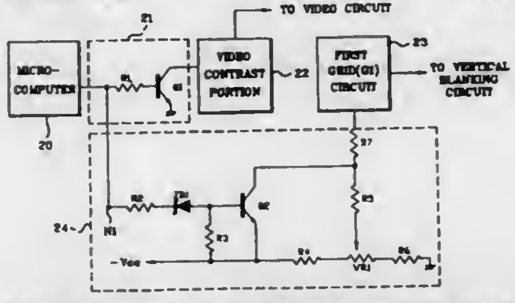
Moon J. Song, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Jan. 31; 1994, Ser. No. 189,513

Claims priority, application Rep. of Korea, Jan. 30, 1993, 93-1189; Feb. 26, 1993, 93-2978

Int. Cl.^{6} H01J *29/52*

U.S. Cl. 315—384 **4 Claims**



1. A first grid muting circuit including a muting detection circuit for receiving horizontal and vertical sync signals from a peripheral

circuit to output a muting signal during one of power-on and mode conversion state, a video muting control circuit connected to an output terminal of said muting detection circuit for outputting a control signal to control a video contrast circuit in accordance with said muting signal of said muting detection circuit, and said video contrast circuit being connected to an output terminal of said video muting control circuit for controlling the luminescence of a video signal supplied from a computer in accordance with said control signal from said video muting control portion, said first grid muting circuit comprising:

a microcomputer for supplying said muting signal;

a first grid muting control circuit connected to an output terminal of said microprocessor and responsive to said muting signal from said microcomputer for generating a control signal for controlling a first grid circuit; and

said first grid circuit connected to an output terminal of said first grid muting control circuit for controlling a first grid of a cathode ray tube in accordance with said control signal from said first grid muting control circuit to prevent the generation of back raster in said cathode ray tube.

5,463,290

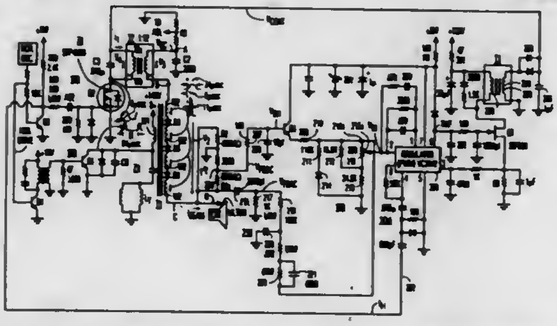
POWER SUPPLY STABILIZATION CIRCUIT WITH SEPARATE AC/DC NEGATIVE FEEDBACK PATHS

William V. Fitzgerald, Zionsville, Ind., assignor to Thomson Consumer Electronics, Inc., Indianapolis, Ind.

Filed May 2, 1994, Ser. No. 236,065

Int. Cl.^{6} H01J ***29/70;*** **H04N** ***5/63***

U.S. Cl. 315—411 **9 Claims**



1. A high voltage power supply for a video apparatus, comprising:

a flyback transformer;

a resonant circuit;

switching means coupled to said resonant circuit for generating a flyback pulse voltage at a terminal of a high voltage winding of said flyback transformer;

a rectifier coupled to said high voltage winding for rectifying said flyback pulse voltage to produce a rectified high voltage at a high voltage electrode of a cathode ray tube;

a voltage regulator having a first control input responsive to an AC feedback signal that is indicative of beam loading variations and coupled to said high voltage winding for controlling an amplitude of said flyback pulse voltage in a negative feedback manner;

a charge storage capacitance coupled to said electrode for supplying a current that flows in said electrode to reduce a rate of change of said high voltage when a beam current variation occurs; and

means coupled to said capacitance and responsive to a current that flows in said capacitor for generating said AC feedback signal in accordance with said current in said capacitance.

5,463,291

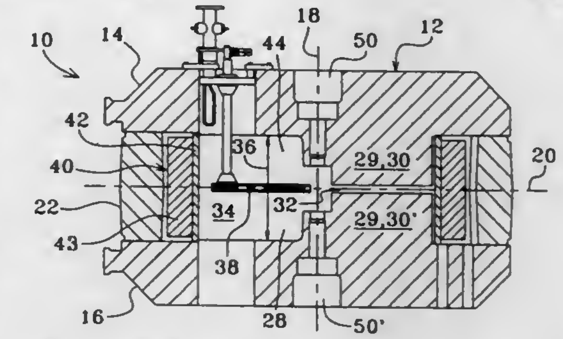
CYCLOTRON AND ASSOCIATED MAGNET COIL AND COIL FABRICATING PROCESS

Lewis Carroll, 3130 Lewiston Ave., Berkeley, Calif. 94705; George Hendry, 3104 Redwood Rd., Napa, Calif. 94558, and Franck Picker, 117 Normandy Rd., Oak Ridge, Tenn. 37830

Filed Dec. 23, 1993, Ser. No. 178,375

Int. Cl.^{6} H05H ***13/00***

U.S. Cl. 315—502 **19 Claims**



1. A cyclotron comprising:

a return yoke provided with a cavity therein;

a plurality of hill regions within said return yoke, each said hill region defining an upper hill section and a lower hill section separated by a first air gap for accommodating a particle beam, said hill regions being selectively spaced so as to provide valley regions therebetween defining further air gaps greater in width than said first air gaps; and

a substantially circular magnet coil surrounding said hill regions and said valley regions, said coil defining a coil body including coil windings, and having at least one beam exit hole extending through said coil body for accommodating the exiting of a particle beam from said cyclotron.

5,463,292

IMAGING APPARATUS HAVING ROTARY TABLE

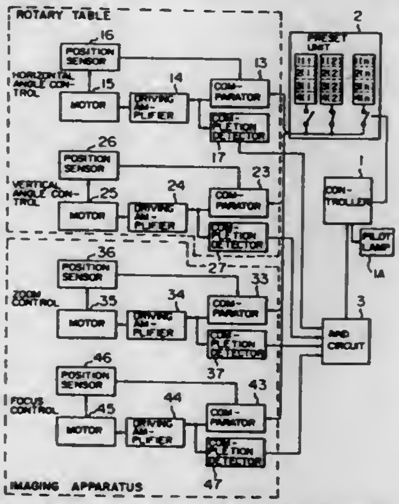
Jyoji Wada, Yokohama, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 23, 1994, Ser. No. 216,347

Claims priority, application Japan, Mar. 25, 1993, 5-066314

Int. Cl.^{6} H02P ***1/54***

U.S. Cl. 318—34 **18 Claims**



1. An imaging apparatus with at least one movable component and a control device, said control device comprising:

control means for storing a plurality of sets of desired position data preset for control of a plurality of control items which represent a positional state of said at least one movable component, for selecting one set out of said plurality of sets of desired position data and for outputting said desired position data in said one set for at least two of said plurality of control items;

power source means, provided for respective ones of said plurality of control items, for receiving said desired position data output by said control means and for causing movement of said at least one movable component toward desired positions indicated by said desired position data output by said control means;

position sensor means, provided for said respective ones of said plurality of control items, for generating current position information of said at least one movable component corresponding to said plurality of control items;

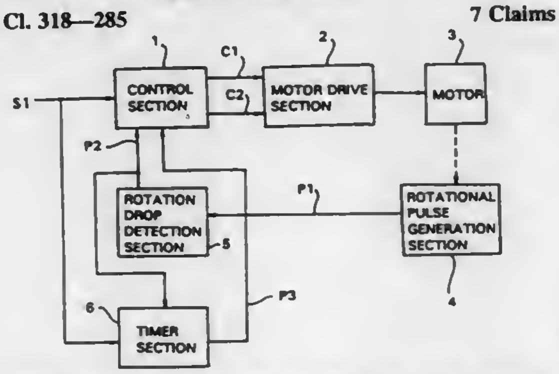
completion detection means provided for said respective ones of said plurality of control items, for detecting completion of said movement to produce completion outputs; and

an AND circuit for performing an AND function on said completion outputs, an operation completion signal being outputted from said AND circuit upon completion of said movement for all of said plurality of control items.

5,463,293
MOTOR CONTROL DEVICE

Tomoji Matsui, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Jan. 25, 1994, Ser. No. 186,422
Claims priority, application Japan, Jan. 27, 1993, 5-011317
Int. Cl.^{6} H02P *6/02*
U.S. Cl. 318—285 **7 Claims**



1. A motor control device for a motor, the motor having a rotation speed, a direction of rotation and a maximum rotation stopping required time equal to a preset maximum time required for the motor to stop upon application of a reverse torque, the control device comprising:

a rotational pulse generation section for generating a rotational pulse signal of a period conforming to the rotation speed of a motor;

a rotation drop detection section for detecting when the period of the rotational pulse signal is reduced to a predetermined preset value representative of a drop of the rotation speed and outputting a corresponding pulse;

a timer section for starting a timing operation in response to a rotation stopping signal supplied thereto from the outside and outputting a pulse when the time elapsed during the timing operation equals the maximum rotation stopping required time of said motor;

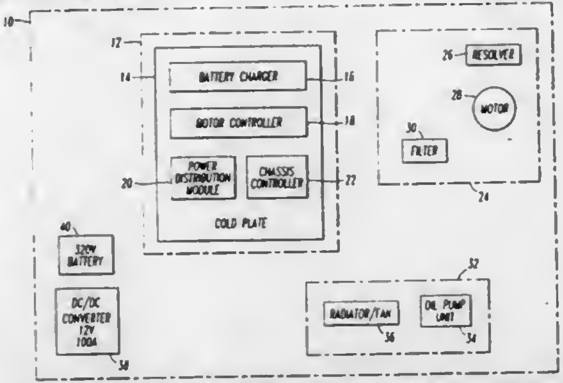
a control section for instructing, when the rotation stopping signal is received, said motor to apply reverse torque to the direction of rotation of said motor and then instructing, when the pulse representative of a drop of rotation or the pulse outputted from said timer section is received, said motor to stop the application of reverse torque; and

a motor drive section for driving said motor in response to instructions from said control section.

5,463,294
CONTROL MECHANISM FOR ELECTRIC VEHICLE

Aaron D. Valdivia, Baltimore, and Eric L. Mohler, Anne Arundel, both of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 10, 1994, Ser. No. 258,149
Int. Cl.^{6} H02P *7/00*
U.S. Cl. 318—432 **20 Claims**



1. A motor controller for a vehicle including an electric motor that drives the vehicle and a vehicle power controller, wherein the vehicle power controller generates mode commands, and wherein the motor controller has a current operating mode, the motor controller comprising:

means for receiving a mode command;

means for transitioning the current operating mode of the motor controller in accordance with the mode command;

means for receiving an operating command while the motor controller is in the current operating mode;

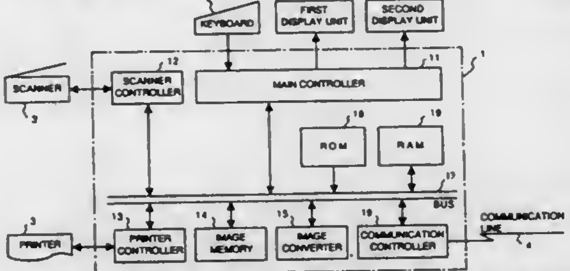
means for determining whether the operating command is an appropriate command for processing during the current operating mode; and

means for processing the operating command when the determining means determines that the operating command is an appropriate command.

5,463,295
FACSIMILE APPARATUS WITH CONTROL OF RESOLUTION TO BE COMPATIBLE WITH RECEIVING SIDE

Masaaki Inde, Higashimurayama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 894,860, Jun. 5, 1992, abandoned.
This application Sep. 26, 1994, Ser. No. 311,886
Claims priority, application Japan, Jun. 7, 1991, 3-136283
Int. Cl.^{6} H04N *1/40;* H04M *1/00*
U.S. Cl. 358—442 **12 Claims**



1. A facsimile apparatus for reading an original at a designated resolution, comprising:

means for identifying a reception-possible resolution of a reception-side facsimile apparatus;

discrimination means for discriminating whether or not the designated original reading resolution coincides with the reception-possible resolution;

conversion means for, when said discrimination means determines that the two resolutions do not coincide with each other, converting the designated original reading resolution into the reception-possible resolution of a different coarseness of image from said designated original reading resolution; and

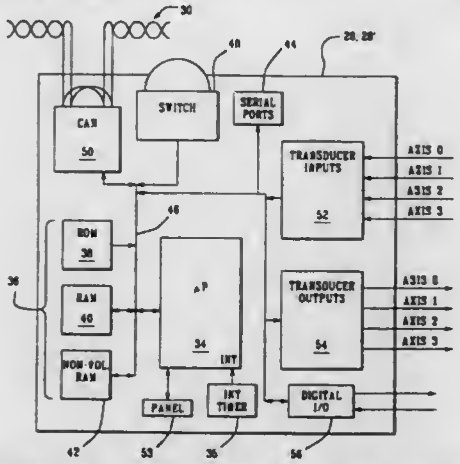
display means for displaying the converted, reception-possible resolution as a resolution of transmission data, wherein said display means displays said converted, reception-possible resolution in the discriminating form that a coarseness of image represented by the reception-possible resolution of the transmission data is different from that of said designated original reading resolution.

5,463,296

MOTION CONTROLLER WITH REMOTE LINKING

Michael A. Fugere, and David E. Halpert, both of Windsor County, Vt., assignors to Allen-Bradley Company, Inc., Milwaukee, Wis.

Filed Jun. 30, 1993, Ser. No. 85,998
Int. Cl.^{6} G05B *19/10*
U.S. Cl. 318—568.2 **3 Claims**



1. A method of controlling a servo motor unit receiving command signals from a slave motion controller in response to axis signals indicating position from a master motion controller remotely located and connected to the slave motion controller via a digital communications link, the link communicating the axis signals from the master motion controller to the slave motion controller, the method comprising the steps of:

causing the slave motion controller to read a local clock at the time of receipt of each axis signal;

estimating from the axis signal the velocity of the axis associated with the axis signals;

causing the slave motion controller to read the local clock again immediately prior to updating the command signals to the motor from the slave motion controller;

adjusting the axis signal according to the time difference indicated by the two readings of the local clock and the estimated velocity; and

updating the command signals to the motor from the slave motion controller according to the adjusted axis signal.

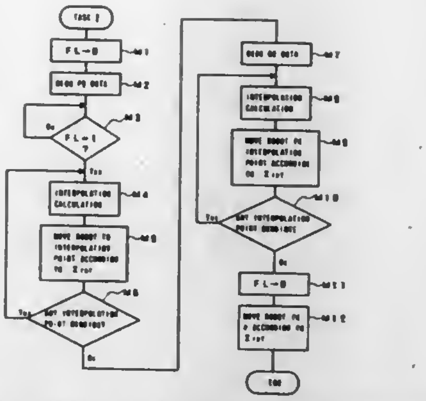
5,463,297

CIRCULAR TRACKING METHOD FOR ROBOT

Ryuichi Hara, Fujiyoshida; Atsuo Nagayama, and Hidetoshi Kumiya, both of Yamanashi, all of, Japan, assignors to Fanuc, Ltd., Minamitsuru

Filed Dec. 6, 1994, Ser. No. 354,027
Claims priority, application Japan, Dec. 10, 1993, 5-340934
Int. Cl.^{6} G05B *19/00*
U.S. Cl. 318—568.13 **2 Claims**

1. A robot tracking method for moving a robot along a trajectory predetermined on a circularly moving workpiece, comprising the steps of:



(a) teaching the robot of position of said predetermined trajectory in a stationary coordinate system when the workpiece remains stationary at a reference position;

(b) detecting an amount of revolution of the workpiece from said reference position while the workpiece is circularly moving;

(c) setting a rotary coordinate system which is obtained by revolving said stationary coordinate system by said amount of revolution detected in said step (b);

(d) successively calculating a robot position in said stationary coordinate system based on a robot position in said rotary coordinate system; and

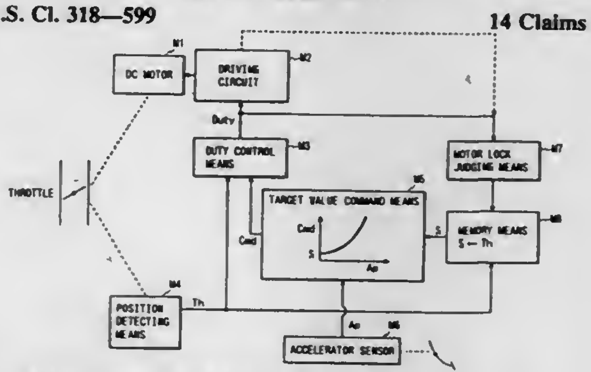
(e) moving the robot along said predetermined trajectory based on the robot positions calculated in said step (d).

5,463,298

APPARATUS FOR DETECTING REFERENCE POSITION OF SERVO-CONTROLLED MEMBER

Shigeru Kamio, Nagoya; Mitsuo Hara, Aichi, and Hitoshi Tasaka, Chiryu, all of, Japan, assignors to Nippondenso Co., Ltd., Aichi, Japan

Filed Jun. 1, 1993, Ser. No. 69,708
Claims priority, application Japan, Jun. 1, 1992, 4-140743
Int. Cl.^{6} B60K *26/04*
U.S. Cl. 318—599 **14 Claims**



1. A servo control apparatus comprising:

a DC motor;

position detecting means for producing a detection signal representing a rotational position of said DC motor;

target command means for producing a command signal representing a target rotational position of said DC motor;

duty control means for determining, based upon a deviation between said detection signal produced by said position detecting means and said command signal produced by said target command means, a duty-ratio signal to be supplied to said DC motor, so as to supply said DC motor with an exciting current that is adjusted in accordance with said duty-ratio signal;

motor lock judging means for receiving said duty-ratio signal produced by said duty control means and for determining, based upon said duty-ratio signal, whether or not said DC motor is in a locked condition; and reference position memory means for memorizing a reference position corresponding to said detection signal produced by said position detecting means when said motor lock judging means determines that said DC motor is in said locked condition.

5,463,299

CURRENT CONTROLLER FOR CONTROLLING A CURRENT FLOWING IN A LOAD USING A PWM INVERTER AND METHOD USED THEREBY

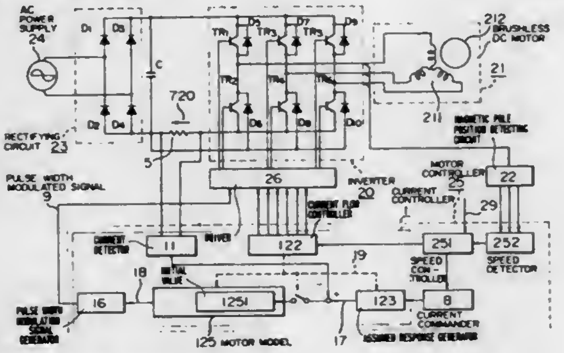
Motoo Futami, Hitachi; Tunehiro Endo, Hitachiota; Yasuo Notohara, Hitachi, and Tooru Kitayama, Tochigi, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 533,752, Jun. 27, 1990, abandoned. This application Sep. 13, 1993, Ser. No. 119,482

Claims priority, application Japan, Jun. 7, 1989, 1-142958

Int. Cl.^{6} H02P *6/00*

U.S. Cl. 318—618 **25 Claims**



1. A current controller including:

modulating means for which employs a pulse width modulation signal having a first period with which a current change is periodically repeated and in which a plurality of pulses with a second period are included, for modulating a current within said first period by said pulse width modulation signal;

detection means for detecting a current in a load at least once within said second period;

means for producing said pulse width modulation signal in accordance with a current flow rate in order to make said detected current agree with a command value;

assumed response generating means for generating an assumed response as a current response within said first period in accordance with a command current;

load model means for finding said current flow rate in accordance with an initial value stored in a readable and writable memory element in order to flow a current corresponding to said assumed response; and

means for modifying the initial value of said load model means in accordance with the difference between said detected current and said assumed response output, and generating the necessary current flow rate at said second period as time elapses after the start of said first period.

5,463,300

AC MOTOR CONTROLLER WITH 180 DEGREE CONDUCTIVE SWITCHES

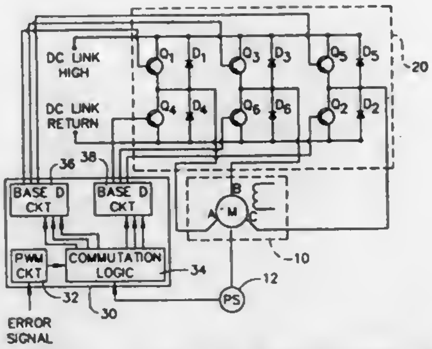
Carol A. Oximberg, 415 N. Bronson Ave., Los Angeles, Calif. 90004

Filed Aug. 26, 1993, Ser. No. 112,160

Int. Cl.^{6} H02P *5/34*

U.S. Cl. 318—801 **6 Claims**

1. An apparatus for controlling an ac motor having a rotor, stator windings, and sensors for generating position signals that indicate the position of the rotor with respect to the stator windings, said apparatus comprising:



commutation means, responsive to said position signals, for generating commutation commands

an inverter means for energizing selected stator windings, said inverter means having three switches being gated by the commutation commands whereby at least two of the switches are continuously on for three consecutive 60 degree intervals and the other switch is modulated.

5,463,301

VECTOR CONTROLLING METHOD AND APPARATUS FOR INDUCTION MOTOR

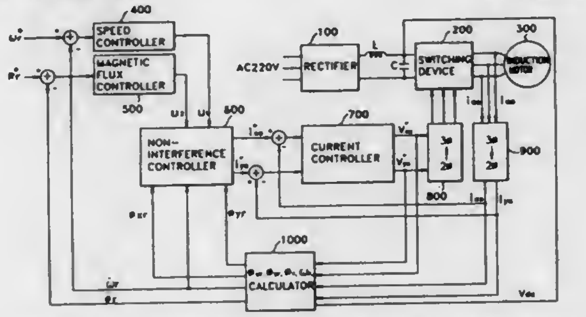
Jung G. Kim, Seoul, Rep. of Korea, assignor to Samsung Aerospace Industries, Ltd., Kyongangnam, Rep. of Korea

Filed Oct. 31, 1994, Ser. No. 332,269

Claims priority, application Rep. of Korea, Nov. 12, 1993, 1993-24055

Int. Cl.^{6} H02P *5/40*

U.S. Cl. 318—801 **8 Claims**



3. A vector controlling method for an induction motor having a rotator and stator, comprising the steps of:

(a) measuring currents and voltages i_{xs}, i_{ys}, V_{xs} and V_{ys} for said stator and calculating stator variables α_x and α_y;

(b) calculating position angles $\cos\theta_r$ and $\sin\theta_r$ of the magnetic flux of said rotator and the magnitude ϕ_r of the magnetic flux of said rotator, thereby estimating rotator magnetic fluxes ϕ_{xr} and ϕ_{yr} with respect to x-y coordinates;

(c) calculating equations of the rotator magnetic fluxes ϕ_{xr} and ϕ_{yr} and stator currents i_{xs} and i_{ys} taking fixed coordinates as a reference axis, thereby calculating a rotator angular velocity $P\omega_r$;

(d) controlling an estimated speed value $\omega\dot{}_r$ and estimated magnetic flux value $\phi\dot{}_r$ in accordance with the calculation results of said rotator magnetic fluxes ϕ_{xr} and ϕ_{yr} and rotator angular velocity $P\omega_r$ by using a speed command ω_r^* and magnetic flux command ϕ_r^*, thereby calculating a speed control value u_1 for said rotator and a magnetic flux control value u_2 for said rotator; and

(e) operating said rotator magnetic fluxes ϕ_{xr} and ϕ_{yr} with respect to said speed control value u_1 and magnetic flux control value u_2 for said rotator, thereby obtaining stator current command values i_{xs}* and i_{ys}*.

5,463,302

SLIP COMPENSATION METHOD IN A SQUIRREL CAGE INDUCTION MOTOR

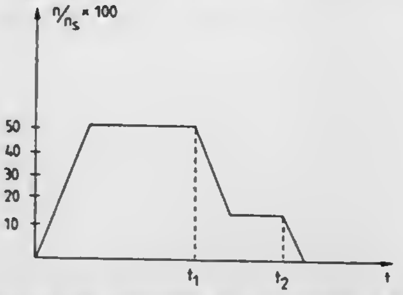
Törmä, Helsinki, Finland, assignor to ABB Industry Oy, Helsinki, Finland

Filed Sep. 9, 1994, Ser. No. 303,756

Claims priority, application Finland, Sep. 24, 1993, 934200

Int. Cl.^{6} H02P *5/28*

U.S. Cl. 318—807 **5 Claims**



1. Method for slip compensation in a squirrel cage induction motor, comprising the steps of:

feeding the motor from an inverter without feedback at a supply frequency less than 20% of the rated supply frequency of the motor after the motor has first been fed at a frequency more than 50% of the rated frequency for a period of time t_1 at least equal to a mechanical time constant of a combination formed by the motor and a load device;

determining a compensation term kT proportional to the torgue T of the motor;

adding to a set value of the motor rotation speed to effect slip compensation of the motor, a value of said compensation term kT being stored in a memory before transition from a frequency more than 50% of the rated motor frequency to a frequency less than 50% of the rated motor frequency; and

applying the stored compensation term for slip compensation when the supply frequency of the motor is less than 20% of the rated frequency of the motor for a period from time t_1 to a time t_2.

5,463,303

MULTILAYER SEPARATE WINDINGS OF INDUCTIVE CHARGE COUPLER FOR AUTOMOBILE BATTERY CHARGING TRANSFORMER

John T. Hall, Woodland Hills, and Herbert J. Tanzer, Topanga, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Nov. 2, 1993, Ser. No. 146,763

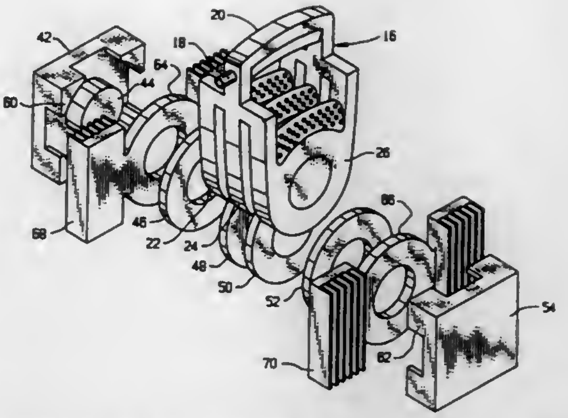
Int. Cl.^{6} H02J *7/00;* **H01F** *27/08;27/30*

U.S. Cl. 320—2 **14 Claims**

1. An automobile charging transformer comprising:

a transformer primary inductive charge coupler for attachment to a fixed alternating current power supply, said coupler having a plurality of spaced primary electric coils;

a transformer secondary inductive charge receptacle with secondary coils for mounting in the automobile to charge the battery of the automobile, said transformer secondary inductive charge receptacle having a plurality of slots therein, each corresponding to one of said primary electric coils; and



a magnetic core associated with said primary electric coils and said secondary electric coils to complete the magnetic circuit through said primary and secondary coils, said transformer primary inductive charge coupler being separable from said transformer secondary inductive charge receptacle so that the automobile can depart from the fixed power supply.

5,463,304

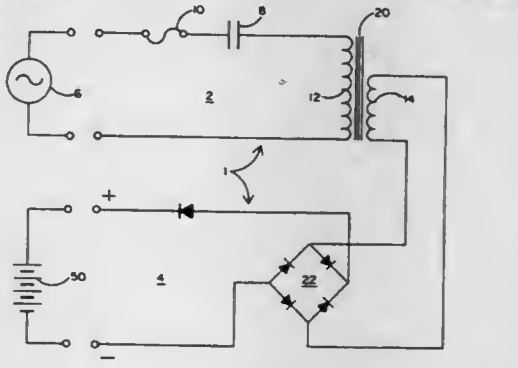
LIFE EXTENDING CIRCUIT FOR STORAGE BATTERIES

Thomas L. Winters, 1921 Bay Crest, Santa Ana, Calif. 92704

Filed Nov. 22, 1993, Ser. No. 157,662

Int. Cl.^{6} H02J *7/02;* **H01M** *10/44;10/46*

U.S. Cl. 320—4 **14 Claims**



1. A resonant circuit to prolong the life of a storage battery during periods of non-use, where said storage battery contains a liquid electrolyte, said resonant circuit having input terminal means to be connected to a 110 volt AC source and output terminal means to be connected to the power terminals of the storage battery to provide an output voltage thereto, said resonant circuit comprising a step down transformer having primary and secondary windings, a capacitor connected between said input terminal means and the primary winding of said step down transformer and an electrical rectifier connected between the secondary winding of said transformer and said output terminal means for providing a pulsed DC output voltage to said power terminals.

5,463,305

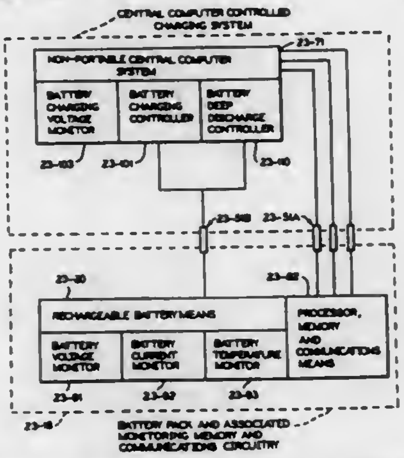
FAST BATTERY CHARGING SYSTEM AND METHOD

Steven E. Koenck, Cedar Rapids, Iowa, assignor to Norand Corporation, Cedar Rapids, Iowa

Continuation-in-part of Ser. No. 769,337, Oct. 1, 1991, Pat. No. 5,278,487, Ser. No. 478,180, Feb. 9, 1990, abandoned, and Ser. No. 446,231, Dec. 5, 1989, abandoned, said Ser. No. 769,337is a continuation-in-part of Ser. No. 544,230, Jun. 26, 1990, abandoned, Ser. No. 478,180, Jun. 26, 0, and Ser. No. 446,231, Jun. 26, 0, said Ser. No. 544,230is a continuation-in-part of Ser. No. 478,180, Jun. 26, 0, Ser. No. 446,231, Jun. 26, 0, Ser. No. 422,226, Oct. 16, 1989, Pat. No. 4,961,043, and Ser. No. 226,537, Nov. 2, 1988, abandoned, said Ser. No. 478,180is a continuation-in-part of Ser. No. 446,231, Nov. 2, 0, Ser. No. 422,226, Nov. 2, 0, and Ser. No. 266,537, Nov. 2, 0, said Ser. No. 446,231is a continuation-in-part of Ser. No. 422,226, Nov. 2, 0, Ser. No. 266,537, Nov. 2, 0, and Ser. No. 168,352, Mar. 15, 1988, Pat. No. 4,885,523, said Ser. No. 422,226is a continuation-in-part of Ser. No. 266,537, Mar. 15, 0, and Ser. No. 168,352, Mar. 15, 0, said Ser. No. 266,537is a division of Ser. No. 168,352, Mar. 15, 0, whicb is a continuation-in-part of Ser. No. 944,503, Dec. 18, 1986, Pat. No. 4,737,702, which is a continuation-in-part of Ser. No. 876,194, Jun. 19, 1986, Pat. No. 4,709,202, and Ser. No. 797,235, Nov. 12, 1985, Pat. No. 4,716,354, said Ser. No. 876,194is a division of Ser. No. 797,235, Nov. 12, 0, which is a continuation-in-part of Ser. No. 612,588, May 21, 1984, Pat. No. 4,553,081, which is a continuation-in-part of Ser. No. 385,830, Jun. 7, 1982, Pat. No. 4,455,523. This application Feb. 18, 1992, Ser. No. 837,650

Int. Cl.^{6} H02J *7/10*

U.S. Cl. 320—21 **56 Claims**


CENTRAL COMPUTER CONTROLLED CHARGING SYSTEM
23-71
NON-PORTABLE CENTRAL COMPUTER SYSTEM
BATTERY CHARGING VOLTAGE MONITOR
BATTERY CHARGING CONTROLLER
BATTERY DEEP DISCHARGE CONTROLLER
23-103
23-101
23-110
23-58B
23-51A
23-80
23-82
RECHARGEABLE BATTERY MEANS
PROCESSOR, MEMORY AND COMMUNICATIONS MEANS
BATTERY VOLTAGE MONITOR
BATTERY CURRENT MONITOR
BATTERY TEMPERATURE MONITOR
23-91
23-92
23-93
23-18
BATTERY PACK AND ASSOCIATED MONITORING MEMORY AND COMMUNICATIONS CIRCUITRY

1. A means for charging a battery contained within a housing of a device, where the battery is connected to a varying load and charging current for a given time is provided by charging current means, said battery charging means comprising:

- connection means for communicating the charging current from the charging current means to the battery;
- switching means positioned in the connection means for converting the charging current from the charging current means into a pulsed current consisting of successive pulses having a duty cycle and a net value of charging current for a given time;
- monitoring means associated with the battery for sensing the net value of the charging current for a given time at the battery;
- control means for receiving the net value of charging current at the battery for a given time, comparing it to a target net value for and adjusting operation of the switching means to vary the duty cycle of the pulsed current to maintain the target net value at the battery regardless of the varying load; and
- said charging current means comprising a current regulation means to produce the charging current.

5,463,306

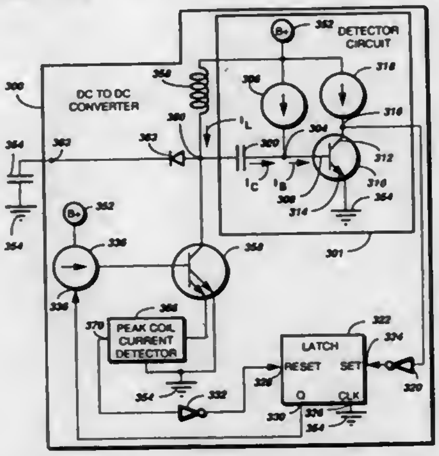
APPARATUS FOR DETECTING COMPLETION OF ENERGY TRANSFER IN AN INDUCTIVE DC TO DC CONVERTER

James E. Berry, Austin, Tex.; Gary L. Pace, Boca Raton, Fla.; Barry W. Herold, Boca Raton, Fla.; Kevin McLaughlin, Lake Worth, Fla., and Margaret Graham-Meighan, Boynton Beach, Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 19, 1993, Ser. No. 93,488

Int. Cl.^{6} G05F *1/575*

U.S. Cl. 323—222 **18 Claims**



1. A detector circuit for use in a DC to DC converter having an inductor coupled to switch means for interrupting an electric current through the inductor, thereby allowing the inductor to transfer stored energy to a capacitive load, said detector circuit comprising:

- voltage differentiation means coupled to the inductor for generating a transient current in response to a completion of a transfer of stored energy from the inductor;
- reference current generator means for generating a reference current;
- summing means coupled to said voltage differentiation means and coupled to said reference current generator means for summing the transient current and the reference current, thereby generating a transient control current responsive to the completion of the transfer of stored energy from the inductor; and
- logic conversion means coupled to said summing means for converting the transient control current into a transfer-complete signal.

5,463,307

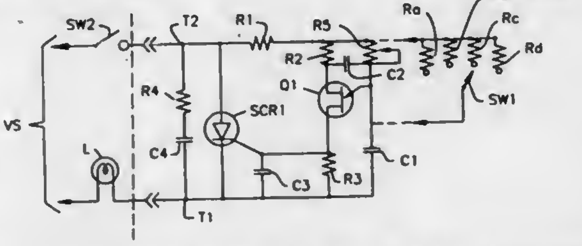
HIGH EFFICIENCY, LOW VOLTAGE ADAPTER APPARATUS AND METHOD

Steven Rosenberg, 1307 Maple Ave., South Plainfield, N.J. 07080

Continuation of Ser. No. 986,514, Dec. 7, 1992, abandoned. This application Oct. 5, 1994, Ser. No. 318,529

Int. Cl.^{6} G05F *5/02*

U.S. Cl. 323—300 **35 Claims**



1. A power control circuit for a load having a predetermined voltage rating, comprising:

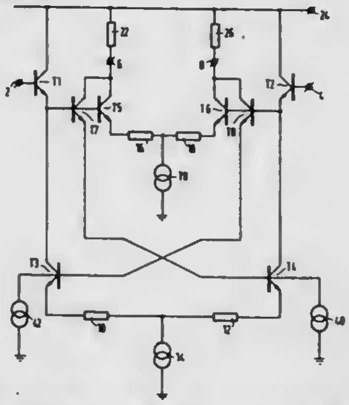
- a first terminal adapted to connect to said load;

- a second terminal adapted to be connected through a power switch to an alternating voltage source having a magnitude rated substantially in excess of said predetermined voltage rating:
- a switching means serially connected between said first and second terminal;
- capacitive filter means having dual terminals separately connected to said first and second terminals for shunting from said switching means transient currents flowing through said load;
- timing means coupled to said switching means for periodically operating said switching means at a frequency proportional to that of said alternating voltage source for less than one quarter of a full cycle of said alternating voltage source and only during positive half cycles of said alternating voltage source, said switching means being timed by said timing means to keep the magnitude of average voltage to said load substantially less than that of said alternating voltage source.

5,463,308
VOLTAGE-CURRENT CONVERTER

Pieter Vorenkamp, and Johannes P. M. Verdaasdonk, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 29, 1994, Ser. No. 283,236
Claims priority, application Belgium, Jul. 30, 1993, 9300814
Int. Cl.⁶ G05F *3/26*
U.S. Cl. 323—312 **1 Claim**



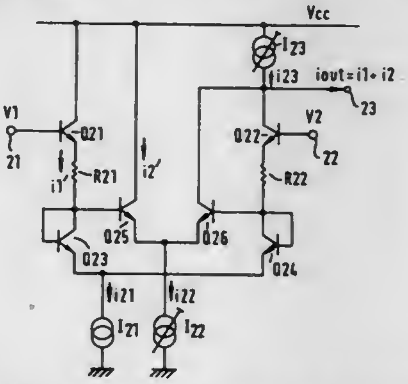
1. A voltage-current converter for converting an input voltage into an output current, comprising:

- a first (2) and a second (4) input terminal for receiving the input voltage; a first (6) and a second (8) output terminal for supplying the output current; a first (T1), a second (T2), a third (T3) and a fourth (T4) transistor, each having a control electrode, a first main electrode and a second main electrode, the control electrode of the first transistor (T1) being coupled to the first input terminal (2), the control electrode of the second transistor (T2) being coupled to the second input terminal (4), the first main electrode of the first transistor (T1) being coupled to the second main electrode of the third transistor (T3), the first main electrode of the second transistor (T2) being coupled to the second main electrode of the fourth transistor (T4), the control electrode of the third transistor (T3) being coupled to the first main electrode of the second transistor (T2), and the control electrode of the fourth transistor (T4) being coupled to the first main electrode of the first transistor (T1);
- a first resistor (10, 12) connected between the first main electrode of the third transistor (T3) and the first main electrode of the fourth transistor (T4); and at least one first current scurce (14) coupled to the first main electrodes of the third transistor (T3) and the fourth transistor (T4),
- a fifth (T5) and a sixth (T6) transistor, each having a control electrode, a first main electrode and a second main electrode, the control electrode of the fifth transistor (TS) being coupled to the first main electrode of the first transistor (T1), the control electrode of the sixth transistor (TG) being coupled to the first main electrode of the second transistor (T2), the second main electrode of the fifth transistor (T5) being coupled to the first output terminal (6), and the second main electrode of the sixth transistor (T6) being coupled to the second output terminal (8);
- a second resistor (16, 18) connected between the first main electrode of the fifth transistor (T5) and the first main electrode of the sixth transistor (T6); and at least one second current source (20) coupled between the first main electrodes of the fifth transistor (T5) and the sixth transistor (T6), characterised in that the voltage-current converter further comprises: a seventh (T7) and an eighth (T8) transistor, each having a control electrode, a first main electrode and a second main electrode, the control electrode of the seventh transistor (T7) being coupled to the first main electrode of the first transistor (T1), the control electrode of the eighth transistor (T8) being coupled to the the first main electrode of the second transistor (T2), the first main electrode of the seventh transistor (T7) being coupled to the control electrode of the fourth transistor (T4), and the first main electrode of the eighth transistor (T8) being coupled to the control electrode of the third transistor (T3), and in that the seventh transistor (T7) has its second main electrode coupled to the first output terminal (6) and the eighth transistor (T8) has its second main electrode coupled to the second output terminal (8).

5,463,309
VARIABLE VOLTAGE TO CURRENT CONVERSION CIRCUIT

Mitsumo Kawano, Saitama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 21, 1993, Ser. No. 124,008
Claims priority, application Japan, Sep. 21, 1992, 4-251392
Int. Cl.⁶ G05F *3/16*
U.S. Cl. 323—315 **5 Claims**



1. A variable voltage to current conversion circuit comprising:

- a voltage to current converter;
- a gain controllable current converter coupled to the voltage to current converter; and
- an adder for summing currents generated by the voltage to current converter and the gain controllable current converter and for generating an output current based on the summed currents.

5,463,310

INSTRUMENT FOR MEASURING THE FREQUENCY AND POWER OF A MICROWAVE SIGNAL

Timothy J. Pegg, Gamlingay; George Hjipieris, Hitchin, and Andrew G. Bullock, Hemel Hempstead, all of, England, assignors to Marconi Instruments Limited, United Kingdom

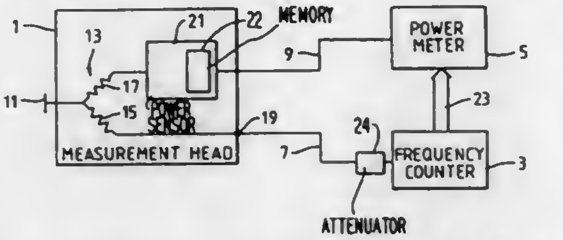
Continuation of Ser. No. 966,728, Oct. 26, 1992, abandoned.

This application Nov. 2, 1994, Ser. No. 333,359

Claims priority, application United Kingdom, Nov. 25, 1991, 9124973

Int. Cl.^{6} G01R *23/02*

U.S. Cl. 324—95 **12 Claims**



1. An instrument which provides a measurement of the frequency and power of a microwave signal supplied to an input port of said instrument, comprising: resistive means for dividing said microwave signal into first and second microwave divisions thereof; frequency measuring means for measuring the frequency of said first microwave division, thereby providing said measurement of the frequency of said microwave signal supplied to said input port; and power measuring means for measuring the power of said second microwave division, said power measuring means including a memory for storing a calibration correction factor for a plurality of frequencies, said power measuring means making an initial incorrect measurement of the power and then making a frequency dependent calibration correction to this initial measurement by applying to the initial measurement the calibration correction factor previously determined for the particular frequency measured by said frequency measuring means, said application of the calibration correction factor providing said measurement of the power of said microwave signal supplied to said input port; and, in said instrument, said power measuring means being isolated from said frequency measuring means to inhibit reflections of said first microwave division by said frequency measuring means reaching said power measuring means.

5,463,311

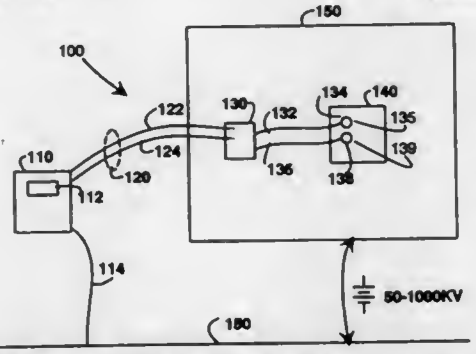
APPARATUS AND METHOD FOR MEASURING OPERATING VOLTAGE ELECTRICAL SIGNALS IN A HIGH VOLTAGE ENVIRONMENT

Steve Toy, Auburn, Calif., assignor to NEC Electronics, Inc., Mountain View, Calif.

Filed Dec. 21, 1993, Ser. No. 171,781

Int. Cl.^{6} G01R *31/02*

U.S. Cl. 324—96 **6 Claims**



1. An apparatus for measuring electrical signals from an electrical circuit in a high voltage environment, the electrical circuit functioning generally in a reduced operating voltage range referenced to a high reference voltage of the high voltage environment, the apparatus comprising:

- a measurement module configured to be portably positioned in the high voltage environment and referenced to the high reference voltage, the module including:
  - a measurement detector having test input terminals for attachable and detachable connection to various test points of the electrical circuit and an output terminal for furnishing a measured parameter; and
  - a fiber-optic transmitter having an input terminal coupled to the output terminal of the measurement detector for receiving the measured parameter and an output terminal for transmitting the measured parameter;
- an electrically-nonconductive fiber optic cable coupled to the output terminal of the transmitter; and
- a display module positioned external to the high voltage environment and coupled to the fiber optic cable including a receiver for receiving the measured parameter and a display for exhibiting a representation of the measured parameter;
- wherein the high voltage environment has a voltage range including voltages from approximately 1 KV to approximately 10,000 KV.

5,463,312

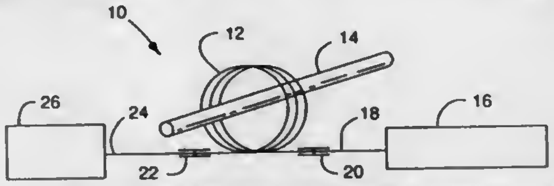
FARADAY-EFFECT SENSING COIL WITH STABLE BIREFRINGENCE

Dale R. Lutz, Maplewood, Minn.; Trevor W. MacDougall, Cedar Park; William L. Taylor, Round Rock, both of Tex.; Wayne F. Varner, Woodbury, Minn., and Robert A. Wandmacher, Cedar Park, Tex., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 3, 1994, Ser. No. 205,899

Int. Cl.^{6} G01R *1/04*

U.S. Cl. 324—96 **13 Claims**



1. An article for Faraday-effect sensing of changing magnetic fields, comprising an optical fiber having a core of generally radially symmetrical cross-section, the fiber being formed into a coil having linear birefringence and circular birefringence, said linear birefringence being less than about 15°/m and said circular birefringence being less than about 4°/m.

5,463,313

REDUCED MAGNETIC FIELD LINE INTEGRAL CURRENT SENSOR

Ertugrul Berkcan, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

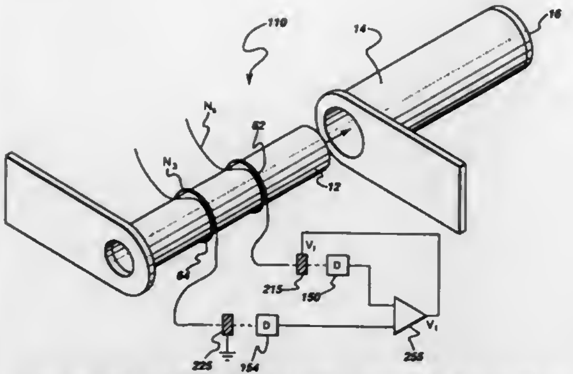
Filed Sep. 9, 1993, Ser. No. 119,269

Int. Cl.^{6} G01R *33/02;19/00*

U.S. Cl. 324—117 R **26 Claims**

1. A current sensor for measuring a primary electrical current inducing a primary magnetic field having a magnetic flux density at least defined over a known region comprising:

- a first sensor unit for measuring the line integral of the primary magnetic field along a first predetermined path within the known region; and
- a second sensor unit for measuring the line integral of the primary magnetic field along a second predetermined path within the known region, the line integral of the primary magnetic field along the second path measured by said second sensor unit being a predetermined calibrated amount different



from the line integral of the primary magnetic field along the first path measured by said first sensor unit.

5,463,314

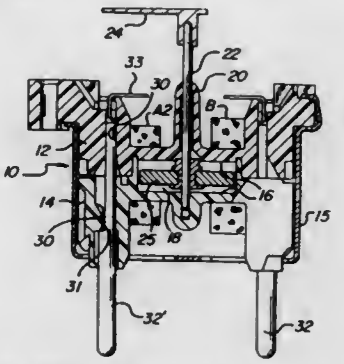
GAUGE WITH MAGNETICALLY FIXED REST POSITION

Thomas R. Mueller, Swartz Creek, and Gail M. Sylvester, Frankenmuth, both of Mich., assignors to Delco Electronics Corporation, Kokomo, Ind.

Filed Jan. 27, 1994, Ser. No. 187,024

Int. Cl.^{6} G01R *35/00;1/38;* **G01D** *11/08*

U.S. Cl. 324—146 **6 Claims**



1. An air core gauge for moving a pointer to an indicating position dependent on electrical input, the pointer having a rest position in the absence of electrical input, comprising:

a permanent magnet in the form of an armature attached to the pointer and mounted for rotation about an axis;

a gauge circuit having a plurality of coils for establishing a magnetic field around the armature, whereby the magnetic field determines pointer position when the circuit is energized and the rotation of the pointer is restricted to less than 90 degrees from the rest position; and

a plurality of terminals coupled to the gauge circuit for carrying an electrical input to energize the circuit, one of the terminals comprising ferrous material and positioned to attract the magnet and always move the pointer to the rest position in the absence of the electrical input.

5,463,315

SPIKE SUPPRESSION FOR A TESTER CIRCUIT FOR INTEGRATED CIRCUITS

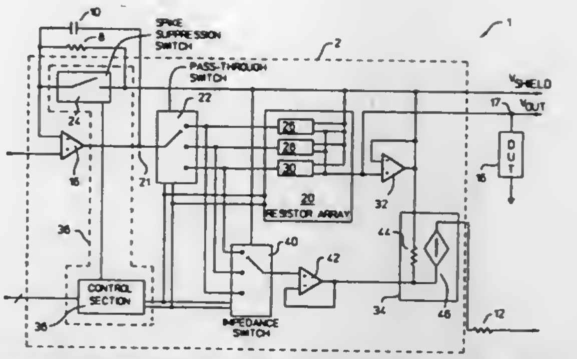
James W. Grace, Los Altos Hills, and David M. DiPietro, San Jose, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jun. 15, 1993, Ser. No. 77,190

Int. Cl.^{6} G01R *31/28;15/08*

U.S. Cl. 324—158.1 **4 Claims**

1. An integrated circuit for measurement of current by applying a test voltage to a pin of a device under test resulting in an unknown current, the circuit receiving two control signals, each control signal having two states, the integrated circuit comprising:



a driver, having a negative input, a positive input, and a driver output, the positive input connecting to the applied test voltage;

two current measurement ranges, each current measurement range having a switch and a resistor connected in series, each current measurement range having an associated scaling factor, wherein the resistor of each current measurement range is connected to the pin of the device under test and each switch of each current measurement range is connected to the driver output;

wherein one of the two current measurement ranges is the present current measurement range and the other of the two current measurement ranges is the next current measurement range wherein the switch of the present current measurement range begins to open as the switch of the next current measurement range begins to close;

a controller, connecting to the switch of the present current measurement range and the switch of the next current measurement range, receiving the two control signals, for shielding the device under test from voltage spikes which occur when switching between the two current measurement ranges, producing a suppression signal such that when both control signals are in the first state, the suppression signal enters an enabled state and when both control signals are not in the first state, the suppression signal enters a disabled state;

a protection switch, connecting to the negative input and the pin of the device under test, connecting to the controller, wherein the protection switch is closed when the suppression signal has the enabled state, wherein the protection switch is open when the suppression signal has disabled state.

5,463,316

MAGNETOOPTIC SENSOR HEAD

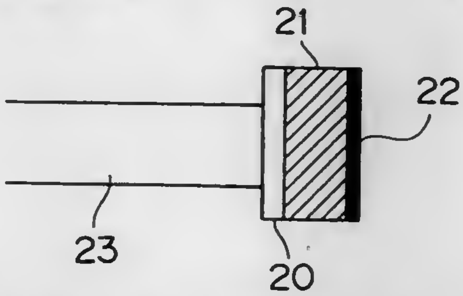
Kazushi Shirai; Toshihiro Shinbo; Norio Takeda, and Mitsuzo Arii, all of Tokyo, Japan, assignors to Mitsubishi Gas Chemical Co., Ltd., Tokyo, Japan

Filed Jun. 2, 1993, Ser. No. 70,684

Claims priority, application Japan, Jun. 3, 1992, 4-142929

Int. Cl.^{6} G01R *33/02*

U.S. Cl. 324—244.1 **4 Claims**



1. A reflection type magnetooptic sensor head where a light inputting/outputting path, polarizer, Faraday rotator, reflecting mirror are aligned in this order, comprising:

a reflecting mirror positioned substantially normal to a light incident thereupon; and a Faraday rotator made of a bismuth-substituted iron garnet single crystal film having (111) axis at an acute angle with an axis normal to a film surface thereof.

5,463,317

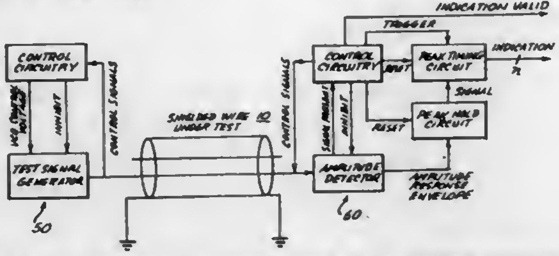
SHIELD INTEGRITY MONITOR

Timothy A. Murphy, Lynnwood, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Jun. 29, 1994, Ser. No. 268,053

Int. Cl.^{6} G01R *31/02*

U.S. Cl. 324—520 **4 Claims**



4. A shield integrity monitor system for a shielded wire cable having first and second ends comprising in combination:

a test signal generator coupled to a first end of said shielded wire cable for sweeping across the resonant frequency of the shielded wire cable;

a receiving circuit coupled to said second end of said shielded wire cable for determining a change in the resonant frequency of said shielded wire cable indicating the presence of a a degraded shield circuit of said shielded wire cable.

5,463,318

DIFFERENTIAL RESONANCE MAGNETOMETER

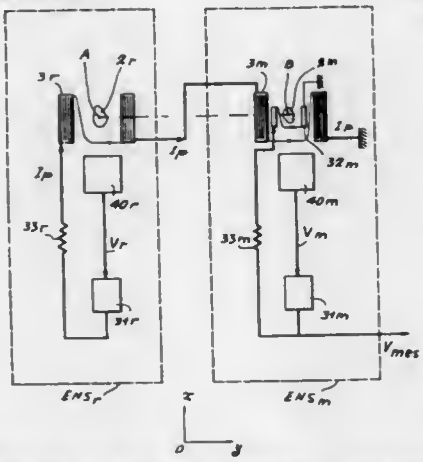
Denis Duret, Grenoble, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Feb. 25, 1994, Ser. No. 202,237

Claims priority, application France, Mar. 5, 1993, 93 02591

Int. Cl.^{6} G01V *3/00;3/08;3/14*

U.S. Cl. 324—301 **10 Claims**



1. A differential resonance magnetometer, comprising: a first assembly comprising:

a first sample with spins placed at a first point;

first means for applying to said first sample a first magnetic polarization field, said first means being traversed by a predetermined current;

first means for exciting and detecting the resonance of the spins in the first sample at a predetermined frequency and for outputting a first signal, the first signal being zero when the field applied to the first sample has a first predetermined value corresponding to the resonance and which is positive or negative when the field applied differs from the first predetermined value; and

a first feedback means generating a first feedback field reestablishing the first predetermined value of the field corresponding to the resonance; a second assembly comprising:

a second sample with spins placed at a second point spaced from the first point;

second means for applying to said second sample a second magnetic polarization field, said second means being identical to the first means, and being traversed by the predetermined current;

second means for exciting and detecting the resonance of the spins in the second sample at the predetermined frequency and for outputting a second signal, the second signal being zero when the field applied to the second sample has a second predetermined value corresponding to the resonance of the spins of the second sample and being positive or negative when the field applied differs from the second predetermined value;

second feedback means generating a second feedback field reestablishing the second predetermined value of the field corresponding to the resonance in the second sample;

an output connected to the second feedback means, said output supplying an output signal proportional to a difference of the fields present at the first and second points.

5,463,319

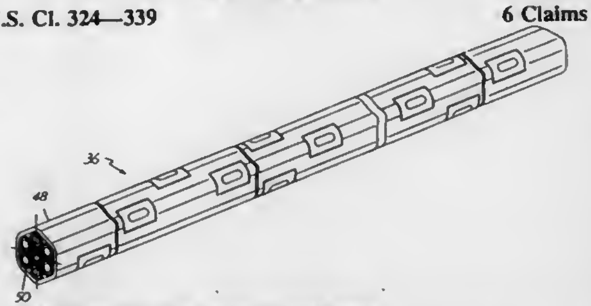
INDUCTION LOG SONDE FEEDPIPE HAVING A PLURALITY OF TUBES ARRANGED WITHIN IT AND WINDOWS TO FACILITATE THE PASSAGE OF THE CONDUCTORS

Dennis P. Chesnutt, and Randal T. Beste, both of Houston, Tex., assignors to Halliburton Energy Services, Inc., Houston, Tex.

Filed Jul. 28, 1993, Ser. No. 98,144

Int. Cl.^{6} G01V *3/18*

U.S. Cl. 324—339 **6 Claims**



1. An induction log system, comprising:

an elongated sonde assembly including transmitter and receiver coils and transmitter and receiver circuits to enable induction measurements of formation resistivity, said sonde assembly further including a housing assembly;

an elongated feedpipe assembly located within said sonde housing assembly, said feedpipe assembly comprising:

an outer generally tubular member formed of a highly electrically conductive material;

a plurality of conductors extending through said outer tubular member, said conductors arranged in selected groups in said outer tubular member; and

a plurality of tubes formed of a second material, said second material providing substantial shielding of magnetic fields, said plurality of tubes arranged within said outer member to form a tube assembly having a generally close fit within said outer member, said conductor groups extending through said tubes, each said tube completely laterally surrounding the conductor extending therethrough to provide magnetic shielding of said conductor from all sides.

5,463,320

APPARATUS AND METHOD FOR DETERMINING THE RESITIVITY OF UNDERGROUND FORMODIONS SURROUNDING A BOREHOLE

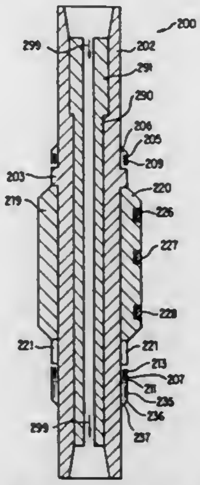
Stephen D. Bonner, Sugar Land; Richard A. Rosthal; Abdullah A. Bagersh, both of Houston, all of Tex.; Martin G. Luling, Danbury, Conn., and Jacques A. Jundt, Missouri City, Tex., assignors to Schlumberger Technology Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 955,101, Oct. 10, 1992, Pat. No. 5,339,037. This application Jun. 15, 1994, Ser. No. 259,849

The portion of the term of this patent subsequent to Aug. 16, 2011, has been disclaimed.

Int. Cl.^{6} G01V *3/20;3/18*

U.S. Cl. 324—366 **18 Claims**



1. Apparatus for use in determining the resistivity of an underground formation surrounding a borehole which comprises an elongate body that is moveable through the borehole; first and second transmitters spaced apart on the body, each serving, in use, to establish a current in the body and in the underground formation; a plurality of electrodes spaced apart on the body between the transmitters; means, located at each electrode, for measuring radial current flow along a path from the body to the underground formation via a respective electrode; and means for obtaining an axial current flowing along the body at a position corresponding to each electrode and means for measuring the axial current between the transmitters.

5,463,321

SENSOR PROBE FOR MEASURING FAT AND OIL STABILITY

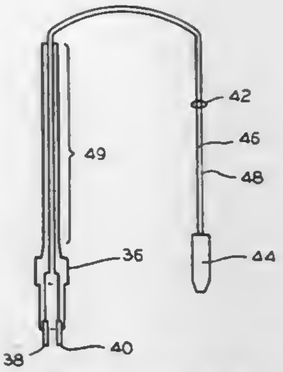
Mark G. Matlock, Mount Zion; Ronald T. Sleeter, Decatur, and Tod A. Jebe, Oreana, all of Ill., assignors to Archer Daniels Midland Company, Decatur, Ill.

Division of Ser. No. 663,576, Mar. 1, 1991, Pat. No. 5,339,254. This application Feb. 22, 1994, Ser. No. 199,617

Int. Cl.^{6} G01N *27/02*

U.S. Cl. 324—439 **16 Claims**

1. A sensor probe for measuring the stability of fats and oils, said sensor probe comprising a spaced parallel pair of electrodes for immersion in a solution possibly containing decomposition products from fats or oils; said spaced parallel electrodes being made from a metal taken from a group consisting of nickel, chromium, rhodium, titanium, and stainless steel; a quick connect connector; and a pair of wires extending from said space parallel electrodes to said quick connector; and means comprising said quick connector and said wires for applying a voltage across said pair of electrodes, an electrical current through said solution between said electrodes indicating the conductivity of said solution and the stability of said fats or oils possibly in said solution in which said probe is immersed.



5,463,322

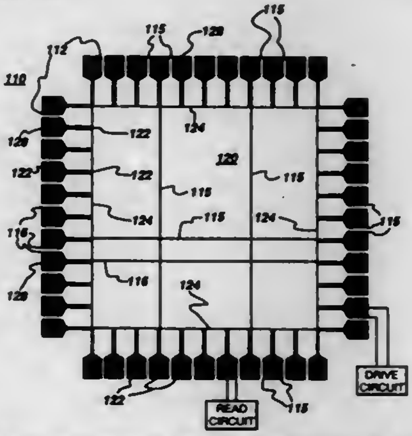
METHOD OF LOCATING COMMON ELECTRODE SHORTS IN AN IMAGER ASSEMBLY

Robert F. Kwasnick, Schenectady, and Joseph M. Pimbley, Croton-on-Hudson, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 3, 1993, Ser. No. 161,037

Int. Cl.^{6} G01R *31/08*

U.S. Cl. 324—522 **13 Claims**



1. A method of locating a short circuit between an address line and a common electrode to facilitate repair of an imager assembly having a plurality of respective x- and y- address lines and a common electrode extending across the imager assembly and having a plurality of electrical contact points disposed at selected intervals along edges of the common electrode, the method comprising the steps of:

identifying a defective address line, said defective address line being electrically shorted to said common electrode;

applying a test voltage to said defective address line, said defective address line having a short circuit to said common electrode at a point along the length L of said defective address line, the defective address line being oriented along a first axis of said imager assembly;

measuring a respective current value at each of the plurality of common electrode contact points that are disposed along two selected opposite edges of the common electrode, each of said opposite edges being disposed substantially perpendicular to said first axis of said imager assembly;

localizing a short circuit location "X" along the length L of the shorted address line, the step of localizing said short circuit location comprising processing the respective current values from said plurality of common electrode contact points in accordance with the following selected relationship:

$$I_{A-N}/I_{B-N}=(L-X)/X$$

wherein:

I_{A-N} represents the sum of measured currents from common electrode contact points along the common electrode first opposite edge;

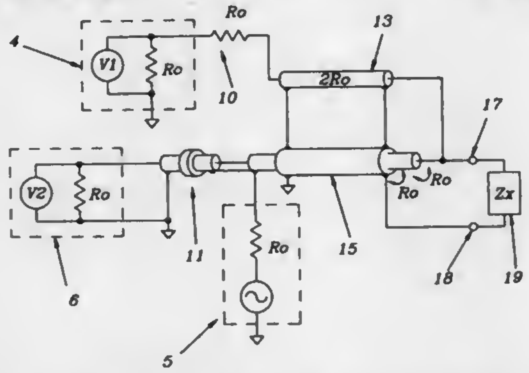
I_{a-n} represents the sum of measured currents from common electrode contact points along the common electrode second opposite edge;

L represents the length of the shorted address line; and

X represents the point of the short circuit as distance from the common electrode first opposite edge.

5,463,323
IMPEDANCE METER

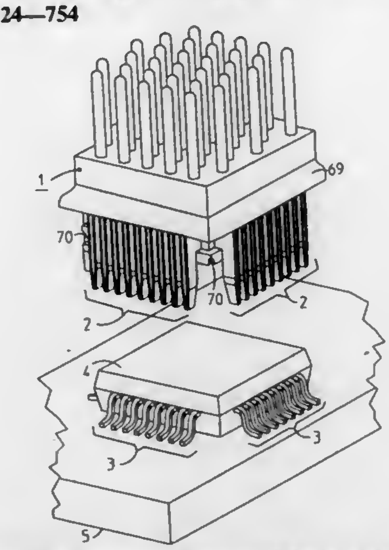
Hideki Wakamatsu, Hyogo, Japan, assignor to Hewlett-Packard Company, Palo Alto, Calif.
Filed Nov. 3, 1994, Ser. No. 333,784
Claims priority, application Japan, Dec. 28, 1993, 5-352012
Int. Cl.⁶ G01R *27/00*
U.S. Cl. 324—611 **5 Claims**



1. An impedance meter for measuring current and voltage at a device under test (DUT), comprising:
   - a triaxial cable having first and second ends, a center conductor, an intermediate conductive sheath insulated from and positioned about said center conductor and an outer conductive sheath insulated from and positioned about said intermediate conductive sheath;
   - conductive means for connecting said DUT at said second end of said triaxial cable between said center conductor and said outer conductive sheath;
   - a signal source connected between said intermediate conductive sheath and said outer conductive sheath at said first end of said triaxial cable, for introducing a test signal into said DUT;
   - current measurement means coupled between said center conductor and said intermediate conductive sheath at said first end of said triaxial cable, for measuring current flow therethrough;
   - a coaxial cable having first and second ends, an inner conductor and an outer conductive sheath, said inner conductor and outer conductive sheath at said second end connected to said center conductor and outer conductive sheath of said triaxial cable, respectively; and
   - voltage measurement means coupled between said inner conductor and outer conductive sheath at said first end of said coaxial cable for measuring voltage across said DUT upon application of a signal thereto by said signal source.

5,463,324
PROBE WITH CONTACTS THAT INTERDIGITATE WITH AND WEDGE BETWEEN ADJACENT LEGS OF AN IC OR THE LIKE

Robert H. Wardwell, Colorado Springs, Colo., and Durwood Airhart, Litchfield, Minn., assignors to Hewlett-Packard Company, Palo Alto, Calif.
Filed Oct. 26, 1993, Ser. No. 143,000
Int. Cl.⁶ G01R *1/073*
U.S. Cl. 324—754 **6 Claims**

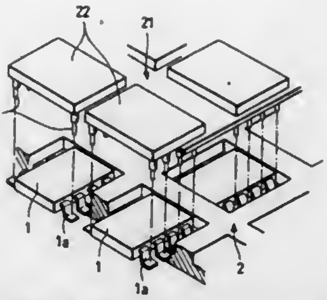


1. Apparatus for connecting test equipment to n legs along a side of an integrated circuit, the apparatus comprising:
   - a plurality of n+1 tapered fingers disposed to interdigitate with the n legs, each tapered finger having first and second conductive surfaces separated by an intervening insulating medium and adjacent tapered fingers being separated by a respective plurality of n spacers;
   - a mantle upon which the plurality of n+1 tapered legs is supported;
   - a set of n conductors, a first end of each conductor disposed proximate an associated pair of adjacent tapered fingers and a second end of each conductor disposed proximate a different and separate region of the mantle;
   - a first set of n electrical connections, each connection of the first set being between the second conductive surface of each tapered finger, the first conductive surface of an adjacent tapered finger and the first end of an associated member of the set of n conductors;
   - a set of electrical-terminals electrically connectable to the test equipment and disposed proximate the second ends of the members of the set of n conductors; and
   - a second set of electrical connections, each connection of the second set being between a respective member of the set of electrical terminals and the second end of an associated conductor in the set of n conductors.

5,463,325
APPARATUS FOR MEASURING CHARACTERISTICS OF ELECTRONIC PARTS

Toshifumi Fujii, Kyoto, Japan, assignor to Rohm Co., Ltd., Kyoto, Japan
Continuation of Ser. No. 30,798, Mar. 12, 1993, abandoned. This application Jul. 29, 1994, Ser. No. 282,817
Claims priority, application Japan, May 28, 1992, 4-163494
Int. Cl.⁶ G01R *1/067*
U.S. Cl. 324—761 **10 Claims**

1. A measuring apparatus for measuring electrical characteristics of electronic parts comprising:
   - a tray formed with lateral guide edges and with a plurality of vertical recesses for receiving a corresponding plurality of electronic parts having electrodes, each recess in the tray being shaped to receive and retain an individual electronic



part in vertically fixed position in the recess and in laterally fixed position in the tray with respect to the lateral guide edges with the electrodes exposed for vertical access by a measuring means;

measuring means having a plurality of resiliently supported measuring terminals positioned according to the positions of the electrodes of the plurality of electronic parts mounted on the tray; and

drive means for moving the tray and the measuring means relatively to each other to thereby make the respective electrodes of the plurality of electronic parts mounted on the tray engage with corresponding measuring terminals in the measuring means.

5,463,326

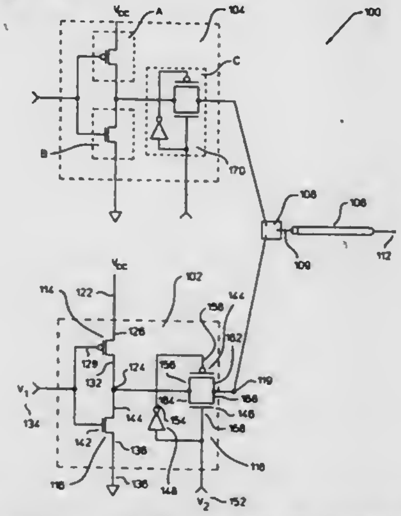
OUTPUT DRIVERS IN HIGH FREQUENCY CIRCUITS

Prasad A. Raje, Fremont, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Apr. 13, 1993, Ser. No. 46,540

Int. Cl.^{6} H03K *3/26*

U.S. Cl. 326—30 **12 Claims**



1. A high frequency circuit comprising an output driver driving an output transmission line, the output transmission line having a characteristic impedance Zo and having a first and a second end, the driver comprising:

a pull-up section connected between a first terminal and a second terminal, the pull-up section responding to an input signal to provide a low impedance current path between the first terminal and the second terminal for establishing a first logic level at the second terminal if the input signal assumes a second logic level, the low impedance current path having an impedance Zd;

a pull-down section connected between a third terminal and the second terminal, the pull-down section responding to the input signal to provide a low impedance current path between the third terminal and the second terminal for establishing the second logic level at the second terminal if the input signal assumes the first logic level, the low impedance current path having an impedance that is substantially equal to Zd; and

a tri-state section, having an output, connected between the second terminal and the first end of the output transmission line, responsive to a control signal to assume one of a high impedance state and a low impedance state, the tri-state section, in its high impedance state, substantially isolating the second terminal from the output transmission line, and the tri-state section, in its low impedance state, coupling the second terminal to the output transmission line through an impedance Zc that is substantially equal to (Zo–Zd).

5,463,327

PROGRAMMABLE MULTIPLEXER LOGIC CELL

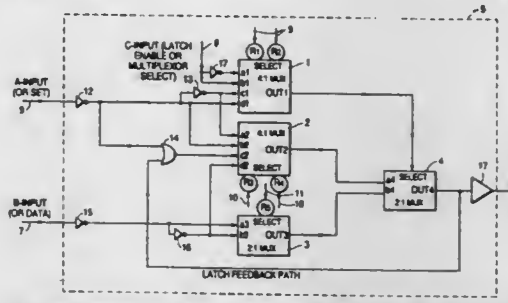
Neil S. Hastie, Plymouth, United Kingdom, assignor to Plessey Semiconductors Limited, Wiltshire, United Kingdom

Filed May 19, 1993, Ser. No. 63,557

Claims priority, application United Kingdom, Jun. 2, 1992, 9211681

Int. Cl.^{6} H03K *19/173*

U.S. Cl. 326—37 **16 Claims**



1. A programmable logic cell having first and second inputs and comprising first and second 4 to 1 multiplexors and third and fourth 2 to 1 multiplexors each having a plurality of inputs and a single output and being controlled by a respective control signal; and wherein: the fourth 2 to 1 multiplexor is controlled by the output of the first multiplexor; the fourth multiplexor ha the outputs of the second and third multiplexors as its two inputs; the output of the fourth multiplexor provides the output of the logic cell; the first input of the logic cell is connected via an invertor to (1) a fourth input of the first multiplexor, (2) a second input of the second multiplexor, (3) a third input of the first multiplexor and a first input of the second multiplexor via a further invertor, and (4) a third input of the second multiplexor; and the second input of the logic cell is connected via an invertor to (1) a first input of the third multiplexor, and (2) to a fourth input of the second multiplexor and a second input of the third multiplexor via another inverter.

5,463,328

EXPANDED PROGRAMMABLE LOGIC ARCHITECTURE

L. Todd Cope, San Jose, and James A. Watson, Santa Clara, both of Calif., assignors to Altera Corporation, San Jose, Calif.

Continuation of Ser. No. 28,046, Mar. 8, 1993, abandoned. This application Nov. 10, 1994, Ser. No. 337,579

Int. Cl.^{6} H03K *19/177*

U.S. Cl. 326—41 **22 Claims**

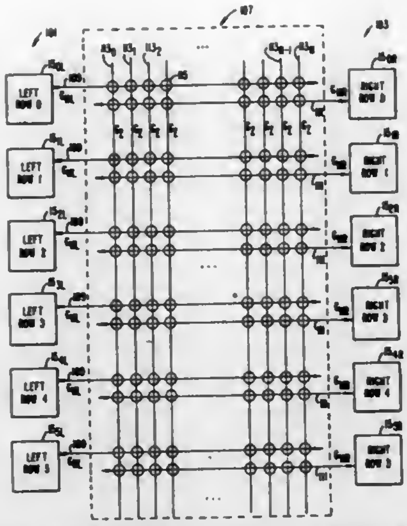
1. A reprogrammable logic device in an integrated circuit comprising:

a first array of reprogrammable logic units, said first array arranged in rows and columns to form a first hemisphere;

a second array of reprogrammable logic units, said second array arranged in rows and columns to form a second hemisphere;

a first set of horizontal conductors arranged along said rows of said first array of reprogrammable logic units in said first hemisphere, said first set of horizontal conductors selectively connectable to inputs or outputs of said first array of reprogrammable logic units;

a second set of horizontal conductors arranged along said rows of said second array of reprogrammable logic units in said



second hemisphere, said second set of horizontal conductors selectively connectable to inputs or outputs of said second array of reprogrammable logic units;

- a first set of vertical conductors arranged along side columns of said first array of reprogrammable logic units in said first hemisphere, said first set of vertical conductors selectively connectable to said first set of horizontal conductors;
- a second set of vertical conductors arranged along said columns of said second array of reprogrammable logic units in said second hemisphere, said second set of vertical conductors selectively connectable to said second set of horizontal conductors; and
- a plurality of global interconnect conductors between said first and second hemispheres, said global interconnect conductors selectively connectable to selected said first and said second horizontal conductors and not to said inputs or outputs of said first array of reprogrammable logic units or to said inputs or outputs of said second array of reprogrammable logic units, whereby signals in said first hemisphere may be routed to selected locations in said second hemisphere.

5,463,329
INPUT CIRCUIT FOR LEVEL-SHIFTING TTL OR CMOS TO ECL SIGNALS

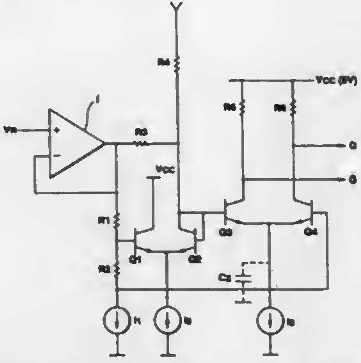
Somei Kawasaki, Urawa, and Masami Iseki, Yokohama, both of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 8, 1994, Ser. No. 225,311

Claims priority, application Japan, Apr. 19, 1993, 5-091332

Int. Cl.^{6} H03K *19/018*

U.S. Cl. 326—77 **8 Claims**



1. An input circuit for converting an input signal to an output signal, comprising:

- means for providing first and second reference voltages;
- a first level comparator having a first input to which the input signal is provided and a second input to which the first reference voltage is provided for comparison with the input signal, and an output at which the output signal is manifested; and
- a second level comparator having a first input connected to said first input of said first level comparator for receiving the input signal, and a second input to which the second reference voltage is provided for comparison with the input signal, with said second level comparator limiting the voltage at said first input of said first level comparator to substantially the second reference voltage whenever the input signal exceeds the second reference voltage.

5,463,330
CMOS INPUT CIRCUIT

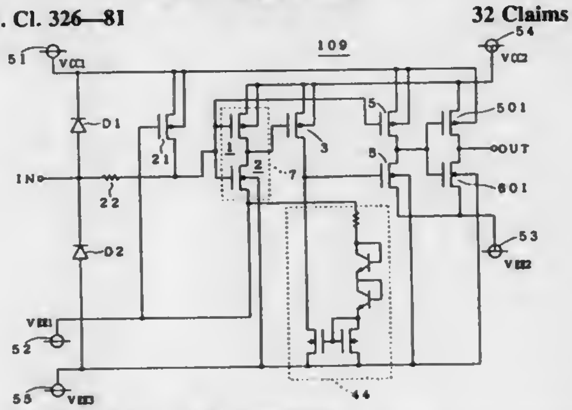
Kazuhito Tsuchida, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 12, 1994, Ser. No. 273,935

Claims priority, application Japan, Aug. 20, 1993, 5-206270

Int. Cl.^{6} H03K *19/0175*

U.S. Cl. 326—81 **32 Claims**



1. A CMOS input circuit, comprising:

- (a) an input terminal for receiving an input signal corresponding to a first logic level or a second logic level which are complementary to each other;
- (b) an invertor for receiving said input signal to output an intermediate signal which takes a first potential corresponding to said first logic level when said input signal corresponds to said second logic level, or takes a second potential corresponding to said second logic level when said input signal corresponds to said first logic level;
- (c) a switching element having a first end provided with a third potential corresponding to said first logic level and a second end, for insulating said first and second ends when said intermediate signal corresponds to said first logic level, or conducting said first and second ends when said intermediate signal corresponds to said second logic level;
- (d) a first MOS transistor having a gate provided with said input signal, a source provided with a fourth potential corresponding to said first logic level and a drain, for turning off when said input signal corresponds to said first logic level, or turning on when said input signal corresponds to said second logic level;
- (e) a second MOS transistor having a gate connected to said second end of said switching element, a source provided with a fifth potential corresponding to said second logic level and a drain, for turning on when said third potential is applied to said gate;
- (f) a current supply circuit connected to said gate of said second MOS transistor, for supplying a current flowing in a direction to turn off said second MOS transistor; and
- (g) an output terminal coupled to said drains of said first and second MOS transistors in common.

5,463,331

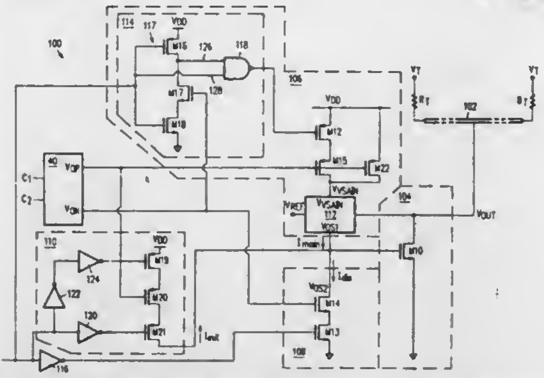
PROGRAMMABLE SLEW RATE CMOS BUFFER AND TRANSMISSION LINE DRIVER WITH TEMPERATURE COMPENSATION

James R. Kuo, Cupertino, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Continuation of Ser. No. 73,679, Jun. 8, 1993, abandoned. This application Feb. 2, 1995, Ser. No. 384,358

Int. Cl.^{6} H03K *19/0185*

U.S. Cl. 326—86 **24 Claims**



1. A driver for providing binary signals from a data system to a transmission line, the driver comprising:

an output node for connection to the transmission line;

a first field-effect transistor (FET) coupled between the output node and ground for conducting current from the output node to ground;

a main charging stage for providing a main charging current to the gate of the first FET for a period of time not to exceed a main charging time period, the main charging stage including a first logic circuit, responsive to the data system, for setting the main charging time period, the first logic circuit having a propagation delay time that is approximately equal to the main charging time period;

a discharging stage for providing a discharge current from the gate of the first FET to ground; and

programming circuitry for programming the length of the main charging time period by adjusting the propagation delay time of the first logic circuit.

5,463,332

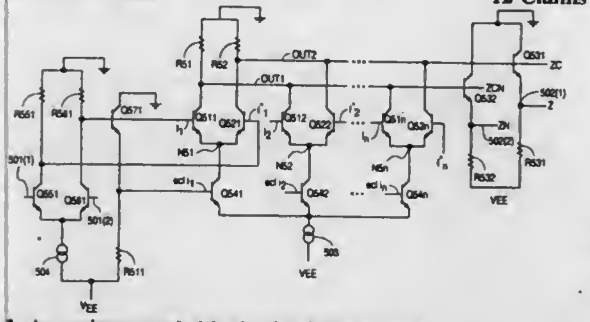
MULTIPLE DIFFERENTIAL INPUT ECL OR/NOR GATE

Loren W. Yee, San Francisco, and Nguyen X. Sinh, San Jose, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Jul. 22, 1994, Ser. No. 279,035

Int. Cl.^{6} H03K *19/20*

U.S. Cl. 326—126 **12 Claims**



1. An emitter-coupled logic circuit comprising:

first and second transistors having emitters connected to a first node, the first transistor having a first collector and a first base connected to receive a first biasing signal, and the second transistor having a second collector and a second base connected to receive a second biasing signal, wherein the first and second biasing signals are logical compliments, and wherein the first collector is connected to a first voltage potential through a first resistor and the second collector is connected to the first voltage source through a second resistor;

a driving circuit, the driving circuit receiving an input signal and generating the first and second biasing signals in response to the input signal, the driving circuit including:

third and fourth transistors having emitters connected to a second node, the third transistor having a third connector connected to the first base and a third base connected to receive the input signal, the fourth transistor having a fourth collector connected to the second base, wherein the third collector is connected to the first voltage potential through a third resistor and the fourth collector is connected to the first voltage source through a fourth resistor;

a first constant current source connected to the second node such that a sum of currents passing through the third and fourth transistors is constant, wherein the first constant current source is connected to the second voltage potential;

a fifth transistor having a fifth collector connected to the first voltage source, a fifth base connected to the first biasing signal, and a fifth emitter connected to the second voltage potential through a fifth resistor;

a sixth transistor having a sixth collector connected to the first node, a sixth base connected to the fifth emitter, and a sixth emitter; and

a second constant current source connected to the sixth emitter.

5,463,333

PROXIMITY SWITCHES

Douglas W. Calder, Berkshire, and Arthur J. Bizley, Wiltshire, both of, Great Britain, assignors to Square D Company, Palatine, Ill.

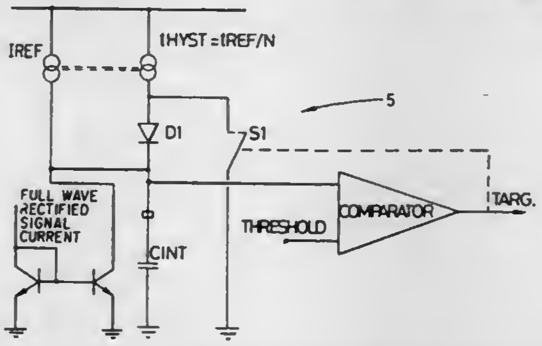
PCT No. PCT/US92/11231, § 371 Date Jun. 15, 1994, § 102(e) Date Jun. 15, 1994

PCT Filed Dec. 28, 1992, Ser. No. 244,828

Claims priority, application United Kingdom, Dec. 31, 1991, 9127572

Int. Cl.^{6} H03K *3/037;5/153;* **G06G** *7/64*

U.S. Cl. 327—78 **9 Claims**



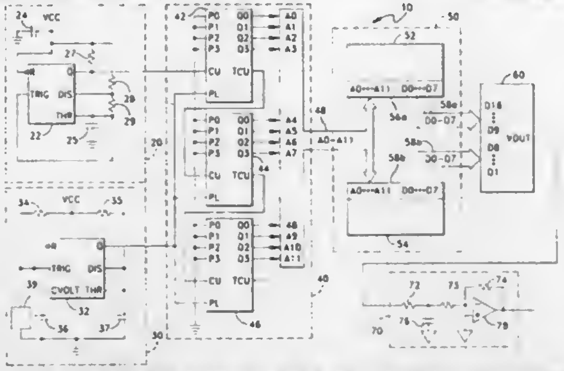
1. An integrator with switched hysteresis for inductive proximity switches comprising a reference current source connected between a reference voltage supply rail and one side of a current mirror, the other side of the current mirror being connected to a proximity switch rectifier, the one side of the current mirror further being connected in parallel with a capacitor and also to one input of a two input comparator, the other input to the comparator being held at a threshold level, wherein a fixed hysteresis current source is provided in parallel with the reference current source, the fixed hysteresis current source producing a switchable current which is a fixed proportion of the current of the reference current source, the fixed hysteresis current source being switched on (off) when a target is detected and off (on) when no target is detected.

5,463,334
ARBITRARY WAVEFORM GENERATOR

Maurice J. Griffin, Tiverton, and Glenn S. Sugawara, Portsmouth, both of R.I., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 2, 1995, Ser. No. 382,708
Int. Cl.⁶ H03K *3/84*

U.S. Cl. 327—106 **10 Claims**



1. An apparatus for generating arbitrary waveforms comprising:

address clocking means for providing an address clock signal, said address clock signal comprising a series of regularly spaced discreet output signals;

cycle clocking means, including trigger means, for providing a cycle clock signal having a predetermined duration upon actuating said trigger means;

address generation means, connected to receive said address clock signal and said cycle clock signal, for providing an address series, said address series comprising a separate address for each of said discreet output signals received while said cycle clock signal is present;

data transfer means, connected to receive said address series, for introducing digital data from a non-volatile random access memory (NVRAM) device into said apparatus, said data transfer means being responsive to said address series and providing a digital output series comprising said digital data;

converter means, connected to receive said digital output series, for converting said digital output series to a continuous analog signal; and

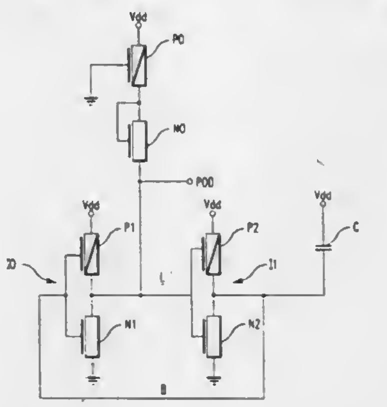
filter means, connected to said converter means, for conditioning said continuous analog signal.

5,463,335
POWER UP DETECTION CIRCUITS

Sridhar Divakaruni, South Burlington; Jeffrey H. Dreibelbis, Williston; Wayne F. Ellis; Anatol Furman, both of Jericho, and Howard L. Kalter, Colchester, all of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 30, 1992, Ser. No. 969,594
Int. Cl.⁶ H03K *17/22*

U.S. Cl. 327—143 **20 Claims**



4. A power up detection circuit comprising

a power supply terminal,

an output terminal,

a voltage dependent current source connecting said power supply terminal to said output terminal, and

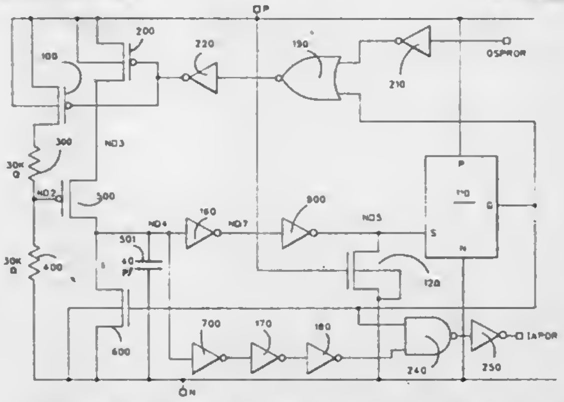
a latch having an inputs, said output terminal being coupled the input of said latch.

5,463,336
SUPPLY SENSING POWER-ON RESET CIRCUIT

Rajiv Gupta, Brea; Raouf Halim, and Daryush Shamlou, both of Laguna Niguel, all of Calif., assignors to Rockwell International Corporation, Seal Beach, Calif.

Filed Jan. 27, 1994, Ser. No. 186,939
Int. Cl.⁶ H03K *17/22*

U.S. Cl. 327—143 **8 Claims**



1. A circuit for detecting a predetermined system reset signal caused by the turning on of power supply of an external electronic system, comprising:

latch means coupled to said power supply having a SET input and an output, said output of said latch means being reset to a first predetermined state during power-on;

first n-type transistor coupled to said latch means having its gate coupled to a first terminal of said power supply, its source coupled to a second terminal of said power supply and its drain coupled to said SET input for de-activating said SET signal upon power-on;

feedback means for receiving said output from said latch means and said predetermined system reset signal, said feedback means activating its output when both of said first predetermined state from said latch means' output and said predetermined system reset signal are present;

delay means coupled to the output from said feedback means and to said latch means, said delay means activating its output a predetermined time after said delay means receives an activated output from said feedback means, said activated output from said delay means setting said latch means to a second predetermined state which de-activates said feedback means, said feedback means remaining de-activated when said predetermined system reset signal is applied while the power of said electronic system is already on;

said latch means comprising:

first p-type transistor having its source coupled to said first terminal of said power supply;

a resistor coupled between said first terminal of said power supply and the source of said first p-type transistor;

second n-type transistor having its drain coupled to the drain of said first p-type transistor to form a first node, both gates of said first p- and said second n-type transistors being connected together to form a second node, said first node generating said output for said latch means, said second n-type transistor having a wider dimension than said first p-type transistor;

a capacitor coupled between said first node and the source terminal of said second n-type transistor;

second p-type transistor having its source coupled to said first terminal of said power supply and its drain to said second node;

third n-type transistor having its drain coupled to said second node and its gate coupled to said first node, said second p-type transistor having a wider dimension than said third n-type transistor;

fourth n-type transistor having its drain coupled to said second node, the gate of said fourth n-type transistor coupled to receive said SET input for said latch means; and

wherein said latch means forces its output to said first predetermined state upon power-on and to said second predetermined state only upon receiving an activated SET signal.

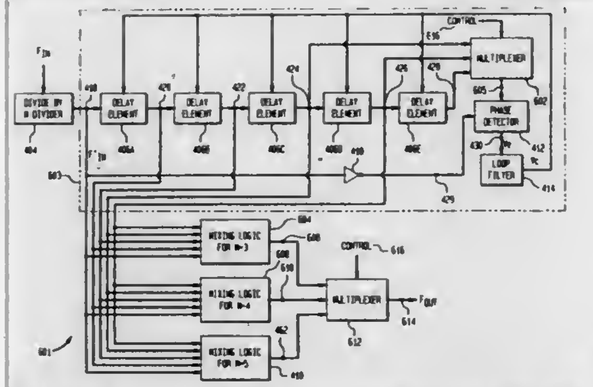
5,463,337

DELAY LOCKED LOOP BASED CLOCK SYNTHESIZER USING A DYNAMICALLY ADJUSTABLE NUMBER OF DELAY ELEMENTS THEREIN

Robert H. Leonowich, Temple, Pa., assignor to AT&T Corp., Murray Hill, N.J.

Filed Nov. 30, 1993, Ser. No. 160,107
Int. Cl.^{6} H03K *5/159*

U.S. Cl. 327—158 **6 Claims**



1. A delay-locked-loop based clock synthesizer for generating, from a reference signal, a clock signal having a frequency different from a frequency of the reference signal, comprising:

a delay-locked-loop circuit, comprising

a controllable delay circuit comprising a plurality of controllable delay elements serially connected to one another, each of said delay elements delaying said reference signal by an adjustable quantum of time such that said delay elements generate a plurality of delayed signals offset in time from one another and from said reference signal,

a first multiplexer, coupled to two or more of said delay elements, for receiving the delayed signals generated by said two or more of said delay elements, and for routing one of said received delayed signals to an output of said first multiplexer,

a phase detector, connected to said output of said first multiplexer, for receiving said routed delayed signal and said reference signal, and for generating a control signal indicative of a difference between a phase of said routed delayed signal and a phase of said reference signal, and

feedback means, connected to said delay elements and said phase detector, for transferring said control signal from said phase detector to said delay elements, wherein each of said delay elements adjusts, in accordance with said control signal, said quantum of time by which they each delay said reference signal, such that said phase of said reference signal is synchronized with said phase of said routed delayed signal;

one or more mixing circuits, each of said mixing circuits connected to said controllable delay circuit and associated with one of said two or more delay elements, said mixing circuits comprising combinational networks for logically combining said delayed signals such that said mixing circuits generate logically combined signals; and

a second multiplexer, connected to said mixing circuits, for receiving said logically combined signals and for routing one of said logically combined signals to an output of said second multiplexer, wherein said routed logically combined signal represents said clock signal.

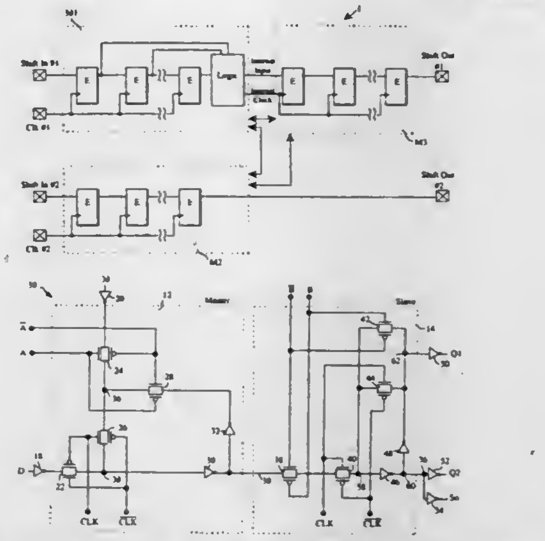
5,463,338

DUAL LATCH CLOCKED LSSD AND METHOD

Stephen A. Yurash, Palo Alto, Calif., assignor to VLSI Technology, Inc., San Jose, Calif.

Filed Jun. 7, 1993, Ser. No. 75,363
Int. Cl.^{6} H03K *3/289*

U.S. Cl. 327—202 **23 Claims**



1. An integrated circuit with dual latch clocked LSSD comprising:

a first module responsive to a first external clock and a first external shift input and operative to produce a first shift output, wherein said first module is provided with a plurality of dual latch clocked LSSDs connected in series, each dual latch clocked LSSD having:

a first latch;

a second latch; and

circuitry coupling said first latch to said second latch to provide at least three operational modes of said at least one dual latch clocked LSSD including a functional mode, a capture mode, and a shift mode; and

an internal module responsive to an internal clock and said first shift output of said first module, said internal module being operative to produce a shift output.

5,463,339

AMORPHOUS, THIN FILM TRANSISTOR DRIVER/ RECEIVER CIRCUIT WITH HYSTERESIS

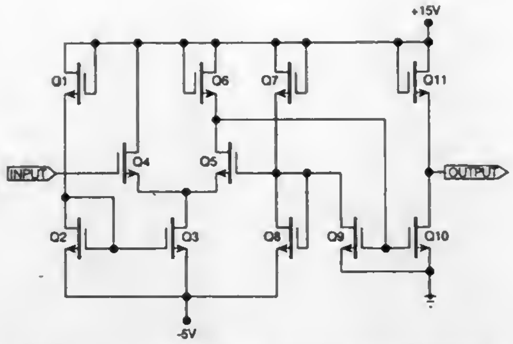
Salvatore R. Riggio, Jr., Boca Raton, Fla., assignor to International Business Machines Incorporated, Armonk, N.Y.

Continuation of Ser. No. 175,028, Dec. 29, 1993, abandoned. This application Jun. 16, 1994, Ser. No. 261,351
Int. Cl.^{6} H03K *3/295*

U.S. Cl. 327—206 **1 Claim**

1. A driver circuit, comprising:

a comparator circuit including: first and second transistors interconnected to form a differential pair; a current regulating circuit having a third transistor coupled to a first element of each of said first and second transistors; and a load circuit having a fourth transistor coupled to a second element of said second transistor;



a variable voltage divider circuit having a fifth transistor coupled between said second element and a third element of said second transistor; and

an inverter circuit having sixth and seventh transistors, said second element of said second transistor being coupled to said inverter circuit;

wherein said first, second, third, fourth, fifth, sixth, and seventh transistors are amorphous, thin film transistors of the same type, N or P.

5,463,340

PHASE CLOCKED LATCH HAVING BOTH PARALLEL AND SHUNT CONNECTED SWITCHES FOR TRANSMISSION GATES

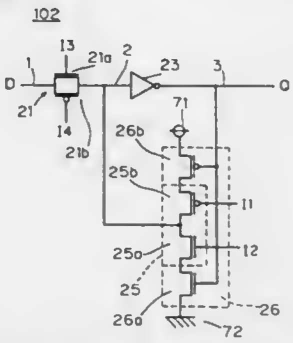
Akihiko Takabatake; Shinichi Uramoto, and Shinichi Nakagawa, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 15, 1993, Ser. No. 76,649

Claims priority, application Japan, Jun. 23, 1992, 4-164826

Int. Cl.^{6} H03K ***3/356***

U.S. Cl. 327—211 **12 Claims**



1. A semiconductor device, comprising:

a unit latch circuit consisting of a pair of half-latch circuits, and

a control signal supplier processing a clock signal after first and second processing periods of time to produce and apply respective first and second control signals substantially identical in pulse width with the clock signal for applying the first and second control signals to each of said unit latch circuits; wherein

said second processing period of time is equal to or longer than and said first processing period of time;

each of said pair of half-latch circuits including

(a) an input terminal and an output terminal,

(b) a first switch connected to said input terminal for turning on or off in the control of said second control signal,

(c) first signal transmitting means having an input end connected through said first switch to said input terminal and an output end connected to said output terminal, for practicing a logic inversion, and

(d) second signal transmitting means having an input end connected to an output end of said first signal transmitting means and an output end connected to an input end of said first signal transmitting means, for, in accordance with said first control signal, outputting a feedback signal which is obtained by practicing a logic inversion to an output from said first signal transmitting means,

wherein said control signal supplier further produces and applies a third control signal, which has a negative logic relation with said first control signal, to said half-latch circuits;

said second signal transmitting means including

(d-3) a signal processing unit having an input end connected to said input end of said second signal transmitting means and a pair of output ends either of which receives said feedback signal, and

(d-4) a second switch having a pair of input ends connected to said pair of output ends of said signal processing unit and an output end for selectively outputting said feedback signal; wherein

(d-4-1) said second switch includes first and second unit switches connected in series between said pair of input ends of said second switch for operating in accordance with signals which are opposite in phase to each other,

(d-4-2) said first and second unit switches are connected commonly to said output end of said second signal transmitting means,

(d-4-3) said first unit switch turning on and off in the control of said first control signal, and

(d-4-4) said second unit switch turning on and off in the control of said third control signal; and

wherein said control signal supplier further produces and applies a fourth control signal, which has a negative logic relation with said second control signal, to said half-latch circuits;

(b-1) said first switch including third and fourth unit switches connected in parallel with each other to operate in accordance with signals which are opposite in phase to each other,

(b-2) said third unit switch turning on and off in the control of said second control signal, and

(b-3) said fourth unit switch turning on and off in the control of said fourth signal.

5,463,341

ELECTRONIC MULTIPLE-VALUED REGISTER

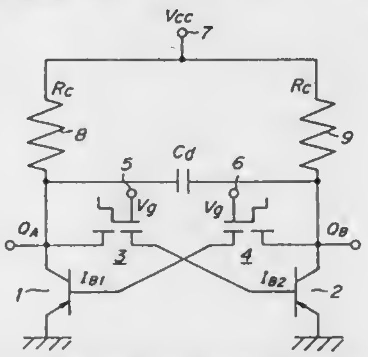
Shinji Karasawa, Natori City, Japan, assignor to Miyagi National College of Technology, Natori City, Japan

Filed Jul. 29, 1993, Ser. No. 98,830

Claims priority, application Japan, Dec. 9, 1992, 4-329398

Int. Cl.^{6} H03K ***17/693***

U.S. Cl. 327—219 **15 Claims**



1. An electronic multiple-valued register comprising:

a first inverted amplifier having an input and an output;

a second inverted amplifier having an input and an output; and

a first electronic element having a first terminal side connected to said output of said first inverted amplifier and a second terminal side connected to said input of said second inverted amplifier and a second electronic element having a first terminal side connected to said output of said second inverted amplifier and a second terminal side connected to said input of said first inverted amplifier, said first and second electronic elements each having a substantially stair-shaped voltage-current characteristic so as to provide more than two stable levels.

5,463,342

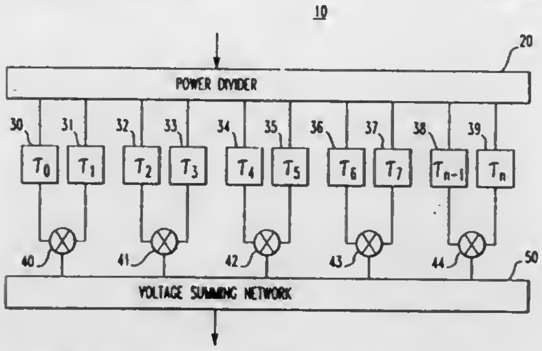
METHOD AND APPARATUS FOR ENHANCING SIGNAL-TO-NOISE RATIO AND IMPROVING SENSITIVITY AND SIGNAL DETECTOR EMPLOYING SAME

Glenn B. Guard, Laurel, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 30, 1993, Ser. No. 125,266

Int. Cl.⁶ H03H *11/26*; H03B *21/00*

U.S. Cl. 327—269 **8 Claims**



2. An apparatus comprising:

power dividing means for dividing an input signal into a plurality of divided signals of equal power;

a plurality of delay means, connected to said power dividing means, each for introducing a delay into a corresponding one of said plurality of divided signals;

a plurality of mixing means, each associated with and connected to a pair of said plurality of delay means, for mixing together pairs of the plurality of divided signals delayed by said delay means; and

voltage summing means for receiving and summing outputs of said plurality of mixing means.

5,463,343

ADJUSTABLE DELAY CIRCUIT OF CURRENT INTENSITY HAVING DELAY AS A HYPERBOLIC FUNCTION

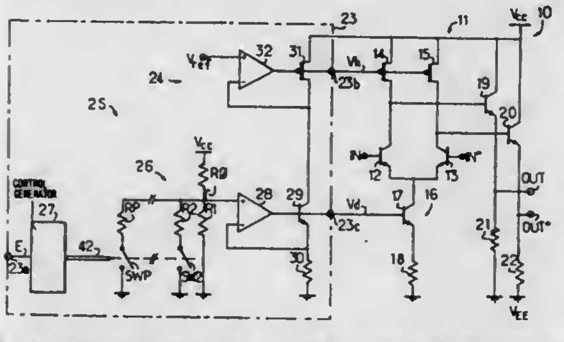
Roland Marbot, Versailles, France, assignor to Bull, S.A., Paris, France

Filed Dec. 18, 1991, Ser. No. 809,181

Claims priority, application France, Dec. 27, 1990, 90 16339

Int. Cl.⁶ H03H *11/26;17/296;17/28*

U.S. Cl. 327—270 **19 Claims**



1. An adjustable delay device (10), comprising at least one differential amplifier (11) having a current source (16) for providing a polarization current (I), two adjustable resistive load elements (14, 15) connected to the current source, an adjusting circuit (23, 25) connected to the current source for varying the polarization current hyperbolically to produce an adjustable delay and maintaining means (23, 25) connected to the current source for maintaining the voltage across each of the adjustable load elements at a substantially constant value (V_{REF}).

5,463,344

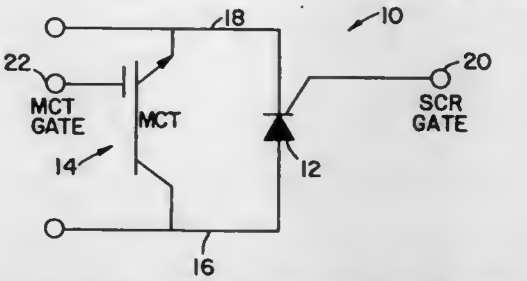
FAST TURN ON SWITCH CIRCUIT WITH PARALLEL MOS CONTROLLED THYRISTOR AND SILICON CONTROLLED RECTIFIER

Victor A. K. Temple, Clifton, N.Y., assignor to Harris Corporation, Melbourne, Fla.

Filed Apr. 26, 1993, Ser. No. 51,839

Int. Cl.⁶ H03K *17/04*

U.S. Cl. 327—374 **28 Claims**



5. An electrical switch circuit comprising a MOS controlled thyristor in a first switched path that is connected substantially in parallel with a second switched path comprising a silicon controlled rectifier.

5,463,345

CIRCUIT FOR CONVERTING UNIPOLAR INPUT TO BIPOLAR OUTPUT

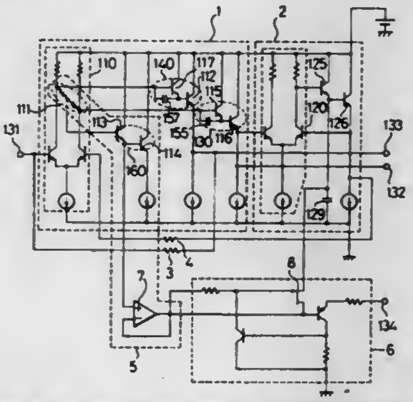
Takeshi Nagahori, Tokyo; Toshimasa Oami, and Noriko Anzai, both of Kanagawa, all of, Japan, assignors to NEC Corporation, Japan

Filed Dec. 21, 1993, Ser. No. 172,083

Claims priority, application Japan, Jan. 7, 1993, 5-000908; Jun. 28, 1993, 5-155956

Int. Cl.⁶ H03K *17/04*

U.S. Cl. 327—374 **13 Claims**



1. A circuit for converting unipolar input to bipolar output comprising:

a differential amplifier including a first emitter-coupled amplifying circuit and an emitter follower output stage, said emitter follower output stage including two pairs of transistors each pair comprising a first stage transistor and a second stage transistor having a darlington connection with said first stage transistor;

a peak detector including a second emitter-coupled amplifying circuit having an identical DC operation point with said first emitter-coupled amplifying circuit, a current blocking transistor a base of which is connected to the positive output of said second emitter-coupled amplifying circuit and an emitter of which is connected to a hold capacitor for maintaining peak values, and a buffer transistor a base of which is connected to an emitter of said current blocking transistor and an emitter of which is connected to the negative input of said second emitter-coupled amplifying circuit; and

first and second feedback resistors;

negative output of said differential amplifier being fed back to a positive input of said differential amplifier through said first feedback resistor, and a positive output of said differential amplifier being fed back to a negative input of said differential amplifier through said peak detector and said second feedback resistor, and

a capacitor disposed in parallel between the base and emitter of at least said first stage transistor connected to said first emitter-coupled amplifying circuit among said pair of transistors.

5,463,346

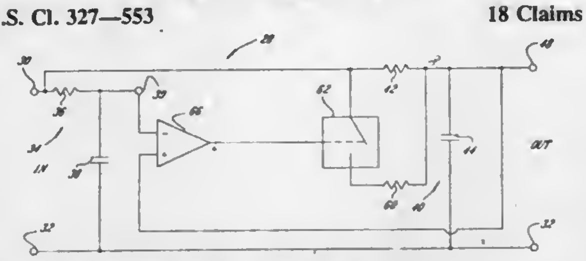
FAST RESPONSE LOW-PASS FILTER

James R. Brooks, Beaverton, Oreg., assignor to SpaceLabs Medical, Inc., Redmond, Wash.

Filed Apr. 7, 1994, Ser. No. 224,644

Int. Cl.⁶ H03H *11/04*

U.S. Cl. 327—553 **18 Claims**



1. A fast response time low-pass filter comprising:

a first low-pass filter receiving an input signal and outputting a first output signal, said first filter having a relatively high cutoff frequency;

a second low-pass filter receiving said input signal and outputting a second output signal that is used as an output signal for said fast response time low-pass filter, said second low-pass filter having a cutoff frequency that is changed from a relatively low frequency to a relatively high frequency in response to a control signal; and

a comparator connected to said first and second filters, said comparator comparing the respective values of said first and second output signals to each other and generating said control signal when the difference between said first and second output signals exceed a predetermined value whereby said fast response time low-pass filter has a relatively low cutoff frequency until said input signal changes at a sufficient rate to cause said comparator to generate said control signal at which point the response time of said second filter changes to said relatively high cutoff frequency.

5,463,347

MOS UNI-DIRECTIONAL, DIFFERENTIAL VOLTAGE AMPLIFIER CAPABLE OF AMPLIFYING SIGNALS HAVING INPUT COMMON-MODE VOLTAGE BENEATH VOLTAGE OF LOWER SUPPLY AND INTEGRATED CIRCUIT SUBSTRATE

Steven C. Jones, Garland, Tex.; Subhashish Mukherjee, Bangalore, Ind., and Stephen C. Kwan, Plano, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 12, 1994, Ser. No. 353,604

Int. Cl.⁶ H03F *3/45;3/16*

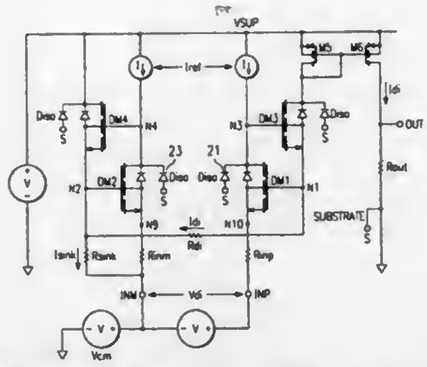
U.S. Cl. 330—253 **16 Claims**

1. An amplifier capable of accepting input common mode voltages below the circuit reference voltage which comprises:

(a) a differential voltage input having a higher voltage terminal and a lower voltage terminal;

(b) a first NMOS transistor coupled between a voltage supply and said higher voltage terminal;

(c) a second NMOS transistor coupled between said voltage supply and said lower voltage terminal;



(d) a third NMOS transistor coupled between said voltage supply and the gate of said first transistor;

(e) a fourth NMOS transistor coupled between said voltage supply and the gate of said second transistor;

(f) a sink resistor coupled between the gate of said second transistor and said lower voltage terminal; and

(g) a differential resistor coupled between the gates of said first and second transistors.

5,463,348

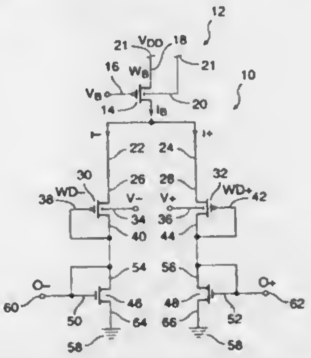
CMOS LOW-POWER, WIDE-LINEAR-RANGE, WELL-INPUT DIFFERENTIAL AND TRANSCONDUCTANCE AMPLIFIERS

Rahul Sarpeshkar, and Carver A. Mead, both of Pasadena, Calif., assignors to California Institute of Technology, Pasadena, Calif.

Filed Jul. 27, 1994, Ser. No. 281,218

Int. Cl.⁶ H03F *3/45*

U.S. Cl. 330—253 **9 Claims**



1. A differential amplifier disposed in a semiconductor substrate, said differential amplifier comprising:

a bias current source;

a first well-type differential transistor disposed in a first well having a source connected to said bias current source, and a gate and a drain connected together, wherein said first well is connected to a first voltage input node;

a second well-type differential transistor disposed in a second well having a source connected to said bias current source, and a gate and a drain connected together, wherein said second well is connected to a second voltage input node;

a first native feedback transistor having a gate and a drain connected together and to both said gate and said drain of said first well-type differential transistor, and a source connected to Ground,

a second native feedback transistor having a gate and a drain connected together and to both said gate and said drain of said second well-type differential transistor, and a source connected to Ground;

a first output node connected to said gate and said drain of said first native feedback transistor; and

a second output node connected to said gate and said drain of said second native feedback transistor.

5,463,349

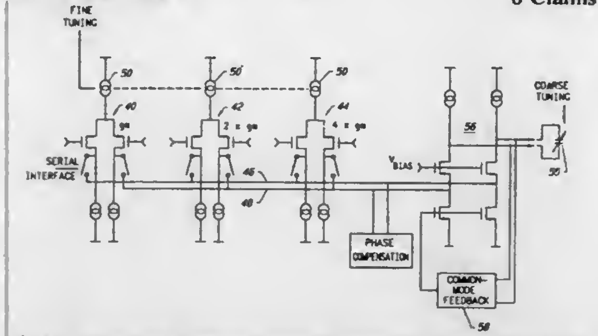
PROGRAMMABLE OPERATION TRANSCONDUCTANCE AMPLIFIER

Corey D. Petersen, Pleasanton; Douglas L. Hiser, Berkeley, and Jaime E. Kardontchik, Sunnyvale, all of Calif., assignors to IMP, Inc., San Jose, Calif.

Division of Ser. No. 46,408, Apr. 12, 1993, Pat. No. 5,325,317, which is a division of Ser. No. 739,015, Jul. 31, 1991, Pat. No. 5,245,565. This application Jun. 20, 1994, Ser. No. 262,156

Int. Cl.^{6} H03G *3/30*

U.S. Cl. 330—254 **8 Claims**



4. An operational transconductance amplifier comprising a plurality of transconductance elements individually connected to a controllable current source and switchably connected to a first common current line, wherein the transconductance of said operational transconductance amplifier is controllable by controlling the current through said controllable current source and selectively connecting said transconductance elements to said first common current line.

5,463,350

BIASING CIRCUIT OF AN AMPLIFIER

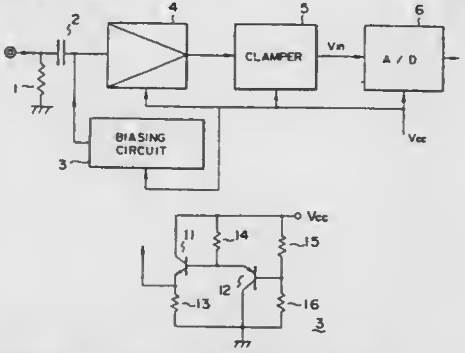
Hirotaka Yamaji, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Dec. 15, 1994, Ser. No. 356,488

Claims priority, application Japan, Dec. 24, 1993, 5-326790

Int. Cl.^{6} H03F *3/04*

U.S. Cl. 330—296 **3 Claims**



1. A biasing circuit of an amplifier comprising:

a voltage divider for generating a voltage between a voltage Vcc at the positive terminal of a power supply of said amplifier and a voltage −Vd at the negative terminal of said power supply;

a pnp transistor, with its emitter connected to said voltage Vcc through a resistor, with its collector connected to said voltage −Vd, and with its base current supplied through said voltage divider;

an npn transistor with its collector connected to said voltage Vcc, with its emitter connected to said voltage −Vd through an emitter follower resistor, and with its base current supplied through said emitter of said pnp transistor; and

means for supplying a biasing voltage to said amplifier from said emitter of said npn transistor.

5,463,351

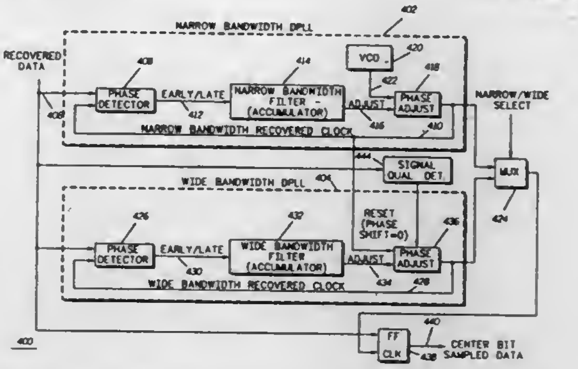
NESTED DIGITAL PHASE LOCK LOOP

Paul D. Marko, Ft. Lauderdale; Craig P. Wadin, Sunrise, and David L. Brown, Miami, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 29, 1994, Ser. No. 314,830

Int. Cl.^{6} H03L *7/07;7/10*

U.S. Cl. 331—1 A **21 Claims**



14. A nested digital phase locked loop (DPLL) circuit providing accurate center bit sampling of recovered data in a digital communication system, comprising:

a narrowband DPLL for receiving recovered data and for providing a first recovered clock signal based on the phase of the recovered data;

a wideband DPLL for receiving the recovered data and for generating a second recovered clock signal in response to the phase of the first recovered clock signal and the phase of the incoming data; and

a means for selecting either the first or second recovered clock signals for center bit sampling the recovered data.

5,463,352

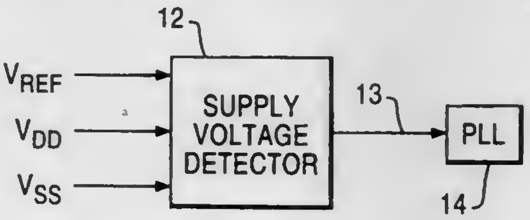
SUPPLY VOLTAGE TOLERANT PHASE-LOCKED LOOP CIRCUIT

Dao-Long Chen, Fort Collins, Colo., assignor to AT&T Global Information Solutions Company, Dayton, Ohio, and Hyundai Electronics America, Milpitas, Calif.

Filed Sep. 23, 1994, Ser. No. 311,469

Int. Cl.^{6} H03L *1/00*

U.S. Cl. 331—1 R **12 Claims**



1. A method for operating a phase-locked loop, comprising the steps of:

detecting a supply voltage; and

adjusting the operating frequency of the phase-locked loop based upon the detected supply voltage.

5,463,353

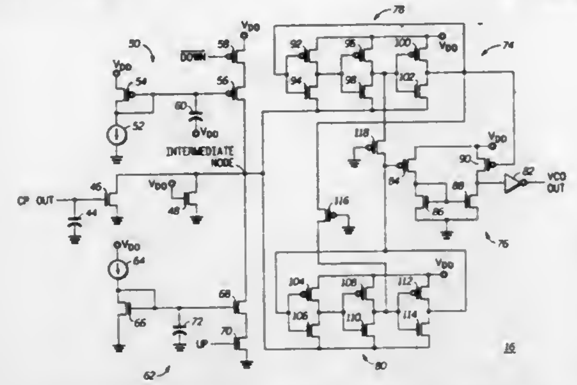
RESISTORLESS VCO INCLUDING CURRENT SOURCE AND SINK CONTROLLING A CURRENT CONTROLLED OSCILLATOR

Roger S. Countryman, Austin, and Jose Alvarez, Leander, both of Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 6, 1994, Ser. No. 300,238

Int. Cl.^{6} H03K *3/03;3/354;* **H03L** *7/099*

U.S. Cl. 331—2 **18 Claims**



1. A resistorless voltage controlled oscillator comprising:

- a capacitor comprising a first terminal and a second terminal, the first terminal receiving an input voltage level, the second terminal receiving a first voltage supply;
- a first transistor comprising a first current electrode, a second current electrode and a control electrode, the first current electrode receiving the first voltage supply, the control electrode coupled to the first terminal of the capacitor, the second terminal coupled to an intermediate node;
- a current sourcing circuit coupled to the intermediate node, the current sourcing circuit sourcing current to the intermediate node responsive to a first control signal;
- a current sinking circuit coupled to the intermediate node, the current sinking circuit sinking current from the intermediate node responsive to a second control signal; and
- a current controlled oscillator coupled to the intermediate node, the current controlled oscillator generating a periodic clocking signal responsive to the current sourced at the intermediate node.

5,463,354

PROXIMITY SWITCHES INCLUDING LONG TAIL PAIR WITH EMITTER FOLLOWER FEEDBACK

Douglas W. Calder, Berkshire, and Arthur J. Bizley, Wiltshire, both of, Great Britain, assignors to Square D Company, Palatine, Ill.

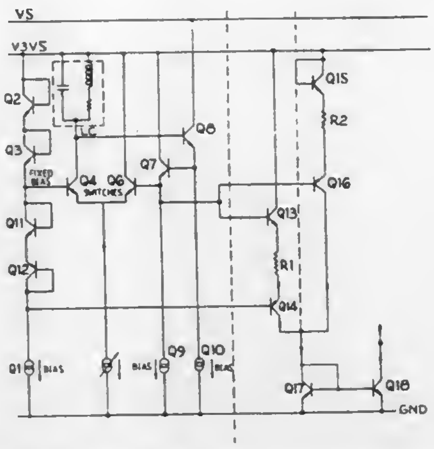
PCT No. PCT/US92/11233, § 371 Date Jun. 15, 1994, § 102(e) Date Jun. 15, 1994, PCT Pub. No. WO93/13436, PCT Pub. Date Jul. 8, 1993

PCT Filed Dec. 28, 1992, Ser. No. 244,827

Claims priority, application United Kingdom, Dec. 31, 1991, 9127570

Int. Cl.^{6} G01V *3/11;* **H03B** *5/12;* **H03K** *17/945*

U.S. Cl. 331—65 **8 Claims**



1. A proximity switch circuit including first and second transistors connected as a long tail pair with an inductive sensing circuit connected to one leg thereof and an emitter follower circuit connected between said one leg and the base of the transistor of the other leg, whereby an oscillator circuit can be provided which is non-critically damped to enable faster speed of operation of the proximity switch.

5,463,355

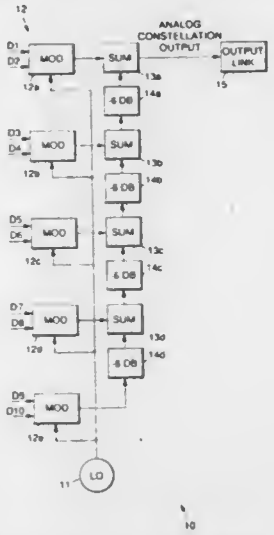
WIDEBAND VECTOR MODULATOR WHICH COMBINES OUTPUTS OF A PLURALITY OF QPSK MODULATORS

Timothy Halloran, Cupertino, Calif., assignor to Loral Aerospace Corp., New York, N.Y.

Filed Jul. 15, 1994, Ser. No. 275,604

Int. Cl.^{6} H04L *27/36*

U.S. Cl. 332—103 **5 Claims**



1. A wideband vector modulator comprising:

- a local oscillator that provides a periodic sinusoidal output signal;
- a plurality of quadrature-phase-shift-key (QPSK) modulator elements that each comprises a GaAs microwave monolithic integrated circuit respectively coupled to the local oscillator for receiving the periodic sinusoidal output signal therefrom and respectively coupled to receive first and second controlling digital input signals (D) applied thereto, and wherein the state of the respective digital input signals (D) determines which of four phase states are present at the output of each QPSK modulator element;
- a plurality of summing devices coupled to outputs of selected modulator elements, and wherein a selected summing device provides an analog constellation output signal of the vector modulator; and
- a plurality of attenuators coupled between the selected summing devices and between an output of a selected modulator element and a selected summing device for amplitude weighting output signals from the plurality of QPSK modulator elements;

wherein the wideband vector modulator sums the outputs of the plurality of quadrature-phase-shift-key (QPSK) modulator elements under control of their two respective digital input signals (D) and the local oscillator to convert the digital input signals (D) into phase and amplitude shifted, periodic, analog signals comprising the analog constellation output signal of the vector modulator.

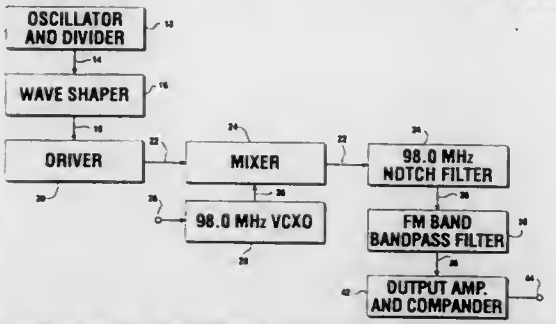
5,463,356

FM BAND MULTIPLE SIGNAL MODULATOR

James K. Palmer, 134 Fel Mar Dr., San Luis Obispo, Calif. 93405

Filed Jan. 28, 1994, Ser. No. 188,025
Int. Cl.^{6} H03C *3/00;* **H04B** *7/00;7/12*

U.S. Cl. 332—117 **29 Claims**



1. Apparatus for generating a set of carriers that are equally spaced in frequency across a band, comprising in combination:

first means for generating a waveform that has a spectrum which consists substantially of only odd integer multiples of a frequency equal to half the spacing between the carriers in the band;

second means for generating a sinusoidal signal having a frequency equal to the center frequency of the band;

a mixer having a first input terminal connected to said first means for receiving the waveform, having a second input terminal connected to said second means for receiving the sinusoidal signal, and having an output terminal, said mixer producing in response to the waveform and to the sinusoidal signal an output signal that includes the set of carriers on said output terminal.

5,463,357

WIDE-BAND MICROWAVE MODULATOR ARRANGEMENTS

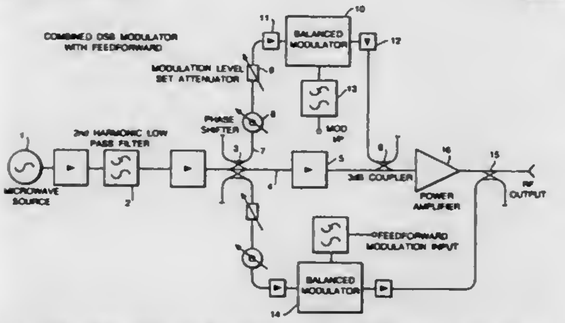
Mervyn K. Hobden, Lincoln, United Kingdom, assignor to Plessey Semiconductors Limited, United Kingdom

Filed Jun. 17, 1994, Ser. No. 261,396

Claims priority, application United Kingdom, Jul. 6, 1993, 9313981

Int. Cl.^{6} H03C *1/00;3/00*

U.S. Cl. 332—151 **5 Claims**



1. A wide-band microwave modulator arrangement for an information signal transmission system, comprising: a microwave carrier signal source; means for directing microwave carrier frequency signals from said source over first and second paths; means for adjusting the relative phase and amplitude of the microwave carrier frequency signals in said first and second paths; balanced modulator means in one of said first and second paths; wide-band modulation input means for applying wide-band information signals to said balanced modulator means in predetermined amplitude and phase; and means for combining output signals from said first and second paths such as to reinsert a signal at said microwave carrier frequency into the output of said balanced modulator means.

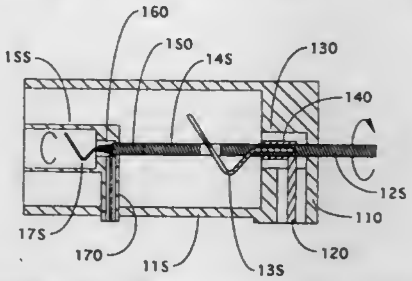
5,463,358

MULTIPLE CHANNEL MICROWAVE ROTARY POLARIZER

Daniel S. Dunn, 10612 Abingdon Chase, Orlando, Fla. 32817, and Eugene P. Augustin, 2713 Lemon Tree La., Orlando, Fla. 32809

Filed Sep. 21, 1993, Ser. No. 124,015
Int. Cl.^{6} H01Q *13/02;* **H01P** *5/12*

U.S. Cl. 333—1 **10 Claims**



1. A multiple channel microwave rotary polarizer comprising a plurality of axially spaced collinear waveguides placed one inside the other, said waveguides each containing a continuously rotatable coupling probe capable of propagating electromagnetic energy in any orientation and located in close proximity to a conducting partition means of a respective one of said waveguides, first ends of each of said coupling probes being located within a respective one of said waveguides and second ends of each of said coupling probes passing through a respective one of said conducting partition means and into stationary TEM transmission lines for coupling electromagnetic energy to external electromagnetic wave devices, said coupling probes being connected by nonconductive drive means for enabling said coupling probes to be rotated with said drive means determining the polarization of said electromagnetic energy by the rotational orientation of said coupling probes within said waveguides, said drive means comprising a drive rod oriented on a common axis with said coupling probes in each channel of said rotary polarizer, said stationary TEM transmission lines being contiguous with said conducting partition means and generally perpendicular to said drive rod.

5,463,359

IMPEDANCE MATCHING NETWORK FOR LOW OUTPUT IMPEDANCE DEVICES

Dale A. Heaton, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

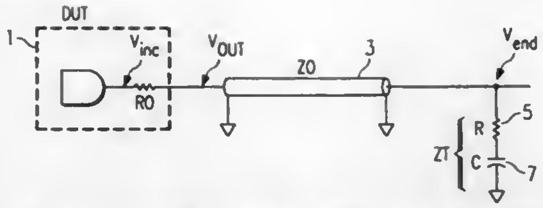
Filed Mar. 21, 1994, Ser. No. 215,561
Int. Cl.^{6} H03H *7/38*

U.S. Cl. 333—32 **2 Claims**

1. An impedance matching circuit for matching a low output impedance device to a relatively higher impedance transmission line comprising:

(a) a transmission line connected to the output of a low output impedance device, said device having a lower output impedance than the impedance of said transmission line; and

(b) a resistor-capacitor termination, where the said resistor and capacitor are connected in series, terminating said transmission line, the values of said resistor and capacitor being determined by the equations:



(i) $ZT=ZO(ZO+RO)/(ZO-RO)$, where ZT is the impedance due to the series combination of said resistor and said capacitor, ZO is the impedance in ohms of said transmission line and RO is the output impedance in ohms of said low output impedance device,

(ii) $C=(ZO * T_{delay})/(ZT * RO+1/(2 * 3.1416 * F_r * ZT)$, where T_{delay} is the delay in nanoseconds of the time for a wave to travel through said transmission line and F_r is the highest frequency component in megahertz of the wave travelling through said line and C is the capacitance of said capacitor in picofarads; and

(iii) $R=ZT-1/Cs$ where $s=2 * 3.1416 * F_r$, where R is the resistance of said resistor in ohms.

5,463,360

MICROWAVE OSCILLATOR WITH IMPROVED PHASE NOISE CHARACTERISTIC

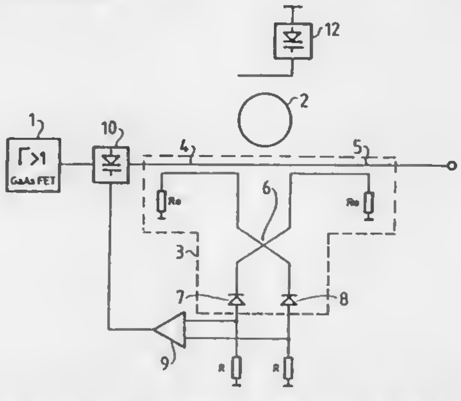
Carlo Buoli, Mirandola; Giovanni Mora, Fontanella, and Tommaso Turillo, Milan, all of, Italy, assignors to Siemens Telecomunicazioni S.p.A., Cassina dei Pecchi, Italy

Filed Feb. 6, 1995, Ser. No. 383,784

Claims priority, application Italy, Aug. 5, 1992, MI92A1938

Int. Cl.^{6} H03B *5/18*

U.S. Cl. 331—96 **8 Claims**



1. In a microwave oscillator of the type having a resonating cavity and an active device, and wherein a reflection coefficient of the active device is subjected to phase variations due to physical causes including phase noise, temperature, and supply voltage fluctuations, the improvement which comprises:

a phase shifter connected between the active device and the resonating cavity; and

a discriminator circuit connected to said phase shifter, said discriminator circuit including means for receiving waves reflected from and transmitted through the resonating cavity, and means for forming a detecting signal proportional to an oscillator frequency offset relative to a resonant frequency of said resonating cavity;

said discriminator circuit controlling said phase shifter with the detecting signal for producing phase variations substantially equal in magnitude and opposite to phase variations in the reflection coefficient of the active device.

5,463,361

SURFACE ACOUSTIC WAVE FILTER AND METHOD

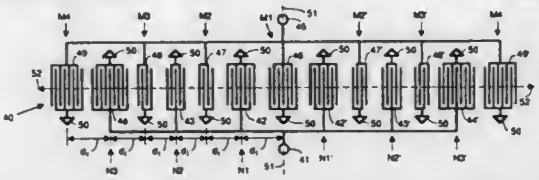
Donald E. Allen, Gilbert, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation-in-part of Ser. No. 793,925, Nov. 18, 1991, Pat. No. 5,309,126. This application Mar. 4, 1994, Ser. No. 205,472

The portion of the term of this patent subsequent to May 3, 2011, has been disclaimed.

Int. Cl.^{6} H03H *9/64*

U.S. Cl. 333—193 **20 Claims**



1. An electronic apparatus comprising a surface acoustic wave filter including a substrate comprising sixty four degree lithium niobate for propagating surface acoustic waves on which transducers are arrayed in a direction in which surface acoustic waves travel to form an array, the transducers comprising a plurality of input and a plurality of output transducers, each input and output transducer having a number of electrodes, wherein at least one of the input or output transducers located near an end of the array has a greater number of electrodes as compared to another input transducer located more centrally in the array, wherein a centerline-to-centerline separation of an adjacent pair of transducers differs from a centerline-to-centerline separation of another adjacent pair of transducers by a non-integral number of wavelengths of the surface acoustic wave, wherein a centerline of a transducer is located half way between outer edges of outer-most electrodes of that transducer.

5,463,362

TUNER CIRCUIT HAVING A SWITCHING DIODE TO CHANGE RECEIVING BANDS

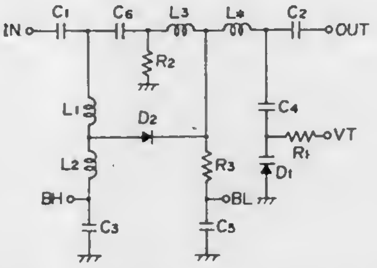
Masanori Kitaguchi, Habikino, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jul. 19, 1994, Ser. No. 277,048

Claims priority, application Japan, Aug. 19, 1993, 5-204925

Int. Cl.^{6} H03J *5/24*

U.S. Cl. 334—47 **7 Claims**



1. A tuner circuit comprising:

an input tuning circuit including a signal side and an earth side connected at a node;

a switching diode in said input tuning circuit for switching receiving bands;

a first series connection of a first low-band coil and a first high-band coil disposed on the signal side of said input tuning circuit; and

a second series connection of a second low-band coil and a second high-band coil disposed on the earth side of said input tuning circuit;

said switching diode being directly connected to both a junction of said first low-band coil and said first high-band coil on the signal side, and a junction of said second low-band coil and said second high-band coil on the earth side.

5,463,363

MAGNETIC FIELD CORRECTION DEVICE WITH SLOTTED PASSIVE SHIMS

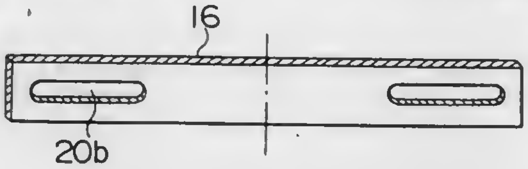
Kouichi Ogawa, Ako, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 67,118, May 26, 1993, abandoned. This application Oct. 28, 1994, Ser. No. 330,615

Claims priority, application Japan, May 29, 1992, 4-138148

Int. Cl.^{6} H01F *5/00;3/00;* **G01V** *3/00*

U.S. Cl. 335—299 **10 Claims**



1. A magnetic field correction device for enhancing a uniformity of a magnetic field generated in a uniform field region by a magnet, comprising:

a plurality of plate-shaped magnetic shim elements for generating a corrective field, said shim elements being disposed parallel to each other at a predetermined radius from a center of said uniform field region and at predetermined circumferential angles around said center, wherein one or more of said shim elements is each provided with two or more slots symmetrically formed with respect to a central plane in said shim elements, said shim elements having said two or more slots generating a first predetermined corrective field component of said corrective field generated by said plurality of shim elements in said uniform field region, wherein the first predetermined corrective field component is based on the size of said two or more slots relative to the size of said shim elements.

5,463,364

MAGNET SYSTEM FOR NMR TOMOGRAPHY

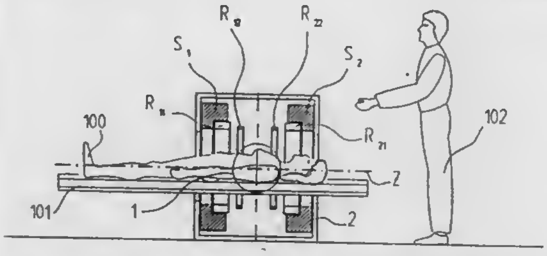
Wolfgang Müller, Karlsruhe, Germany, assignor to Bruker Analytische Messtechnik GmbH, Rheinstetten, Germany

Filed Apr. 13, 1995, Ser. No. 421,072

Claims priority, application Germany, Apr. 13, 1994, 44 12 755.3; Jun. 3, 1994, 44 19 454.4

Int. Cl.^{6} G01V *3/00;* **H01F** *7/06*

U.S. Cl. 335—299 **20 Claims**



1. A magnet system for magnetic resonance imaging of an investigational volume having a center at z=0, the system comprising:

a first magnet coil S1 coaxial to a z axis through the center and having an axial z position z_{S1} from the center and a radial separation r_{S1} from the z axis, the first magnet coil located on a first side of the investigational volume and having a first DC current;

a second magnet coil S2, coaxial to the z axis at an axial z position z_{S2} from the center and a radial separation r_{S2} from the z axis, the second magnet coil located on a second side of the investigational volume and having a second DC current, the first and second currents flowing in a common direction, and

¼;

a first ferromagnetic ring R11, partially integrated into the first magnet coil, coaxial to the z axis at an axial z position $|z_{R11}|<|z_{S1}|$ from the center and a radial separation $r_{R11}<r_{S1}$ from the z axis; and

a second ferromagnetic ring R21, partially integrated into the second magnetic coil, coaxial to the z axis at an axial z position $|z_{R21}|<|z_{S2}|$ from the center and a radial separation $r_{R21}<r_{S2}$ from the z axis, and

.85,

wherein the first and second rings are positioned and dimensioned to produce a magnetic field in the investigational volume which is homogeneous up to 8th order.

5,463,365

COIL

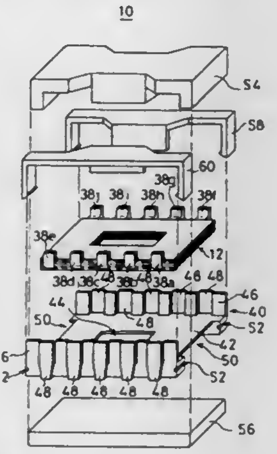
Hidetoshi Iwatani; Masato Fujino; Shinji Matsumoto; Choichiro Fujii, and Masakazu Kazama, all of Nagaokakyo, Japan, assignors to Murata Mfg. Co., Ltd., Japan

Filed Nov. 2, 1993, Ser. No. 146,783

Claims priority, application Japan, Nov. 2, 1992, 4-317840

Int. Cl.^{6} H01F *15/10;27/02;27/30*

U.S. Cl. 336—98 **20 Claims**



1. A coil comprising:

a winding part formed of plural laminated sheets each having plural winding patterns formed thereon;

a core disposed at a center of said winding patterns;

input/output electrodes formed outside of said laminated sheets forming the winding part and connected to ends of said winding patterns; and

a terminal board having a plurality of terminals and a plurality of terminal holding portions arranged on said terminal board so that each of the terminals is located between adjacent terminal holding portions, the plurality of terminals and the plurality of terminal holding portions being arranged to form a plurality of caves; wherein

at least two of said winding patterns have a different number of turns and are formed on one of said sheets around said core so as to be coaxial in the same winding direction, and

said winding part is mounted in said terminal board so that said input/output electrodes are mounted in said caves formed by the plurality of terminals and the plurality of terminal holding portions and so as to connect said input/output electrodes to said terminals.

5,463,366

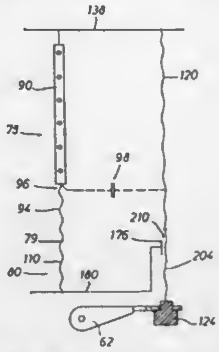
CURRENT LIMITING FUSE AND DROPOUT FUSEHOLDER

Stephen P. Hassler, Muskego, Wis.; Stephen P. Johnson, Olean, N.Y., and John Lapp, Franklin, Wis., assignors to Cooper Industries, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 946,961, Sep. 17, 1992, Pat. No. 5,274,349, and a continuation-in-part of Ser. No. 67,512, May 24, 1993, and a continuation-in-part of Ser. No. 65,439, May 24, 1993. This application Dec. 27, 1993, Ser. No. 174,594

Int. Cl.⁶ H01H *71/10;71/08;85/04;85/38*

U.S. Cl. 337—176 **21 Claims**



14. A current limiting fuseholder comprising:

a fuse body;

a first and a second terminal on said fuse body;

a primary current path between said terminals for carrying substantially all of the normal steady-state current between said first and second terminals and for initially conducting an overcurrent through said fuse body, said primary current path comprising a fusible element;

a secondary current path between said terminals, said secondary current path being electrically in parallel with said primary current path and comprising an upper conductive portion in series with a lower conductive portion, said secondary current path having substantially higher impedance than said primary current path such that said secondary current path conducts substantially no steady-state current between said terminals;

a third current path between said terminals, said third current path comprising a first spark gap between said primary and secondary current paths;

first means for diverting the overcurrent from said first current path into said secondary current path;

second means for diverting the overcurrent from said secondary current path into said third current path.

5,463,367

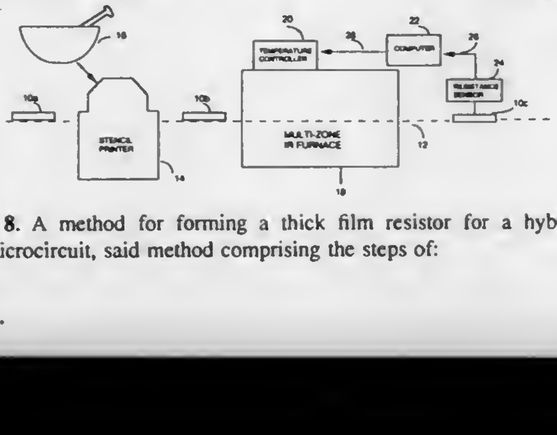
METHOD FOR FORMING THICK FILM RESISTORS AND COMPOSITIONS THEREFOR

Marion E. Ellis, Kokomo, Ind., assignor to Delco Electronics Corp., Kokomo, Ind.

Filed Oct. 14, 1993, Ser. No. 136,058

Int. Cl.⁶ H01C *1/012*

U.S. Cl. 338—308 **13 Claims**



8. A method for forming a thick film resistor for a hybrid microcircuit, said method comprising the steps of:

forming a thick film resistor paste having a composition consisting essentially of an organic vehicle, a glass frit mixture, and an electrically conductive material, said glass frit mixture being formulated such that said thick film resistor exhibits substantially predictable electrical properties which are selectively modified by altering the temperature at which said thick film resistor paste is sintered to form said thick film resistor;

depositing said thick film resistor paste on a substrate;

drying said thick film resistor paste; and

sintering said thick film resistor paste by transporting said thick film resistor paste through an infrared heating device such that said thick film resistor paste is heated to a temperature and for a duration which are sufficient to form said thick film resistor and bond said thick film resistor to said substrate, and such that said temperature affects said electrical properties of said thick film resistor.

5,463,368

METHOD OF SETTING AN INAUDIBLE ALERT MODE IN A RADIO PAGER

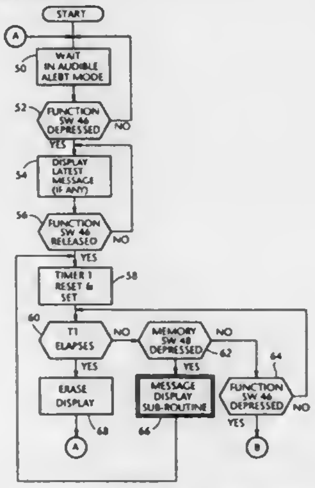
Kazuyuki Tsunoda, and Ichiro Fujisawa, both of Tokyo, Japan, assignors to NEC Corporation, and NTT Mobile Communication Network, Inc., both of Tokyo, Japan

Filed Dec. 7, 1993, Ser. No. 162,285

Claims priority, application Japan, Dec. 8, 1992, 4-327107

Int. Cl.⁶ G08B *1/00*

U.S. Cl. 340—309.15 **18 Claims**



1. A method of changing a subscriber alert mode of a radio pager having a display from an audible alert mode to an inaudible alert mode using a normally open function switch provided in said pager, said method comprising the steps of:

(a) depressing said function switch while said radio pager operates in said audible alert mode;

(b) subsequently depressing and holding said function switch;

(c) inducing a first timer to count a first predetermined time period while said function switch remains depressed;

(d) displaying, on said display, a silent time duration, for which said radio pager will operate in said inaudible alert mode, when said first timer finishes counting up said first predetermined time period;

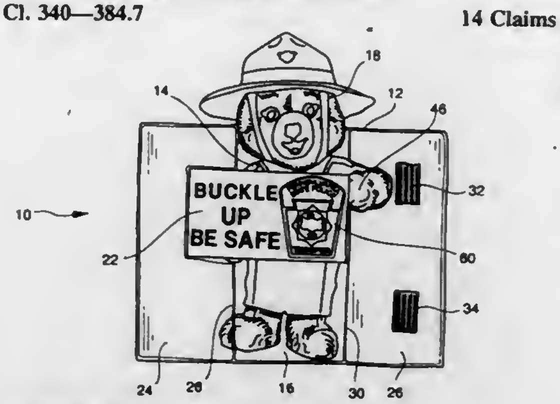
(e) inducing a second timer to count a second predetermined time period when said function switch is released; and

(f) setting said radio pager to operate in said inaudible alert mode for said silent time duration when said second timer finishes counting up to said second predetermined time period when said function switch remains released.

5,463,369
MESSAGE EMITTING DEVICE

George Lamping, 1300 Grove Ave. Ste. 103, Barrington, Ill. 60010

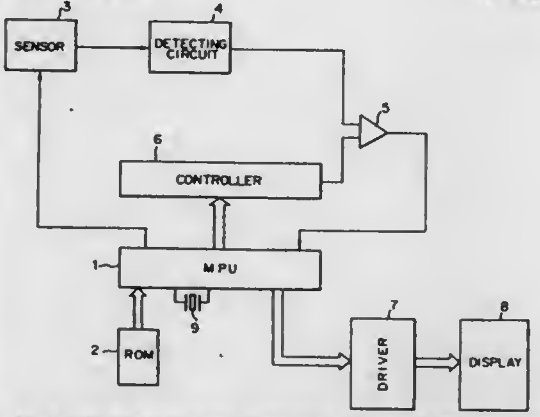
Filed Oct. 8, 1993, Ser. No. 134,211
Int. Cl.⁶ G08B *3/00;25/08*
U.S. Cl. 340—384.7 14 Claims



1. A message emitting device comprising:
a two ply flexible sheet of material shaped like and having a drawing on a front side thereof to look like a real or imaginary character;
sound emitting means mounted to said sheet between the plies and comprising an electronic circuit mounted to at least one of said plies which includes a sound synthesizer, sound producing means and a power supply coupled together for emitting a reminder message to a person wearing the device;
pressure sensitive switch means for actuating said electronic circuit; and
means for attaching said message emitting device to a belt or strap of a seat belt assembly for a human being.

5,463,370
DISPLAY DEVICE FOR A VEHICLE

Masaaki Ishikawa, and Masao Yamada, both of Tokyo, Japan, assignors to Tamapack Co., Ltd., Tokyo, Japan
Continuation of Ser. No. 490,551, May 3, 1990, abandoned. This application Feb. 16, 1993, Ser. No. 22,886
Claims priority, application Japan, Aug. 11, 1988, 63-200417; Aug. 11, 1988, 63-200418; Jan. 21, 1988, 63-265774; Jan. 28, 1988, 63-140870 U; Jan. 19, 1989, 1-10433; Mar. 2, 1989, 1-23981 U; Mar. 6, 1989, 1-53568; Apr. 18, 1989, 1-98565; Jul. 18, 1989, 63-178332
Int. Cl.⁶ B60Q *1/00*
U.S. Cl. 340—439 24 Claims

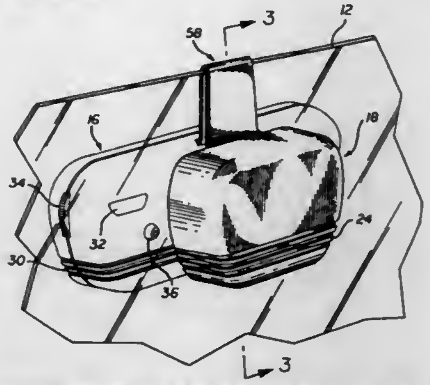


1. An accelerator operation magnitude display apparatus, comprising:
a sensor having a parallel resonance circuit formed by a coil and a capacitor, said coil being magnetically coupled to an accelerator pedal and said capacitor being connected in parallel to said coil, said sensor sensing a magnitude of operation of said accelerator pedal, including a status in which said accelerator pedal is not operated; and
means for indicating said magnitude of operation of said accelerator pedal based upon an output of said sensor.

5,463,371
WINDOW MOUNTED AUTOMOBILE SECURITY ALARM

Russell Fuller, Huntington Beach, Calif., assignor to Coyote Enterprises, Inc., Anaheim, Calif.

Filed May 13, 1994, Ser. No. 242,599
Int. Cl.⁶ B60R *25/10*
U.S. Cl. 340—426 17 Claims



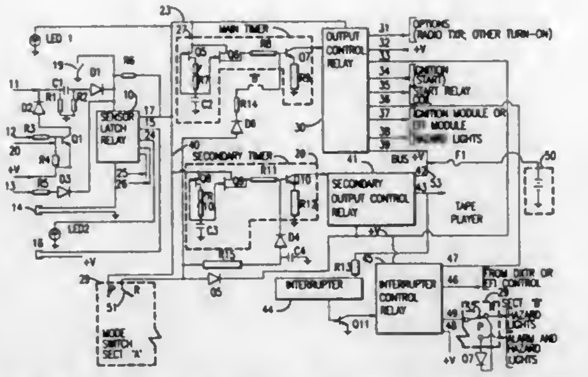
5. A portable automobile alarm apparatus removably hangable on the top edge of a side window of an automobile and comprising:
a pair of first and second elongated coextensive housings, said first housing including an actuation compartment, said second housing including an alarm compartment formed in one side with a sound grille;
a pair of spaced apart resilient bumpers mounted on the wall of said first housing adjacent said second housing;
a tamper sensor in said first housing responsive to tampering with said actuation compartment to generate a tamper signal;
an electrical circuit in said first housing including a dry cell battery supply circuit and responsive to said tamper signal to generate an alarm signal, and further responsive to a predetermined receiver signal to terminate said alarm signal;
an alarm device in said second housing and including an acoustic driver for generating an audible alarm signal for propagation through said grille;
a remote transmitter including a switch actuable to generate an RF transmitter signal;
a receiver in said first housing connected with said electrical circuit and responsive to said RF transmitter signal to generate said predetermined receiver signal;
a plurality of insulated electrical leads leading from said electrical circuit out of said first housing and into said second housing to connect with said alarm device for communication an alarm signal; and
a pair of flat U-shaped hanger springs for hanging over said top edge and carrying on their respective opposite ends said first and second housings, said springs sandwiching therebetween said plurality of electrical leads and configured to enable said housings to be spread apart for receipt over said top edge.

5,463,372
SELF-SET VEHICLE ANTI-THEFT/ANTI-HIJACKING SYSTEM WITH PARTIAL DISABLEMENT FOLLOWED BY COMPLETE SHUTDOWN

Ralph A. Mawyer, Sr., 8202 Blairton Rd., Springfield, Va. 22152-1805

Filed Oct. 27, 1993, Ser. No. 141,533
Int. Cl.⁶ B60R *25/10*
U.S. Cl. 340—428 15 Claims

1. An automatically operated vehicle anti-hijacker/anti-theft vehicle security system comprising: a sensor relay; a plurality of



sensor inputs for said sensor relay, each sensor input having the capability of momentarily energizing said sensor relay; a latching circuit for holding said sensor relay in said energized condition; primary reset means operable to interrupt said latching circuit and restore said sensor relay to its deenergized condition; a voltage bus connected to said sensor relay and energized only when said sensor relay is energized; main and secondary timers connected to said voltage bus to commence main and secondary timing cycles, respectively, upon energization of said voltage bus, said main and secondary timers controlling a main output control relay and a secondary output control relay, respectively, with said main timing cycle being longer than said secondary timing cycle, said secondary output control relay having an output circuit for energizing an intermittent control relay when said second timer actuates said secondary output control relay; intermittent means in circuit between said secondary output control relay and said intermittent control relay to cause rapid intermittent operation of said intermittent relay; and circuit means for routing the engine distributor voltage or EFI control voltage intermittently in a series path to the engine ignition and/or EFI modules through a switching output on said intermittent control relay and normally closed contacts on said main output control relay, whereby engine operation is sharply reduced in power until said main timer energizes the main control relay to open said normally closed distributor voltage contacts on said main output control relay to shut down engine operation completely by opening the circuit to the distributor or EFI modules.

5,463,373
DEVICE FOR VERIFYING DISTURBANCES IN SIGNAL TRANSMISSION IN MOTOR VEHICLES

Gerhard Widl, Grafelfing-Lochhamm, and Manfred Fichter, Königsfeld, both of, Germany, assignors to Mannesmann Kienzle GmbH, VS-Villingen, Germany

Filed Jan. 26, 1993, Ser. No. 8,916

Claims priority, application Germany, Jan. 30, 1992, 42 02 583.4

Int. Cl.^{6} B60Q *1/00*

U.S. Cl. 340—441 **2 Claims**

1. A device for verifying disturbances in signal transmission in motor vehicles, particularly the signal transmission between speed measurement and/or mileage counter devices and speed transmitters which are arranged external to said devices, which comprises:

a speed transmitter;

at least one movement transmitter;

a recording arrangement;

a measurement device associated with said at least one movement transmitter; and

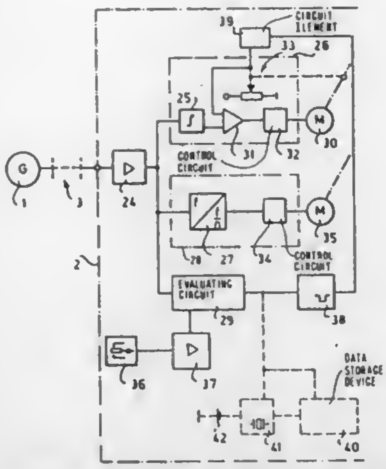
an evaluating circuit,

wherein said at least one movement transmitter senses forces which are typical of driving, and further wherein said at least one movement transmitter is arranged inside said measurement device associated therewith, and further wherein said evaluating circuit supplies a disturbance signal which controls said recording arrangement when signals of said speed transmitter do not correspond with signals of said movement transmitter, wherein said evaluating circuit supplies a disturbance signal when a pulse of said at least one movement transmitter, which is stored in said evaluating circuit, is not canceled by a pulse of said speed transmitter after a determined period of time so as to verify a disruption of signals from said speed transmitter, wherein said evalating circuit further comprises:

a flip-flop stage the set input of which is associated with said at least one movement transmitter and the reset input of which is connected with a signal input of said speed transmitter,

wherein a timer is provided which is controllable by pulses of said movement transmitter, and further wherein an output of said movement transmitter is linked with an output of said flip-flop stage via an AND operation, wherein said device further comprises:

a frequency transformer, wherein said frequency transformer is connected to said reset input of said flip-flop stage, and further wherein said frequency transformer has a pitch ratio such that pulse pauses associated therewith are shorter than a switching period of said timer at an output of said frequency transformer at a low driving speed.



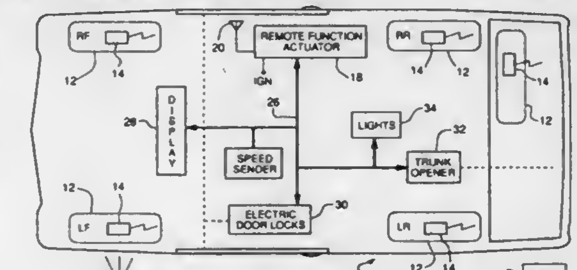
5,463,374
METHOD AND APPARATUS FOR TIRE PRESSURE MONITORING AND FOR SHARED KEYLESS ENTRY CONTROL

Victor Mendez, and Kevin J. Hawes, both of Kokomo, Mich., assignors to Delco Electronics Corporation, Kokomo, Ind.

Filed Mar. 10, 1994, Ser. No. 208,322

Int. Cl.^{6} B60C *23/00*

U.S. Cl. 340—442 **7 Claims**



1. A vehicle remote function actuator system having a single on-board radio receiver, comprising

at least one remote tire transmitter for transmitting radio frequency tire condition data;

at least one remote vehicle function transmitter for transmitting radio frequency vehicle function data;

a radio receiver mounted on the vehicle for receiving data from said remote tire transmitter and said remote vehicle function transmitter;

- a controller having a pressure detector for providing pressure condition data to said remote tire transmitter and causing said remote tire transmitter to transmit the pressure condition data to said receiver;
- the remote transmitters all having the same data format but distinctive codes for tire transmitters and vehicle function transmitters;
- a processor connected to the receiver and coupled to a display device and to a vehicle function device for responding to the transmitted data; and
- the processor being programmed to effect display of pressure condition data on said display device when a transmitted data contains a distinctive code for tire transmitters, and to activate said vehicle function device when a transmitted data contains a distinctive code for the vehicle function transmitters.

5,463,375

STATUS-REPORTING DEVICE FOR REPORTING A PREDETERMINED TEMPERATURE STATE, TEMPERATURE SENSOR SUITABLE FOR SUCH A STATUS-REPORTING DEVICE, AND PROCESS FOR THE PRODUCTION OF SUCH A TEMPERATURE SENSOR

Heinz Bauer, Edertal, Germany, assignor to Dylec Ltd., Guernsey, United Kingdom

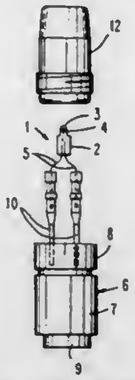
PCT No. PCT/DE91/00507, § 371 Date Dec. 21, 1992, § 102(e) Date Dec. 21, 1992, PCT Pub. No. WO91/20065, PCT Pub. Date Dec. 26, 1991

PCT Filed Jun. 19, 1991, Ser. No. 962,789

Claims priority, application Germany, Jun. 19, 1990, 40 19 542.2

Int. Cl.^{6} G01K *1/00*

U.S. Cl. 340—517 **24 Claims**



1. Status-reporting device for reporting a predetermined temperature state comprising a plurality of temperature sensors (Rs_1–Rs_7) producing output signals according to a temperature state monitored by the sensors, and an evaluating device connected to the sensors and having means for generating and transmitting an alarm signal when a preselected value the output signals is reached, said evaluating device comprising an interrogating device (IC_3) having an output (3) and a plurality of inputs (1, 2, 5, 12–15) for said sensors (Rs_1–Rs_7), means (IC_2) for connecting the sensors and the inputs (1, 2, 5, 12–15) of the interrogating device (IC_3) with the output (3) of the interrogating device (IC_3) periodically and one after the other, said means (IC_2) being coupled with said interrogating device, and a threshold switch (IC_{51}) having an output (7) being connected to said means for generating and transmitting said alarm signal and connected with the output (3) of said interrogating device, wherein each of said temperature sensors (Rs_1 –Rs_7) is a bead-heat conductor (1) provided with a tip (3) carrying a semiconductor bead (4) and arranged in a housing (6), said housing (6) having a hollow end portion (8) and a protective cap (12) connected to said hollow end portion (8) so that said tip 3 is arranged within said protective cap (12), said protective car (12) is provided with at least one opening for maintaining a flow of air around said tip (3) and said bead-heat conductor (1) in said housing (6) is embedded in a casting compound (11) in such a way that only said tip (3) projects out of said casting compound (11).

5,463,376

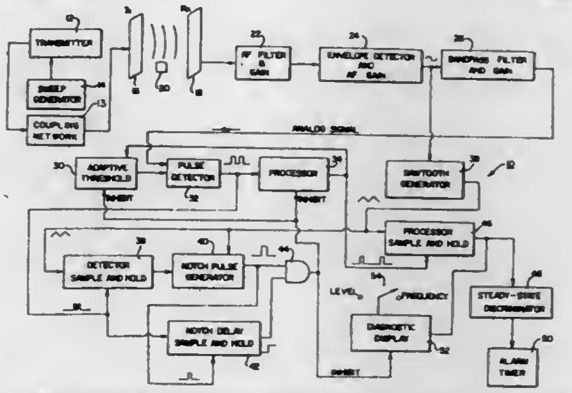
SYSTEM AND METHOD FOR SYNCHRONIZING A RECEIVER OF AN ELECTRONIC ARTICLE SURVEILLANCE SYSTEM AND A TRANSMITTER THEREOF

James F. Stoffer, Miamisburg, Ohio, assignor to Sensormatic Electronics Corporation, Deerfield Beach, Fla.

Continuation of Ser. No. 530,900, May 29, 1990, Pat. No. 5,300,922. This application Jun. 16, 1993, Ser. No. 78,457

Int. Cl.^{6} G08B *13/187*

U.S. Cl. 340—572 **13 Claims**



1. An electronic article surveillance system for detecting the presence of a tag in a surveillance zone, comprising:

- (1) a transmitter including
  - (a) first signal generating means responsive to an input signal for generating radio frequency signals at different frequencies,
  - (b) second signal generating means for generating input signals and applying the generated input signals to said first signal generating means,
  - (c) modulating means for receiving said radio frequency and providing modulated radio frequency signals and
  - (d) an antenna driven by the modulated radio frequency signals and establishing a radio frequency field in said surveillance zone; and
- (2) a receiver including
  - (a) an antenna for outputting signals corresponding to said field and the presence of a tag therein,
  - (b) processing means receiving said antenna output signals for detecting the presence of a tag in said surveillance zone, and
  - (c) circuit means receiving said antenna output signals and operable, irrespective of the presence or absence of a tag in said surveillance zone, for synchronizing said processing means with said radio frequency signals by discerning the modulation content of said antenna output signals.

5,463,377

APPARATUS FOR DETECTING THE PRESENCE OF A LIQUID

James W. Kronberg, Aiken, S.C., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

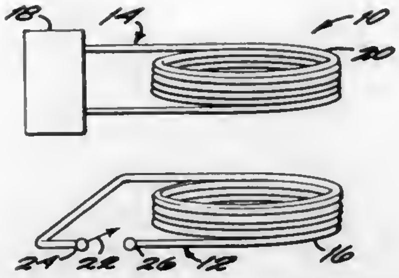
Filed Oct. 8, 1993, Ser. No. 133,299

Int. Cl.^{6} G08B *21/00*

U.S. Cl. 340—605 **18 Claims**

1. An apparatus for detecting the presence of a liquid in a region, said apparatus comprising:

- a first electrically conducting circuit;
- a second electrically conducting circuit spaced apart from said first circuit and having a first terminal and an opposing, spaced-apart second terminal;
- a switch for connecting said first and second terminals of said second circuit, said switch completing said second circuit when exposed to said liquid;
- means electrically connected to said first circuit for generating a first alternating current having a first resonant frequency in



said first circuit, said first alternating current inducing a second alternating current in said second circuit when said second circuit is placed in said region, said first circuit is brought close to said second circuit and said switch is closed, said second alternating current causing a change in said first resonant frequency of said first circuit to a second resonant frequency; and

means for indicating closure of said switch by exposure to said liquid, said indicating means indicating said change from said first resonant frequency to said second resonant frequency.

5,463,378
PROXIMITY DETECTION SYSTEM AND OSCILLATOR, AND METHOD OF USING SAME

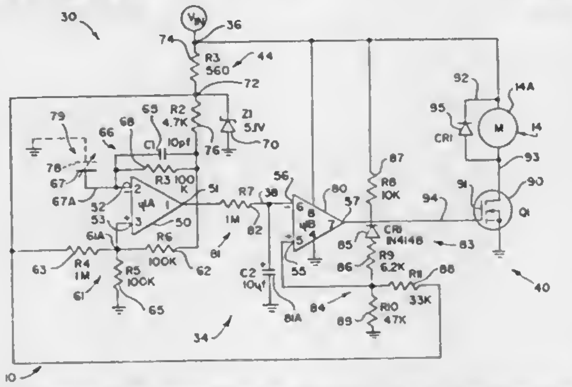
Robert F. Gibb, San Diego, Calif., assignor to Raptor, Inc., San Diego, Calif.

Continuation of Ser. No. 763,990, Sep. 23, 1991, Pat. No. 5,287,086, which is a continuation-in-part of Ser. No. 459,546, Jan. 2, 1990, abandoned. This application Dec. 14, 1993, Ser. No. 167,568

The portion of the term of this patent subsequent to Feb. 15, 2011, has been disclaimed.

Int. Cl.^{6} G08B *21/00*

U.S. Cl. 340—618 **2 Claims**



1. A method of controlling an electrical load, comprising the steps of:

(a) providing a conductive medium;

(b) disposing a sensing means in proximity with said conductive medium, said sensing means possessing a capacitance which varies from a very low capacitance value when said sensing means is in a first proximity to said conductive medium and changing to a substantially higher capacitance value when in a second proximity to said conductive medium;

(c) providing a dual mode oscillator having an input connected to said sensing means, said dual mode oscillator having an output for providing a control signal to said electrical load and functioning, in a first mode as a phase shift oscillator to generate said control signal at a first duty cycle, and in a second mode as an RC oscillator to generate said control signal at a second duty cycle;

(d) generating a control signal, at the output of said dual mode oscillator, having a first duty cycle determined by a first capacitance value of said sensing means, to thereby control said electrical load according to the first duty cycle of said control signal;

(e) varying the capacitance of said sensing means from said first capacitance value to a second capacitance value; and

(f) changing the duty cycle of said control signal from said first duty cycle to said second duty cycle in response to a change in the capacitance of said sensing means from said first capacitance value to said second capacitance value, to thereby control said electrical load according to said second duty cycle of said control signal.

5,463,379
ELECTROSTATIC DISCHARGE DETECTOR

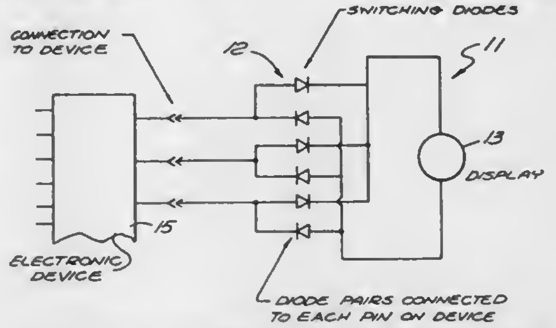
Jeffrey D. Campbell, Hawthorne, and Graham O. Gearing, Monrovia, both of Calif., assignors to Minnesota Mining and Manufacturing Co., St. Paul, Minn.

Division of Ser. No. 567,009, Aug. 13, 1990, Pat. No. 5,359,319. This application Nov. 1, 1993, Ser. No. 127,321

The portion of the term of this patent subsequent to Oct. 23, 2011, has been disclaimed.

Int. Cl.^{6} G08B *21/00*

U.S. Cl. 340—657 **21 Claims**



1. In a detector for detecting and indicating prior occurrence of an electrostatic discharge event of any polarity in an electronic component or assembly device having electrical terminals, the combination of:

a non-destructive direct reading display element which switches indication from a first state to a second state on exposure to a change in voltage level;

an electrostatic discharge sensor for sensing electrostatic discharge events of either polarity resulting from build-up of an electrostatic potential and a discharge of said electrostatic potential;

circuit means for connecting said sensor to said display element to switch said indicator from said first state to said second state;

means for maintaining display said element in said second state thereby subsequently indicating the earlier occurrence of an electrostatic discharge event; and

electrical connectors for direct connection of said sensor to the electrical terminals of the device to be monitored.

5,463,380
PAGING RECEIVER HAVING A SPEAKER AND AN LED ALTERNATIVELY DRIVEN ON RECEIVING A CALL

Masahiro Matai, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 734,660, Jul. 23, 1991, abandoned. This application Dec. 3, 1993, Ser. No. 161,091

Claims priority, application Japan, Jul. 23, 1990, 2-193139

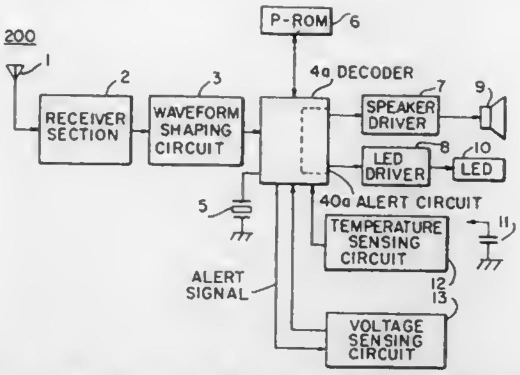
Int. Cl.^{6} G08B *5/22*

U.S. Cl. 340—825.44 **7 Claims**

1. A paging receiver comprising:

first means for receiving a radio frequency (RF) signal to produce a demodulated output;

second means for detecting data representative of a predetermined paging number out of said demodulated output to produce a detection output;



third means responsive to said detection output for generating first and second drive signals during a predetermined period of time, each of said first and second drive signals having an amplitude alternating between high and low levels, the high levels of said first and second drive signals alternating with each other during said predetermined period of time;

first alerting means responsive to said first drive signal for alerting the production of said detection output;

second alerting means responsive to said second drive signal for alerting the production of said detection output; and

battery means for feeding source power to said first, second and third means, and said first and second alerting means;

wherein said first and second alerting means substantially concurrently alert the detection of said detection output to a user of said paging receiver during said predetermined period of time;

wherein said first alerting means comprises a light emitting diode (LED) and an LED driver for driving said LED in response to said first drive signal; and

wherein said second alerting means comprises a speaker and a speaker driver for driving said speaker in response to said second drive signal;

fourth means for producing a control signal when the output voltage of said battery means is higher than a predetermined level; and

inverting means, responsive to said control signal, for inverting the polarity of one of said first and second drive signals to simultaneously drive said first and second alerting means.

2. A paging receiver comprising:

first means for receiving a radio frequency (RF) signal to produce a demodulated output;

second means for detecting data representative of a predetermined paging number. out of said demodulated output to produce a detection output;

third means responsive to said detection output for generating first and second drive signals during a predetermined period of time, each of said first and second drive signals having an amplitude alternating between high and low levels, the high levels of said first and second drive signals alternating with each other during said predetermined period of time;

first alerting means responsive to said first drive signal for alerting the production of said detection output;

second alerting means responsive to said second drive signal for alerting the production of said detection output; and

battery means for feeding source power to said first second and third means and said first and second alerting means;

wherein said first and second alerting means substantially concurrently alert the detection of said detection output to a user of said paging receiver during said predetermined period of time;

wherein said first alerting means comprises a light emitting diode (LED) and an LED driver for driving said LED in response to said first drive signal; and

wherein said second alerting means Comprises a speaker and a speaker driver for driving said speaker in response to said second drive signal;

fourth means for producing a control signal when an ambient temperature is higher than a predetermined value; and

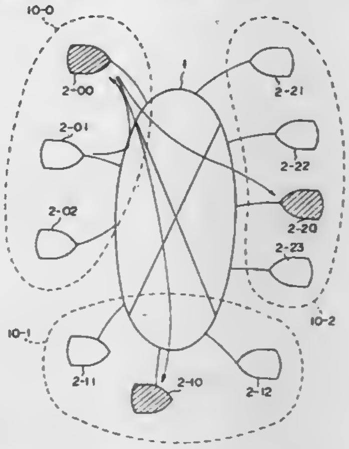
fifth means, responsive to said control signal, for inverting the polarity of one of said first and second drive signals to simultaneously drive said first and second alerting means.

5,463,381

DATABASE SYSTEM HAVING A PLURALITY OF NODES COMMUNICATING WITH EACH OTHER VIA COMMUNICATION NETWORK

Tadamitsu Ryu; Gen Kakehi, and Shigeru Aoe, all of Kanagawa, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 776,432, Oct. 17, 1991, abandoned.
This application Apr. 28, 1994, Ser. No. 234,615
Claims priority, application Japan, Jan. 17, 1990, 2-277989
Int. Cl.^{6} G06F ***13/14***
U.S. Cl. 340—825.15 **7 Claims**



1. A database system comprising:

a communication network;

a plurality of nodes coupled to said communication network, each of the nodes comprising, in respective association therewith:

a data storage device for storing data,

management means, coupled to said data storage device, for managing a status of the data stored in said data storage device,

data storage request means, coupled to said data storage device and said management means, for generating an alternative data storage device assignment request, to which data may be related, for requesting at least one other node, of said plurality of nodes, to store the related data in the data storage device respectively associated with said at least one other node, via said communication network, when a predetermined condition is satisfied, and

determining means, coupled to said management means and operative when the node, as a receiving node, receives an alternative data storage device assignment request from a requesting, other node which generates the alternative data storage device assignment request, for assigning a storage area in the associated data storage device for storing data related to the alternative data storage device assignment request by referring to the status of the data managed by said management means when the associated data storage device of said node, as a receiving node, has sufficient storage capacity to store the data related to the alterative data storage device assignment request;

said plurality of nodes being arranged in a plurality of groups and each group, of the plurality of groups, having a corresponding plurality of associated nodes and a corresponding provisional center node, said corresponding provisional center node of each said group further comprising means for managing a status of the associated data storage means of each of the nodes of its particular group;

said data storage request means of each of the other associated nodes of a group further comprising means for sending the alternative data storage device assignment request to the provisional center node of its particular group; and

the determining means of the provisional center node, of each said group, further comprising decision means for determining which node of its particular group can accept the alternative data storage device assignment request by referring to the status of the respectively associated data storage means of each of the other nodes of its particular group.

5,463,382

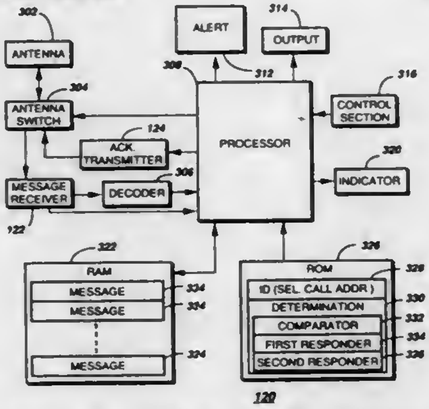
METHOD AND APPARATUS FOR CONTROLLING MESSAGE TRANSMISSIONS IN AN ACKNOWLEDGE-BACK SELECTIVE CALL COMMUNICATION SYSTEM

Dimitrios Nikas, Boynton Beach, and Zaffer S. Merchant, Lantana, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 22, 1994, Ser. No. 231,594

Int. Cl.^{6} H04Q *7/00*

U.S. Cl. 340—825.44 **14 Claims**



5. A method of controlling message transmissions in an acknowledge-back selective call communication system comprising an infrastructure and a selective call receiver that receives a plurality of messages transmitted from the infrastructure, wherein the selective call receiver stores the plurality of messages in a memory, the method comprising the steps of:

determining by the selective call receiver that insufficient space is available in the memory for storing any additional messages;

transmitting in response an unsolicited notice from the selective call receiver to the infrastructure, the notice indicating that the memory is full; and

storing, by the infrastructure in response to the unsolicited notice, an additional message intended for the selective call receiver.

5,463,383

RECEIVER FOR LOCAL CALLS WITH LOW ENERGY CONSUMPTION

Rémy Pache, St-Sulpice, Switzerland, assignor to Eta SA Fabriques d'Ebauches, Grenchen, Switzerland

Filed May 17, 1993, Ser. No. 62,255

Claims priority, application Switzerland, May 27, 1992, 01718/92

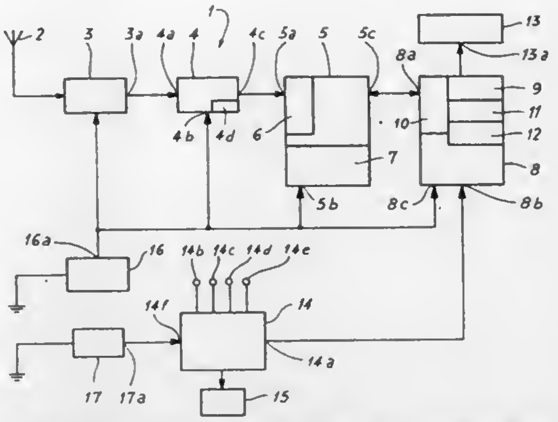
Int. Cl.^{6} G08B *5/22*

U.S. Cl. 340—825.44 **9 Claims**

1. A pager for receiving radio-broadcast message signals made up from a synchronization code word repeated at regular intervals, address code words and message information code words, said message information comprising one or several messages, said pager comprising:

a receiver for receiving and demodulating said coded signals,

a decoder for decoding said coded message signals in order to distinguish among said synchronization, address and message information code words and, when it is apparent that said pager is being addressed, extracting the message information intended therefor,



a memory arrangement connected to said decoder for storing said message information,

means connected to said memory arrangement for processing said message information so as to render it intelligible,

energization means for powering said pager,

switching means connected between said receiver and said energization means for selectively applying to said receiver a supply voltage furnished by said energization means,

means for storing said synchronization code word having a plurality of bits each in either a logically high state or a logically low state, and

control means for controlling said switching means so as to apply said supply voltage to said receiver in order to enable reception of the synchronization code word and to effect a comparison between said stored synchronization code word and the synchronization code word of said message signal each time the synchronization code word of said message is repeated to recognize said synchronization code word of said message, said control means being arranged to cut off said voltage following recognition of the synchronization code word,

said control means comprising means for effecting said comparison bit-by-bit over only a portion of the synchronization code word bits exhibiting the greatest number of state changes between successive bits and for actuating said switching means to cut off said supply voltage to said receiver as soon as the comparison indicates recognition of the synchronization code word through identity of a limited number, less than all of the bits of the synchronization code word of said message.

5,463,384

COLLISION AVOIDANCE SYSTEM FOR VEHICLES

Scott Juds, Seattle, Wash., assignor to Auto-Sense, Ltd., Denver, Colo.

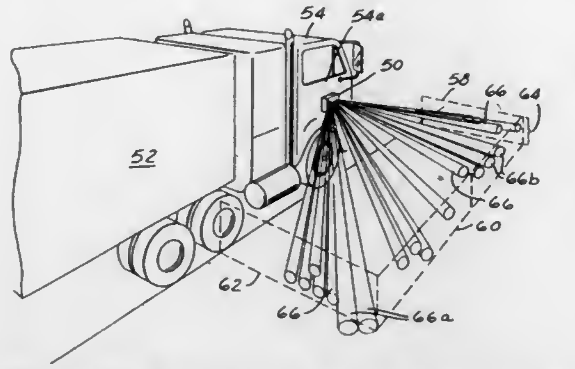
Continuation of Ser. No. 623,725, Feb. 11, 1991, abandoned. This application Mar. 9, 1994, Ser. No. 208,503

Int. Cl.^{6} G08G *1/16*

U.S. Cl. 340—903 **18 Claims**

1. Collision avoidance apparatus mounted on a host vehicle to detect the presence of an adjacent vehicle within a monitored zone, comprising a detector module mounted on the host vehicle including a plurality of discrete sensor systems, characterized by each of said sensor systems comprising

emitting means for emitting a beam of light energy into a unique portion of the monitored zone,



sensing means, having a field of view that includes only said beam, for sensing the light energy of the portion of said beam which is reflected from a surface on the adjacent vehicle that occupies said portion of the monitored zone, and for generating detection signals, and

processing means for receiving and processing the detection signals generated by the sensing means of all of said sensor systems to determine the presence of the adjacent vehicle in the monitored red zone.

5,463,385
ROADWAY SENSOR SYSTEMS

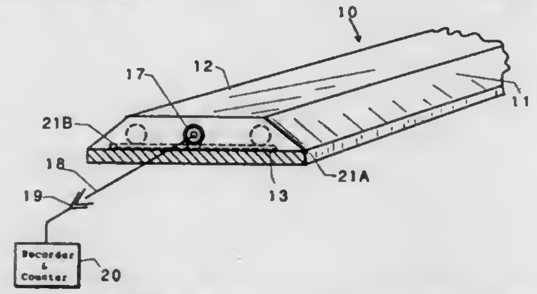
Robert M. Tyburski, Silver Spring, Md., assignor to Mitron Systems Corporation, Columbia, Md.

Continuation-in-part of Ser. No. 406,345, Sep. 13, 1989, abandoned, which is a continuation-in-part of Ser. No. 346,685, May 3, 1989, abandoned. This application May 8, 1992, Ser. No. 880,410

The portion of the term of this patent subsequent to Sep. 5, 2012, has been disclaimed.

Int. Cl.^{6} G08G *1/01*

U.S. Cl. 340—933 **16 Claims**



1. In a linear roadway vehicle sensor for sensing vehicular traffic thereover, the improvement comprising, a weighted flexible carrier member comprising an elongated flat elastomeric member having upper and lower surfaces and at least one groove in one of said surfaces, an elongated pressure sensor carried in said at least one groove, a weight recess formed in said flexible carrier member and a linear lead weight means secured within said weight recess distributed along the length of said flexible carrier and means securing said flexible carrier to said linear lead weight means, said linear lead weight means being in situ malleable by roadway traffic to conform to the roadway surface including undulations therein, said linear lead weight means having a weight per unit length which is sufficient to cause said sensor to hug the roadway and maintain said sensor on said roadway and be substantially immune to lifting from the roadway because of air flow effects and turbulence caused by vehicles.

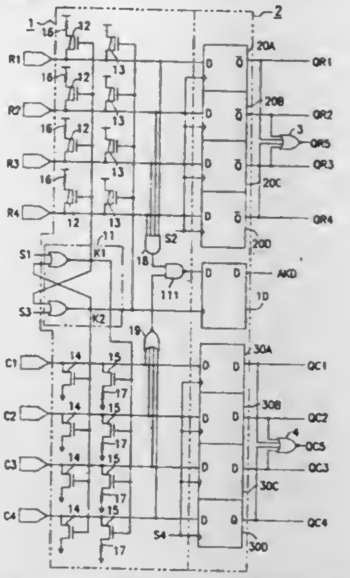
5,463,386
ELECTRICAL MATRIX KEYBOARD SCANNING CIRCUIT

Chyi-Chang Wu, Hsinchu, Taiwan, Prov. of China, assignor to United Microelectronics Corp., Hsinchu, Taiwan, Prov. of China

Filed Mar. 11, 1994, Ser. No. 212,343

Int. Cl.^{6} H03K *17/94;* H03M *11/00*

U.S. Cl. 341—26 **5 Claims**



1. A keyboard scanning circuit for an electric matrix keyboard having ordinary keys on the intersection of a first set of ports and a second set of ports, a first set of extended keys on the intersection of the first set of ports and a ground line, and a second set of extended keys on the intersection of the second set of ports and a voltage line, comprising:

a scanning circuit for scanning a status of the keys of the keyboard, including
  a first set of resistors,
  a first set of MOS transistors of a first type serially coupled with the first set of resistors between a voltage source and said first set of ports respectively,
  a second set of MOS transistors of the first type coupled between the voltage source and said first set of ports respectively,
  a second set of resistors,
  a first set of MOS transistors of a second type serially coupled with the second set of resistors between a ground line and said second set of ports respectively,
  a second set of MOS transistors of the second type coupled between the ground line and said second set of ports respectively, and
  a flip-flop for driving the transistors to alternatively set said first set of ports to a high level with a high impedance and said second set of ports to a low level with a low impedance, or said first set of ports to a high level with a low impedance and said second set of ports to a low level with a high impedance;

a memory device for storing the status of the keys and outputting corresponding signals when one of said ordinary keys is pressed, including
  a first set of latches connected to said first set of ports, having inverted outputs, and
  a second set of latches connected to said second set of ports, having non-inverted outputs;

first logic means coupled to each of said inverted outputs for indicating when one of said first set of extended keys is depressed based upon each of said inverted outputs having a common logical state; and

second logic means coupled to each of said non-inverted outputs for indicating when one of said second set of extended keys is depressed based upon each of said non-inverted outputs having a common logical state.

5,463,387

OPTICAL MOUSE AND RESIN LENS UNIT

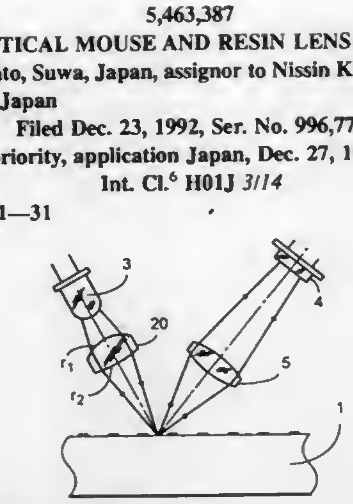
Takaaki Kato, Suwa, Japan, assignor to Nissin Kohki Co., Ltd., Nagano, Japan

Filed Dec. 23, 1992, Ser. No. 996,776

Claims priority, application Japan, Dec. 27, 1991, 3-346982

Int. Cl.^{6} H01J *3/14*

U.S. Cl. 341—31 **7 Claims**



1. An optical mouse comprising:

an illumination system for converging light emitted from a light emitting element to a light pattern of a mouse pad;

an image forming system for forming an image of the light pattern on a side of a light receiving element; and

an aspherical lens having a positive refractive index and formed with an aspherical surface in at least one surface thereof, said aspherical lens being part of at least one of said illumination system and said image forming system,

wherein said aspherical lens is a single lens for constituting said image forming system and satisfying the following optical conditions:

$2<|\beta|<15$

$0.2<r_1\cdot(n-1)/f$

$-3<K_2<0$

$0.012<NA<0.18$

where β: r_1: a radius of curvature of a surface of the lens on the mouse pad side;

n: the refractive index of lens material (for a wave length: 950 nm);

f: a focal distance;

K_2: a cone coefficient; and

NA: the number of apertures.

5,463,388

COMPUTER MOUSE OR KEYBOARD INPUT DEVICE UTILIZING CAPACITIVE SENSORS

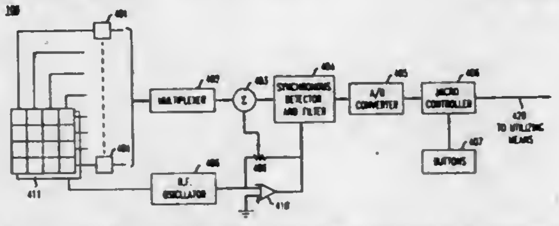
Robert A. Boie, Westfield; Laurence W. Ruedisueli, Berkeley Heights, and Eric R. Wagner, South Plainfield, all of N.J., assignors to AT&T IPM Corp., Coral Gables, Fla.

Filed Jan. 29, 1993, Ser. No. 11,040

The portion of the term of this patent subsequent to May 12, 2009, has been disclaimed.

Int. Cl.^{6} H03K *17/94*

U.S. Cl. 341—33 **10 Claims**



1. A sensor for capacitively sensing the position in a continuous range of positions of an object on a surface of an input device, which comprises:

an array of electrodes on said surface;

an insulating layer covering said electrodes;

means connected to said electrodes for measuring a capacitance value for each said electrode;

means responsive to said measuring means for comparing said capacitance values with a first preset threshold and, if at least one of said capacitance values exceeds said first preset threshold, for calculating the position of a centroid of capacitance for said array from said measured capacitance values, said first preset threshold being set at a capacitance value that is exceeded for a given electrode only when said object is close to or touching said given electrode, said centroid of capacitance being the first moment of the distribution of said capacitance values in said array and representing substantially the position of said object on said surface; and

means responsive to said calculating means and connected to utilizing means for sending said centroid of capacitance position to said utilizing means.

5,463,389

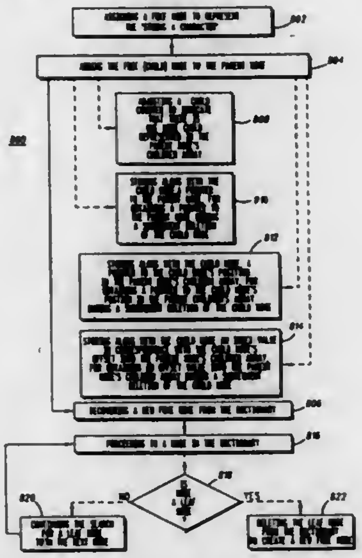
DATA COMPRESSION METHOD AND DEVICE UTILIZING CHILDREN ARRAYS

Jeffrey T. Klayman, Canton, Mass., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 24, 1993, Ser. No. 125,904

Int. Cl.^{6} H03M *7/30*

U.S. Cl. 341—51 **64 Claims**



1. A method for maximizing throughput of data character signals in a data compression encoder/decoder wherein a 'string', upon being allocated one character, is represented by a parent node that is allocated a children array with a child counter, comprising the steps of:

1A) assigning a predetermined unique value (i.e., 'character') to a received data character signal,

1B) appending the 'character' onto a 'string' to create a 'string+character',

1C) searching the parent node for a match of the 'string+character' by employing a children array indexed by the 'character', and one of: 1C1-1C2:

1C1) where a match is obtained, forming a new 'string' from the 'string+character' and recycling to step 1A,

1C2) where there is an unsuccessful match, ending the search.

5,463,390

DATA COMPRESSION APPARATUS AND METHOD

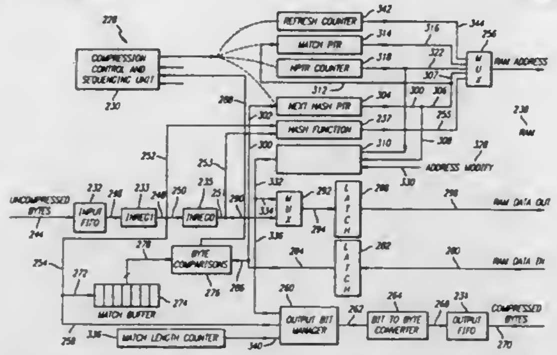
Douglas L. Whiting, South Pasadena; Glen A. George, and Glen E. Ivey, both of Pasadena, all of Calif., assignors to Stac Electronics, Inc., San Diego, Calif.

Continuation of Ser. No. 192,949, Feb. 7, 1994, abandoned, which is a continuation of Ser. No. 992,822, Dec. 16, 1992, abandoned, which is a continuation of Ser. No. 870,554, Apr. 17, 1992, abandoned, which is a continuation of Ser. No. 619,291, Nov. 27, 1990, Pat. No. 5,146,221, which is a division of Ser. No. 297,152, Jan. 13, 1989, Pat. No. 5,016,009. This application Jul. 21, 1994, Ser. No. 279,714

The portion of the term of this patent subsequent to Mar. 26, 2008, has been disclaimed.

Int. Cl.^{6} H03M *7/30*

U.S. Cl. 341—51 **22 Claims**



1. A method for converting an input data character stream into a variable length encoded data stream, each of said input data characters of said input data character stream comprising an equal number of bits, said method comprising:

a) storing said input data characters into a storage means for reference,

b) performing a search in said storage means for a longest data character string of said input data characters which matches said input data character stream,

c) encoding said matching data character string by assigning a tag indicating that said matching data character string was found, a variable length indicator of the length of said matching data character string, and a variable length pointer indicating the location within said storage means of said matching data character string, said variable length pointer represented in a form that depends upon the location within said storage means of said matching data character string;

said tag, said variable pointer and said variable length indicator together comprising a plurality of bits;

said tag, said variable pointer, and said variable length indicator encoded according to a predetermined strategy;

said predetermined strategy enabling matching strings of two data characters to be encoded so that said plurality of bits of said tag, said variable pointer, and said variable length indicator does not exceed the number of bits of two of said input data characters of said input data stream,

d) encoding a character of said input data stream by assigning a tag indicating that no matching data string was found in said storage means and said input data character;

said tag and said encoded input data character together comprising a number of bits;

said number of bits of said tag and said encoded input data character exceeding the number of bits of one of said input data characters of said input data stream.

5,463,391

Patent Not Issued For This Number

5,463,392

SIGNAL PROCESSING DEVICE

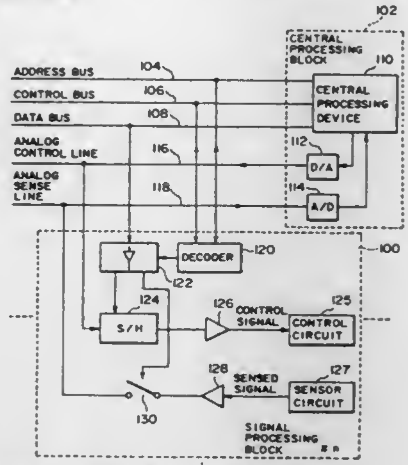
Motokazu Kashida, Musashino, and Shinichi Yamashita, Yokohama, both of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 586,305, Sep. 21, 1990, abandoned. This application Feb. 12, 1993, Ser. No. 18,917

Claims priority, application Japan, Sep. 27, 1989, 1-251288

Int. Cl.^{6} H03M *1/00*

U.S. Cl. 341—110 **23 Claims**



1. A signal processing device, comprising:

a central processing block;

plural signal processing blocks, each having a signal processing function;

analog signal lines connected in common to said central processing block and said plural signal processing blocks;

an address bus and a data bus connected in common to said central processing block and said plural signal processing blocks,

wherein said analog signal line is used for supplying said plural signal processing blocks with an analog control signal released from said central processing block, and wherein said central processing block is adapted to release, together with the analog control signal, an enable signal indicating the effectiveness of the analog control signal, and wherein each of said plural signal processing blocks includes a sample-hold circuit for sampling and holding the analog control signal in response to the enable signal.

5,463,393

METHOD AND APPARATUS FOR CORRECTING ERRORS IN AN AMPLITUDE ENCODED SIGNAL

Howard S. Havlicsek, Pittsburgh, Pa., assignor to Acutronic AG, Switzerland

Continuation of Ser. No. 802,495, Dec. 5, 1991, abandoned. This application May 13, 1994, Ser. No. 243,549

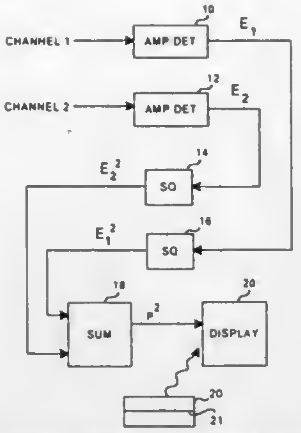
Int. Cl.^{6} H03M *1/48;1/64*

U.S. Cl. 341—115 **52 Claims**

1. A method for determining and correcting for an error in an amplitude encoded periodic signal, comprising:

receiving two such amplitude encoded periodic signals, each periodic signal having a sinusoidal amplitude component signal, the sinusoidal amplitude component signals being quadrature related;

mathematically squaring the quadrature related sinusoidal amplitude component signals to produce two mathematically squared signals;



summing the squared signals to produce a sum signal; and
utilizing the sum signal to determine if an error is present, and if so, to compensate at least one of the two sinusoidal amplitude component signals for the error.

5,463,394

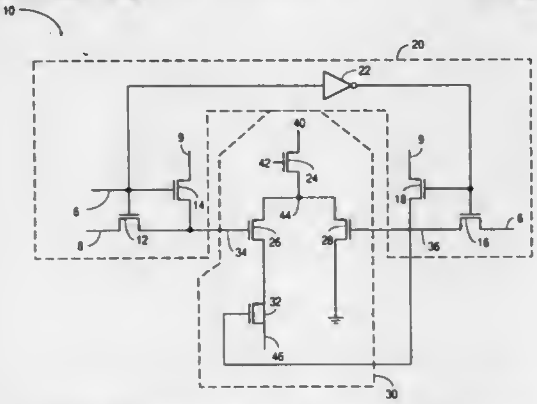
CURRENT SWITCH FOR A HIGH SPEED DAC

Young-Jen Sun, Fremont, Calif., assignor to NEC Electronics, Inc., Mountain View, Calif.

Continuation of Ser. No. 90,598, Jul. 12, 1993, Pat. No. 5,373,294. This application Jun. 15, 1994, Ser. No. 259,813

Int. Cl.⁶ H03M *1/66*

U.S. Cl. 341—136 **31 Claims**



1. A current switch for furnishing a current signal determined by logic states of an input signal having a first voltage swing, comprising:

a gating circuit responsive to the input signal to generate first and second logic signals at respective first and second outputs thereof, the first and second logic signals having voltage swings less than the voltage swing of the input logic signal, and the second logic signal being inverse to the first logic signal;

a substantially constant current source;

a first field effect transistor having a gate coupled to the first output of the gating circuit, and having a source-drain path coupled between the current source and an output node; and

a second field effect transistor having a gate coupled to the second output of the gating circuit, and having a source-drain path coupled between the current source and a reference voltage node.

5,463,395

SEMI-FLASH TYPE A/D CONVERTER EMPLOYING A CORRECTION ENCODER FOR ELIMINATING ERRORS IN THE OUTPUT SIGNALS DUE TO NOISE, AND A CORRESPONDING METHOD THEREFOR

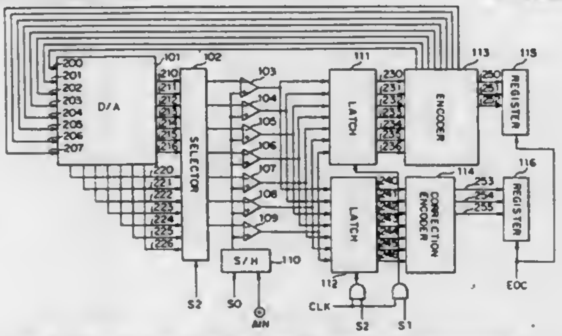
Yasunori Sawai, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Sep. 28, 1993, Ser. No. 127,373

Claims priority, application Japan, Sep. 28, 1992, 4-282401

Int. Cl.⁶ H03M *1/14*

U.S. Cl. 341—156 **6 Claims**



1. A semi-flash type analog/digital converter comprising:

digital/analog conversion means for outputting a plurality of analog signals having voltages corresponding to output data of said analog/digital converter;

a plurality of comparators, each for comparing a voltage of an associated one of said analog signals output from said digital/analog conversion means with a voltage of an analog signal to be converted into digital data;

encoding means, connected to said digital/analog conversion means and said comparators, for encoding output signals of said plurality of comparators to generate the output data of said analog/digital converter, said encoding means including correction encoding means for correcting said output signals of said plurality of comparators when said output signals are in error, and encoding said corrected signal, said correction encoding means comprising an adder circuit for adding input signals, which are based on said output signals of a predetermined number of said comparators, to provide a predetermined output signal; and

analog signal input means for receiving said analog signal to be converted into said digital data and supplying said analog signal to said plurality of comparators.

5,463,396

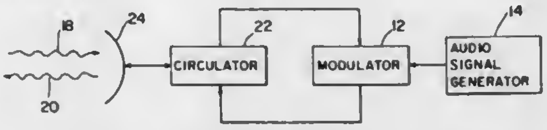
ECM FOR LONG-RANGE RADARS

Bernard L. Lewis, Oxon Hill, Md., assignor to The United States of Americas as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 16, 1980, Ser. No. 138,958

Int. Cl.⁶ G01S *7/38*

U.S. Cl. 342—15 **1 Claim**



1. A method for repeating a received, incident, long-pulse, frequency or phase-coded signal of the type that would be transmitted by a long-range radar employing pulse-compression techniques comprising the steps of:

converting a received radiation signal into a received electrical signal;

generating at least one fixed-frequency signal;

modulating said received electrical signal by said generated fixed-frequency signal in order to obtain at least a sum and differences signal therefrom representing frequency offset signals, which when received by a pulse compression radar will be compressed early or late thereby causing false targets to be produced;

significantly enlarging the scattering cross-section section σ these sum and difference false target signals in order to simulate at least two large targets and converting said sum and difference false target signals into a radiation signal; and

launching a system capable of performing this method on a balloon.

5,463,397

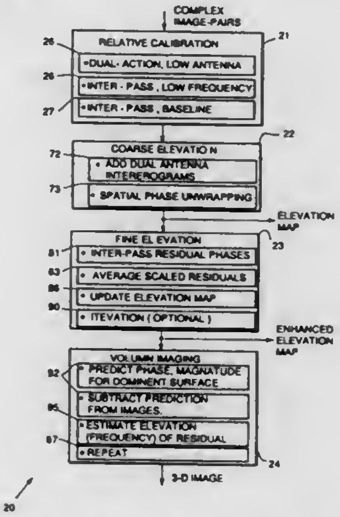
HYPER-PRECISION SAR INTERFEROMETRY USING A DUAL-ANTENNA MULTI-PASS SAR SYSTEM

Robert T. Frankot, Van Nuys, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Oct. 25, 1993, Ser. No. 140,946

Int. Cl.^{6} G01S *13/90*

U.S. Cl. 342—25 **10 Claims**



COMPLEX IMAGE-PAIRS
21
RELATIVE CALIBRATION
26
•DUAL-ACTION, LOW ANTENNA
26
•INTER-PASS, LOW FREQUENCY
27
•INTER-PASS, BASELINE
22
COARSE ELEVATION
72
• ADD DUAL ANTENNA INTEREROGRAMS
73
• SPATIAL PHASE UNWRAPPING
ELEVATION MAP
FINE ELEVATION
23
81
• INTER-PASS RESIDUAL PHASES
83
• AVERAGE SCALED RESIDUALS
86
• UPDATE ELEVATION MAP
90
• ITEVATION (OPTIONAL)
ENHANCED ELEVATION MAP
VOLUMN IMAGING
92
• PREDICT PHASE, MAGNATUDE FOR DOMINENT SURFACE
• SUBTRACT PREDICTION FROM IMAGES.
95
• ESTIMATE ELEVATION (FREQUENCY) OF RESIDUAL
97
• REPEAT
24
3-D IMAGE
20

1. An interferometric synthetic aperture radar system for producing a highly precise three dimensional SAR image, said system comprising:

a synthetic aperture radar system having two antennas separated by a predetermined separation distance which generates data comprising complex image pairs representative of an image scene; and

processing means for processing the data comprising the complex image pairs, for calibrating the data comprising the complex image pairs to provide calibrated data, for processing the calibrated data to generate a low ambiguity SAR elevation map, for processing the low ambiguity SAR elevation map to provide an enhanced SAR elevation map, and for processing the enhanced SAR elevation map to produce a precise three dimensional SAR image, said processing means comprising:

(i) means for processing the data using low frequency phase error processing to remove low frequency phase inconsistencies between same-pass image pairs;

(ii) means for processing the data using inter-pass, low frequency processing to remove low frequency phase inconsistencies between inter-pass image pairs, and

(iii) means for processing the data using inter-pass baseline processing to provide a coarse estimate of the elevation angel separation between each pass.

5,463,398

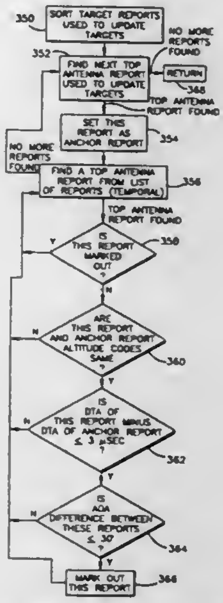
METHOD AND APPARATUS FOR MULTIPLE REPLY REJECTION WHEN DECODING TRANSPONDER REPLAY SIGNALS

Eddie L. Young, Columbus, Ohio, assignor to B. F. Goodrich FlightSystems, Inc., Columbus, Ohio

Filed Nov. 16, 1993, Ser. No. 153,724

Int. Cl.^{6} G01S *13/87;13/76*

U.S. Cl. 342—46 **22 Claims**



350
SORT TARGET REPORTS USED TO UPDATE TARGETS
NO MORE REPORTS FOUND
352
FIND NEXT TOP ANTENNA REPORT USED TO UPDATE TARGETS
RETURN
368
TOP ANTENNA REPORT FOUND
SET THIS REPORT AS ANCHOR REPORT
354
NO MORE REPORTS FOUND
FIND A TOP ANTENNA REPORT FROM LIST OF REPORTS (TEMPORAL)
356
TOP ANTENNA REPORT FOUND
IS THIS REPORT MARKED OUT ?
358
Y
N
ARE THIS REPORT AND ANCHOR REPORT ALTITUDE CODES SAME ?
360
N
Y
IS DTA OF THIS REPORT MINUS DTA OF ANCHOR REPORT ≤ 3 μSEC ?
362
N
Y
IS AOA DIFFERENCE BETWEEN THESE REPORTS ≤ 30°?
364
N
Y
MARK OUT THIS REPORT
366

1. A method for rejecting multiple reply signals received from a target transponder within a selectable time period, comprising the steps of:

a. determining an angle of arrival (AOA) value for each reply signal using an antenna that produces, in response to said reply signals, phase related signals corresponding to target bearing;

b. determining an altitude code associated with each reply signal;

c. determining a differential time of arrival (DTA) value for each reply signal based on the difference between the time the reply signal was received and a predetermined reference time;

d. producing, for each reply signal, a target report that includes said altitude code, AOA and DTA values; and

e. comparing said altitude code, AOA and DTA data of an anchor target report with other target reports for matching, within defined limits, corresponding data of each other target report and said anchor target report to identify matched target reports and marking out such matched target reports as multiple replies from the target corresponding to the anchor target report.

5,463,399

MTI USING A POLYPHASE CODE

Frank F. Kretschmer, Jr., Laurel, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 28, 1983, Ser. No. 463,221

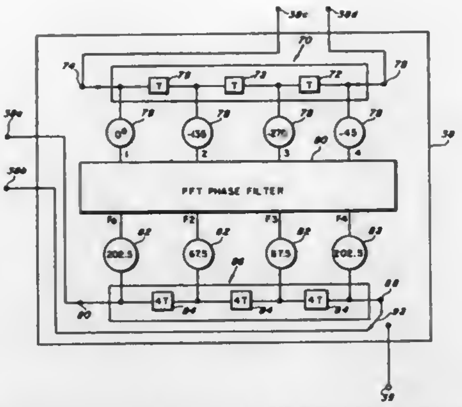
Int. Cl.^{6} G01S *13/28;13/524*

U.S. Cl. 342—132 **9 Claims**

1. An MTI for detecting moving targets in a clutter background comprising:

means for generating a palindromic polyphase coded upswept expanded signal and a palindromic polyphase coded downswept expanded signal;

means for alternately transmitting said upswept and downswept signals;



- means for receiving the upswept and downswept echos of said transmitted upswept and downswept signals reflected from moving and non-moving targets;
- means for switching said upswept echos into the input of a first matched filter for compressing the echos into a first compressed pulse;
- means for switching said downswept echos into a second matched filter for compressing the echos into a second compressed pulse where said polyphase expanded first and second compressed pulses are of the type with real autocorrelation sidelobes; and
- means for subtracting said first and second compressed pulses to cancel echos from non-moving targets and to provide an MTI output signal encoding the range of moving targets.

5,463,400

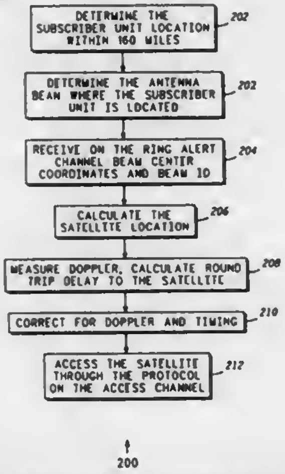
METHOD AND APPARATUS FOR SYNCHRONIZING TO A MULTI-BEAM SATELLITE TDMA COMMUNICATION SYSTEM

Daniel R. Tayloe, Phoenix, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 30, 1994, Ser. No. 269,273

Int. Cl.^{6} H04B *7/185*

U.S. Cl. 342—352 **20 Claims**


DETERMINE THE SUBSCRIBER UNIT LOCATION WITHIN 160 MILES
202
DETERMINE THE ANTENNA BEAM WHERE THE SUBSCRIBER UNIT IS LOCATED
202
RECEIVE ON THE RING ALERT CHANNEL BEAM CENTER COORDINATES AND BEAM ID
204
CALCULATE THE SATELLITE LOCATION
206
MEASURE DOPPLER, CALCULATE ROUND TRIP DELAY TO THE SATELLITE
208
CORRECT FOR DOPPLER AND TIMING
210
ACCESS THE SATELLITE THROUGH THE PROTOCOL ON THE ACCESS CHANNEL
212
200

1. A method for accessing a communication system by a subscriber unit, said communication system comprising at least one communication station that projects a plurality of antenna beams on the surface of the Earth and is moving with respect to the surface of the Earth, said method comprising the steps of:

- (a) determining, by said subscriber unit using said one communication station, a first location of said subscriber unit;
- (b) determining one of said antenna beams in which said subscriber unit is located;
- (c) receiving from said one communication station, a beam center identification indicating a center of a ground projection of said one antenna beam;
- (d) determining a second location of said one communication station using said beam center identification;
- (e) calculating a propagation time to said one communication station based on the difference between said first and second locations; and
- (f) transmitting an acquisition request to said one communication station at a time based on said propagation time, wherein said acquisition request arrives at said one communication station within a timing window.

5,463,401

METHOD AND ARRANGEMENT OF POINTING AN ANTENNA BEAM TO A STATIONARY SATELLITE

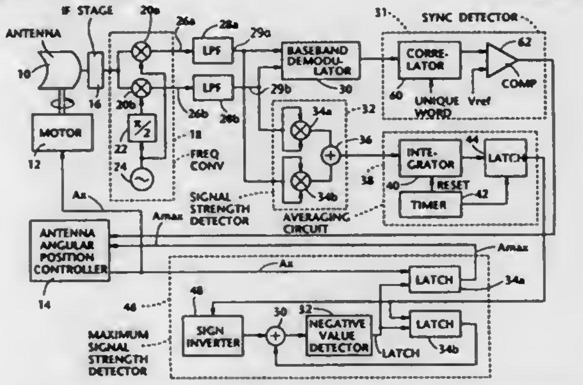
Motoya Iwasaki, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Dec. 14, 1992, Ser. No. 990,673

Claims priority, application Japan, Dec. 12, 1991, 3-350653

Int. Cl.^{6} H01Q *3/00*

U.S. Cl. 342—359 **5 Claims**



1. A method of implementing a procedure for initially pointing an antenna beam of a directional antenna, mounted on a mobile unit, toward a stationary satellite, said antenna having a fan shaped pattern which makes an elevation searching for a satellite unnecessary, said method comprising the steps of:

- (a) rotating said directional antenna through one complete revolution in azimuth;
- (b) detecting a maximum strength of a received signal during said one complete revolution and acquiring an identification of an antenna angular position during said one complete revolution at which said maximum receive signal strength has been detected;
- (c) rotating said directional antenna to said antenna angular position identified in step (b);
- (d) determining whether said directional antenna is correctly pointed toward said stationary satellite by detecting a synchronization of a demodulated received signal on the basis of a correlation between a unique word demodulated from said received signal and a unique word stored in said mobile unit, said determination being made responsive to a signal received via said directional antenna at said antenna angular position;
- (e) terminating the antenna beam pointing procedure in response to a detection that said directional antenna is correctly pointed toward said stationary satellite at step (d); and
- (f) repeating steps (a) to (d) in response to a detection that said directional antenna is not pointed toward said stationary satellite at step (d).

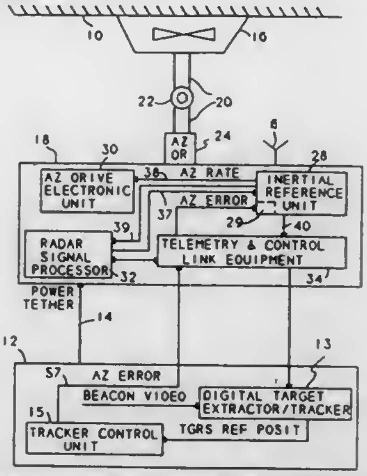
5,463,402

MOTION MEASUREMENT SYSTEM AND METHOD FOR AIRBORNE PLATFORM

Craig D. Walrath, Catonsville, and James V. Arnts, Severna Park, both of Md., assignors to Thermo King Corporation, Minneapolis, Minn.

Filed Mar. 30, 1993, Ser. No. 40,241
Int. Cl.^{6} H01Q *3/00*

U.S. Cl. 342—359 **10 Claims**



1. A motion measurement system for an airborne platform tethered to a ground station, and an antenna mounted on the airborne platform for radiating a rotating beam and collecting return energy from the radiated beam, said system comprising:

at least one rate sensor mounted on the airborne platform in a fixed position relative to the rotating beam for generating signals corresponding to the rate of rotation of the radiated beam;

means positioned on a ground based platform responsive to a geographic azimuth bearing angle signal for generating azimuth alignment error signals

means for receiving on the airborne platform the azimuth alignment error signals corresponding to an azimuth alignment error of the rotating beam; and

means for processing the rate of rotation signals and the azimuth alignment error signals to generate the bearing angle signal corresponding to a geographic azimuth bearing of the beam.

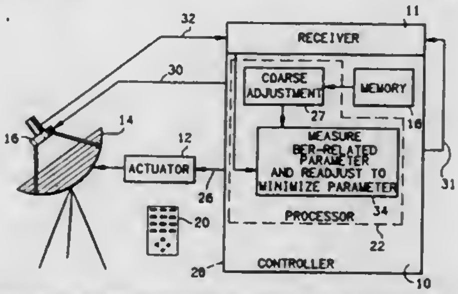
5,463,403

AUTOMATIC ADJUSTMENT OF RECEIVER APPARATUS BASED ON CHANNEL-BIT-ERROR-RATE-AFFECTED PARAMETER MEASUREMENT

Gordon K. Walker, Escondido, and Paul Moroney, Olivenhain, both of Calif., assignors to General Instrument Corporation, Chicago, Ill.

Continuation of Ser. No. 911,980, Jul. 10, 1992, Pat. No. 5,287,115. This application Jan. 12, 1994, Ser. No. 180,574
Int. Cl.^{6} H01Q *3/00*

U.S. Cl. 342—359 **24 Claims**



1. A system for automatically adjusting an apparatus for receiving a broadcast communication signal that is forward-error-correction coded, comprising

means for processing a received forward-error-correction-coded signal to measure a channel-bit-error-rate-affected parameter for the received signal; and

means for adjusting the apparatus from an initial setting in response to said measurement until the measured parameter is minimized;

wherein the adjusting means are adapted for readjusting the apparatus within a given range of settings defined by boundaries on both sides of the initial setting, for extending said given range beyond one of said boundaries when the measured parameter is minimized at said one boundary and for readjusting said apparatus within said extended given range; and

wherein the processing means includes

a Viterbi decoder for processing the forward-error-correction code of the received signal when the received signal has been forward error corrected with a convolutional code, to compute path metrics affected by the bit-error rate of the received signal and for normalizing said computed path metrics, and

means for counting said normalizations over fixed intervals to measure a path metric normalization rate as the measured parameter.

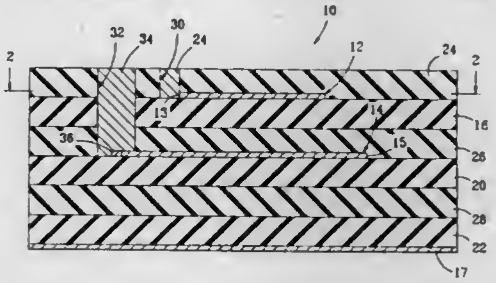
5,463,404

TUNED MICROSTRIP ANTENNA AND METHOD FOR TUNING

Angela M. Wall, Largo, Fla., assignor to E-Systems, Inc., Dallas, Tex.

Filed Sep. 30, 1994, Ser. No. 316,646
Int. Cl.^{6} H01Q *1/38*

U.S. Cl. 343—700 MS **15 Claims**



6. A microstrip antenna tuned to a desired resonance frequency comprising:

a first layer of dielectric material having top and bottom surfaces;

a first antenna element formed from a layer of metal on the top surface and having a predetermined antenna pattern and resonance frequency;

a second layer of dielectric material overlaying the first antenna element and bonded to the first layer;

a bore hole formed by drilling downwardly from the top surface of the second layer and through the metal layer for removing a portion of the predetermined antenna pattern and raising a resonance frequency of the antenna element; and

a non-conductive dielectric material filling the bore hole.

5,463,405

CELLULAR TELEPHONE COUPLING NETWORK

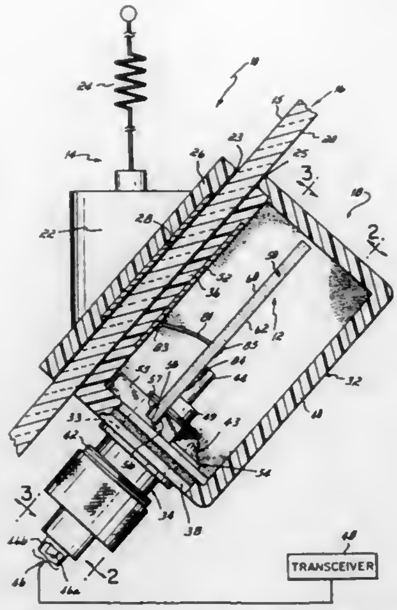
Duixian Liu, Dayton, and Glenn L. Cota, Piqua, both of Ohio, assignors to Valor Enterprises, Inc., Piqua, Ohio

Filed May 20, 1994, Ser. No. 246,734
Int. Cl.^{6} H01Q *1/32*

U.S. Cl. 343—715 **43 Claims**

1. A cellular telephone antenna to transceiver coupling network comprising:

a connector for coupling to a cellular transceiver, the connector having a center conductor and an outer shell;



- a dielectric substrate having first and second opposing face surfaces;
- a pair of tuning stubs, each including an elongated first conductive strip on the first face surface and an elongated second conductive strip on the second face surface in confronting relationship with the first strip of the stub, the confronting strips being of approximately equal width along a major portion of their lengths, one strip of each tuning stub being coupled to the center conductor of the connector and another strip of each tuning stub being coupled to the outer shell of the connector;
- a conductive member associated with each of the stubs and being selectively attached at a location on the stub to electrically connect the confronting strips of the stub and tune the stub; and
- a conductive element electrically connected to one of the tuning stubs for coupling the coupling network to a cellular antenna;

whereby to provide electrical coupling between said cellular antenna and said cellular transceiver.

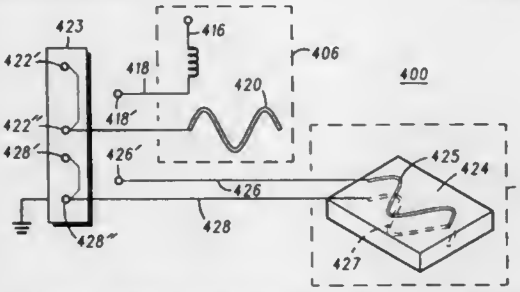
5,463,406

DIVERSITY ANTENNA STRUCTURE HAVING CLOSELY-POSITIONED ANTENNAS

Louis J. Vannatta, Crystal Lake, and James P. Phillips, Lake in the Hills, both of Ill., assignors to Motorola, Schaumburg, Ill.

Filed Dec. 22, 1992, Ser. No. 995,113
Int. Cl.⁶ H01Q *21/00*

U.S. Cl. 343—725 **19 Claims**



1. A diversity antenna structure for a radio having radio circuitry operative in a radio communication system, said diversity antenna structure comprising:

- a first antenna formed of a first conductive portion and a second conductive portion wherein the second conductive portion of said first antenna forms a first ground plane portion; and
- a second antenna formed of a first conductive portion and a second conductive portion wherein the second conductive portion of said second antenna forms a second ground plane portion and wherein the second ground plane portion formed of the second conductive portion of the second antenna is maintained in isolation from the first ground plane portion formed of the second conductive portion of the first antenna so as to cause radio frequency isolation when a difference between operating frequencies of the first antenna and the second antenna is at least zero.

5,463,407

DUAL MODE/DUAL BAND FEED STRUCTURES

Laurice J. West, Ventura, and Edward E. Gabrelian, Granada Hills, both of Calif., assignors to California Amplifier, Inc., Camarillo, Calif.

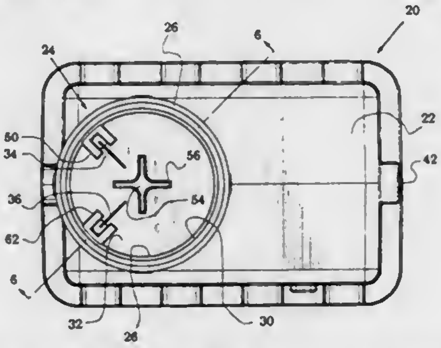
PCT No. PCT/US93/01054, § 371 Date Oct. 13, 1993, § 102(e) Date Oct. 13, 1993, PCT Pub. No. WO93/16502, PCT Pub. Date Aug. 19, 1993

Continuation-in-part of Ser. No. 831,900, Feb. 6, 1992, Pat. No. 5,216,432. This PCT application Feb. 5, 1993, Ser. No. 133,168

The portion of the term of this patent subsequent to Jun. 1, 2010, has been disclaimed.

Int. Cl.⁶ H01Q *13/00*

U.S. Cl. 343—786 **40 Claims**



1. A dual mode feed structure for reception of orthogonal linearly polarized signals, comprising:

- a feed horn defining a microwave cavity along a longitudinal axis, said cavity having a side wall and terminated at one end by a back wall and open at an opposed end for entrance of said orthogonal linearly polarized signals;
- a pair of probes projecting into said cavity and spaced from said axis along a different one of two orthogonal planes through said axis for receiving a different one of said signals; and
- an isolation member projecting into said cavity and substantially centered on said axis, said isolation member including a radial arm extending into the quadrant, defined by said orthogonal planes, that is located between said probes.

5,463,408

LIQUID-CRYSTAL DISPLAY

Masao Mio, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 11,033, Jan. 29, 1993, abandoned. This application Jun. 13, 1994, Ser. No. 258,904

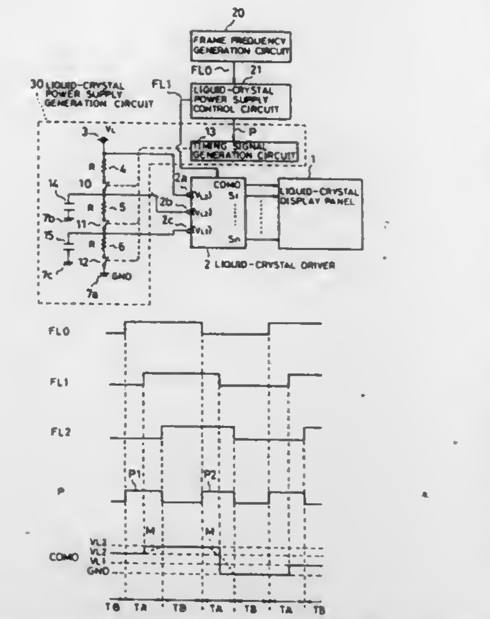
Claims priority, application Japan, Feb. 18, 1992, 4-069013

Int. Cl.⁶ G09G *3/18*

U.S. Cl. 345—52 **6 Claims**

4. A system for achieving reduced power consumption in operation of a liquid-crystal display comprising:

- a liquid-crystal driver, coupled to receive a frame frequency signal and plurality of input voltage level signals, for generating a plurality of control signals having magnitudes equal to selected voltage level signals to drive a liquid-crystal display,


20
FRAME FREQUENCY GENERATION CIRCUIT
FL0
21
LIQUID-CRYSTAL POWER SUPPLY CONTROL CIRCUIT
30 LIQUID-CRYSTAL POWER SUPPLY GENERATION CIRCUIT
FL1
13
P
TIMING SIGNAL GENERATION CIRCUIT
1
3
VL
R
4
5
6
10
11
12
14
15
7b
7c
7a
GND
2a
2b
2c
COMO
S1
Sn
LIQUID-CRYSTAL DISPLAY PANEL
2 LIQUID-CRYSTAL DRIVER
FL0
FL1
FL2
P
P1
P2
M
COMO
VL3
VL2
VL1
GND
TB
TA
TB
TA
TB
TA
TB

with said driver for changing the magnitudes of said control signals at transition times derived from said frame frequency signal;

a timer circuit that outputs an interval control signal at preset intervals that define a first time interval that includes the transition times when the magnitudes of said control signals are changed and second time intervals when the magnitudes of said control signals do not change; and

a liquid-crystal power supply generation circuit, having inputs coupled to receive power and ground voltage levels, and said interval control signal, and having outputs to provide said voltage level signals to said liquid crystal driver, and including a plurality of capacitors coupled between said liquid-crystal driver and said ground voltage level, for driving said voltage level signals from said received power and ground signals and for charging said capacitors to said voltage level signals when said interval control signal defines said second time interval and for driving said control signals from said charged capacitors when said interval control signal defines said first time interval.

5,463,409

TRACKER BALLS

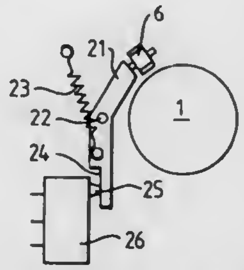
David P. Gilbert, Lincoln, United Kingdom, assignor to Plessey Semiconductors Limited, United Kingdom

Filed May 2, 1994, Ser. No. 236,965

Claims priority, application United Kingdom, Jun. 21, 1993, 9312738

Int. Cl.^{6} G09G *3/02*

U.S. Cl. 345—167 **4 Claims**



1. A trackerball arrangement, comprising: a housing; a ball rotatably mounted with respect to the housing; a plurality of supports arranged to locate the ball in a predetermined operable position relative to the housing, at least one of the supports being mounted on a pivotable arm for movement towards and away from the other supports; spring means arranged to act upon said pivotable arm for urging said one of the supports with a force towards the other supports; and stop means for limiting the movement of said one of the supports towards the other supports; said force exerted by said spring means being overcome in response to pressure which exceeds a threshold value and which is applied to the supports by way of the ball, thereby causing movement of said one of the supports away from the other supports and allowing lateral movement of the ball.

5,463,410

IMAGE RECORDING APPARATUS USING OPTICAL BEAM

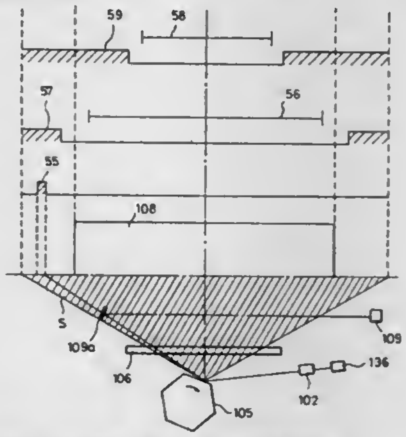
Seiji Uchiyama, Tokyo; Akio Noguchi, Yokohama; Yukihide Ushio; Shinpei Matsuo, both of Tokyo; Youji Serizawa; Makoto Takeuchi, both of Yokohama; Kazurou Yamada, Tokyo, and Junichi Kato, Yokohama, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 633,134, Dec. 24, 1990, abandoned. This application Jun. 1, 1994, Ser. No. 252,625

Claims priority, application Japan, Dec. 27, 1989, 1-339406; Mar. 1, 1990, 2-51359; Mar. 23, 1990, 2-74757

Int. Cl.^{6} G01D *9/42*

U.S. Cl. 347—133 **22 Claims**



1. An image recording apparatus comprising:

a light beam generator for generating a light beam modulated by an image signal;

a light beam deflector for cyclically scanning a surface of a light-sensitive body with the light beam generated by said light beam generator;

a light beam detector for detecting the light beam outside an area for image formation effected by the modulated light beam; and

a controller for forcibly actuating said light beam generator in each scanning cycle during an unblanking period corresponding to an area outside the area for image formation to enable said light beam detector to detect the light beam;

wherein said controller selectively shifts start times for the unblanking period with respect to a scanning time in which the light beam generated by said light beam generator is modulated by the image signal and another scanning time which corresponds to intervals between images and in which the light beam is not modulated by the image signal.

5,463,411

ELECTROTHERMAL INK PRINT HEAD

Wolfgang Wehl, Berlin, Germany, assignor to Eastman Kodak Company, Rochester, N.Y.

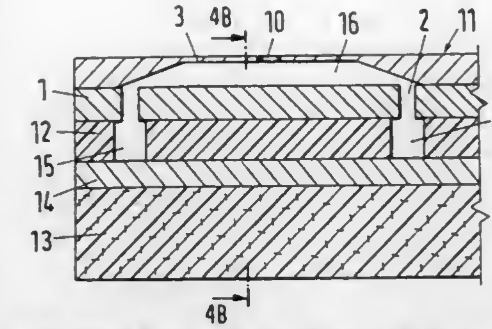
Filed Apr. 28, 1993, Ser. No. 54,715

Claims priority, application Germany, Apr. 28, 1992, 42 14 556.2

Int. Cl.^{6} B41J *2/05;2/175*

U.S. Cl. 347—65 **6 Claims**

1. An electrothermal ink print head, comprising:



a chip integrally including an ink discharge opening through which droplets of ink are operatively discharged in a discharge direction onto a print medium upon which an image is to be impressed, an elongated ink duct for delivering ink to said discharge opening, and a heating element disposed on said chip remote from said ink duct and operable for electrothermally heating ink in said ink duct for forming an electrothermally-produced steam bubble that propagates in a direction opposite said discharge direction;

a cover plate having at least one elongate opening defined therethrough, said at least one elongate opening being perpendicular to said ink duct and located to correspond with a respective end of said ink duct; and

an ink supply vessel for storing a supply of ink and including a supply conduit located to correspond with said at least one elongate opening for delivering ink from said vessel to said chip ink duct via said at least one elongate opening;

said chip, cover plate and vessel being connected together so that said cover plate is sandwiched between said chip and said ink supply vessel and so that said at least one elongate opening is aligned with said supply conduit so as to define a continuous flow path formed of said supply circuit, said at least one opening and said ink duct such that ink is operatively delivered from said supply vessel supply conduit to said chip ink duct through said at least one cover plate opening, said at least one elongate opening being of a width less than the width of said supply conduit to thereby reduce recoil effects on ink within said ink duct created by the pressure wave.

5,463,412

LIQUID JET RECORDING HEAD WITH MULTIPLE LIQUID CHAMBERS

Hiroto Matsuda, Ebina, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 41,336, Apr. 1, 1993, abandoned, which is a continuation of Ser. No. 794,677, Nov. 18, 1991, abandoned, which is a continuation of Ser. No. 453,808, Dec. 20, 1989, abandoned, which is a continuation of Ser. No. 361,772, May 30, 1989, Pat. No. 4,914,736, which is a continuation of Ser. No. 82,917, Aug. 10, 1987, abandoned, which is a continuation of Ser. No. 747,564, Jun. 21, 1985, abandoned.

This application Jan. 12, 1994, Ser. No. 180,462

Claims priority, application Japan, Jul. 5, 1984, 59-139421

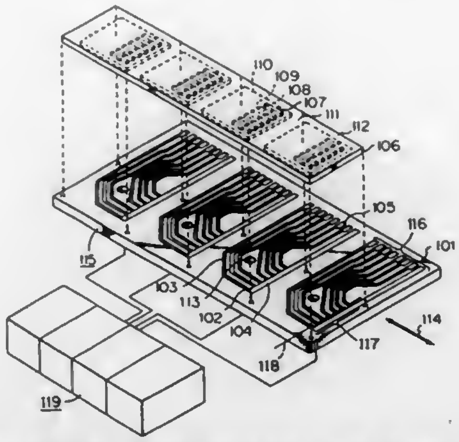
The portion of the term of this patent subsequent to May 30, 2009, has been disclaimed.

Int. Cl.^{6} B41J *2/21*

U.S. Cl. 347—43 **14 Claims**

1. A liquid jet recording head for recording by moving in a predetermined direction with respect to a recording medium and discharging recording liquid, the head comprising:

an integral substrate member including a single substrate, a plurality of at least three electrode patterns, each said pattern having a plurality of electrodes and a like plurality of heat generating element groups formed side-by-side directly on one side of said single substrate, each said group of heat generating elements being substantially identical and substantially identically oriented, including having the same number of plural heat generating elements for generating thermal energy; and



an integral liquid chamber member having a plurality of recesses attached to said integral substrate member to form on said substrate a like plurality of substantially identical separate liquid chambers prevented from fluid communication with each other for accommodating recording liquids having different colors or densities, each said separate liquid chamber being associated with one of said heat generating element groups and including a plurality of liquid paths and a plurality of like discharge port groups each having a plurality of discharge ports, each liquid path being associated with one of said discharge ports adjacent one of said heat generating elements in said associated group, so that recording liquid supplied to said liquid chamber can be supplied to said heat generating elements in said associated group for selective discharge from said discharge ports by the thermal energy generated by said heat generating elements, and each said discharge port group being associated with a corresponding said heat generating element group and including the same number of discharge ports identically arranged in all of said discharge port groups with the corresponding discharge ports in different said discharge port groups being equally spaced relative to each other in the predetermined direction.

5,463,413

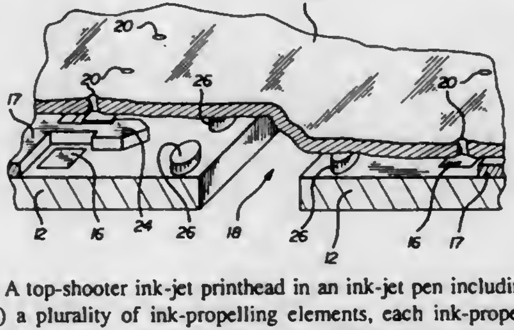
INTERNAL SUPPORT FOR TOP-SHOOTER THERMAL INK-JET PRINTHEAD

May F. Ho, La Mesa, Calif., and Ellen Tappon, Corvalis, Oreg., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jun. 3, 1993, Ser. No. 72,298

Int. Cl.^{6} B41J *2/175;2/05*

U.S. Cl. 347—65 **15 Claims**



1. A top-shooter ink-jet printhead in an ink-jet pen including:

(a) a plurality of ink-propelling elements, each ink-propelling element comprising a resistor element formed on a top surface of a substrate and disposed in a separate drop ejection chamber defined by three barrier walls formed in a barrier layer on said top surface of said substrate and a fourth side open to a reservoir of ink common to at least some of said ink-propelling elements and defining a barrier inlet channel, said barrier inlet channel having opposing side walls for directing ink from said reservoir to an associated drop ejection chamber;

(b) a plurality of nozzles comprising orifices disposed in a cover plate near said ink-propelling elements, each orifice operatively associated with a resistor element for ejecting a quantity of ink normal to the plane defined by each said element and through said orifices toward a print medium in defined patterns to form alphanumeric characters and graphics thereon;

(c) a common ink feed channel fluidically connected to said reservoir of ink beneath said substrate to accept a flow of ink therefrom and fluidically connected to said barrier inlet channel, said ink feed channel defining an edge on said top surface of said substrate, wherein ink is supplied to each of said ink-propelling elements from said common ink feed channel through said barrier inlet channel, the distance from said ink feed channel to the entrance of each said barrier inlet channel defining a shelf length of said printhead; and

(d) a plurality of pillars, each pillar associated with an ink-propelling element and positioned along said edge of said ink feed channel opposite said entrance to said barrier inlet channel so as not to be located within any portion of said barrier inlet channel,

said plurality of pillars serving to prevent particle contamination of said drop ejection chamber and to support said cover plate, each of said pillars being formed along with said barrier layer and being formed of the same material used to form said barrier layer so that said pillars are the same height as said barrier layer, a gap between adjacent pillars providing filtering of particles having a dimension greater than a width of said gap.

5,463,414

MULTI-CHANNEL ARRAY DROPLET DEPOSITION APPARATUS

Stephen Temple, Cambridge, and Mark R. Shepherd, Royston, both of, Great Britain, assignors to Xaar Limited, Cambridge, England

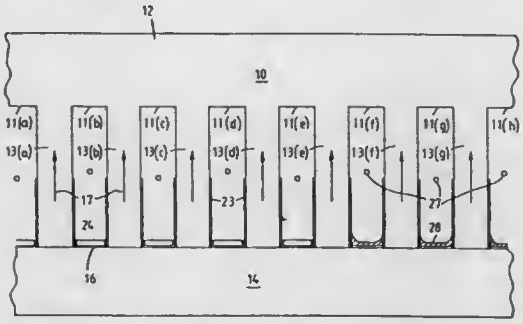
PCT No. PCT/GB92/01085, § 371 Date Feb. 15, 1994, § 102(e) Date Feb. 15, 1994, PCT Pub. No. WO92/22429, PCT Pub. Date Dec. 23, 1992

PCT Filed Jun. 17, 1992, Ser. No. 167,894

Claims priority, application United Kingdom, Jun. 17, 1991, 9113023

Int. Cl.^{6} B41J *2/045*

U.S. Cl. 347—68 **23 Claims**



1. A method of manufacturing a multichannel array droplet deposition apparatus which comprises the steps of providing a base sheet having a layer of piezoelectric material poled normal to said sheet, forming an array of parallel, open-topped droplet liquid channels in said base sheet layer so that the piezoelectric material provides upstanding walls separating successive channels, the walls having respective channel facing surfaces, forming electrodes on said channel facing surfaces, bonding a channel closure sheet to the walls, providing nozzles respectively communicating with the channels and providing means for connecting a source of droplet liquid to the channels, characterised by forming said channel closure sheet with an array of parallel conductive tracks spaced at intervals corresponding with respective spacings of said channels, locating each of said tracks in position parallel with and opposite a corresponding one of said channels and sealing the closure sheet to the channel walls by forming bonds which mechanically and electrically connect each of said tracks to the electrodes on said channel facing surfaces of the walls of said corresponding channel.

5,463,415

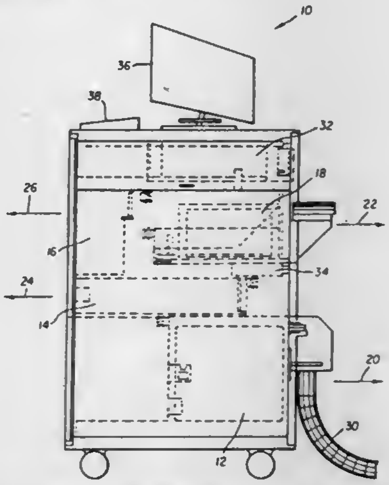
FOUR INCH PRINT ENGINE MODULE

James D. McCann, Waynesville, and Randal L. Mullins, Jamestown, both of Ohio, assignors to Scitex Digital Printing, Inc., Dayton, Ohio

Filed May 29, 1992, Ser. No. 891,334

Int. Cl.^{6} B41J *2/02*

U.S. Cl. 347—74 **14 Claims**



1. An integral print engine module for a continuous ink jet printer having a remote print head, comprising:

a. a removable fluid system unit, the fluid system unit including,
  a fluid system,
  cables associated with the fluid system,
  retractor means for containing the cables,
  means for mounting the fluid system within the integral print engine module, and
  an umbilical interface;
b. a removable charge power unit;
c. a removable power supply unit; and
d. a removable card cage assembly unit.

5,463,416

REDUCED NOZZLE VISCOUS IMPEDANCE

Anthony D. Paton, Cambridge, England, and Jurgen M. Kruse, Tucson, Ariz., assignors to XAAR Limited, Cambridge, England

PCT No. PCT/GB92/00054, § 371 Date Sep. 13, 1993, § 102(e) Date Sep. 13, 1993, PCT Pub. No. WO92/12014, PCT Pub. Date Jul. 23, 1992

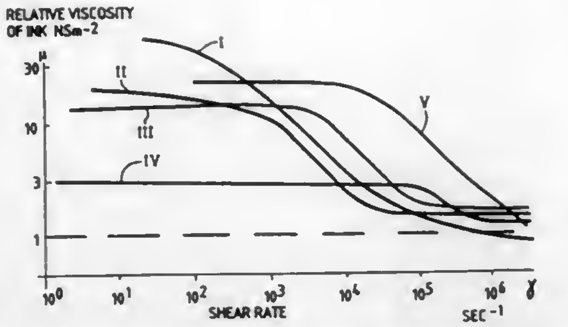
PCT Filed Jan. 10, 1992, Ser. No. 90,050

Claims priority, application United Kingdom, Jan. 11, 1991, 9100613

Int. Cl.^{6} G01D *15/18*

U.S. Cl. 347—100 **8 Claims**

1. A method of depositing drops of liquid, comprising the steps of providing pulsed droplet deposition apparatus having a liquid chamber, a nozzle communicating with said chamber for expulsion of liquid droplets from the chamber therethrough, liquid replenishment means connected with said chamber and energy pulse applying means for imparting pulses of energy to the liquid in the chamber to effect droplet ejection from said nozzle, and applying through said energy pulse applying means pulses of a duration to the liquid in said chamber, said liquid having a first viscosity at



high shear rate and a second viscosity higher than said first viscosity at low shear rate, said liquid having a relaxation time constant approximately equal to or greater than the duration of pulses applied thereto and having a characteristic time in said nozzle approximately equal to or less than the duration of said pulses.

5,463,417

BLEACHING METHOD FOR THERMOSENSITIVE RECORDING MEDIUM

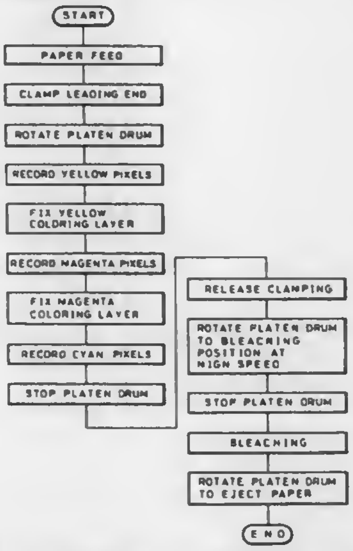
Kenji Yamakawa, Saitama, Japan, assignor to Fuji Photo Film Company, Ltd., Kanagawa, Japan

Filed Aug. 26, 1994, Ser. No. 297,523

Claims priority, application Japan, Sep. 1, 1993, 5-217539

Int. Cl.^{6} B41J *2/32*

U.S. Cl. 347—212 **16 Claims**



7. A method of bleaching a thermosensitive color recording medium having first, second and third coloring layers for respectively developing three primary colors, said first, second and third coloring layers being formed one atop another in said order from the top, in a direct thermal printer having a thermal head, a first lamp radiating ultraviolet rays having a wavelength range of about 420 nm which optically fix said first color recording layer, and a second lamp radiating ultraviolet rays having a wavelength range of about 365 nm which optically fix said second color recording layer, a carrying device for carrying said thermosensitive color recording medium thereon to move said thermosensitive color recording medium relative to said thermal head and said ultraviolet lamps, and a clamp member for clamping an end portion of said thermosensitive color recording medium, so as to secure said thermosensitive color recording medium to said carrying device, said method comprising the steps of:

turning on said second lamp during recording of said third coloring layer as well as during optically fixing of said second coloring layer;

releasing said clamp member from said thermosensitive color recording medium, after thermal recording and optical fixing of said thermosensitive color recording medium;

moving thereafter said carrying device at a speed higher than that used in thermal recording and optical fixing of said thermosensitive color recording medium, so as to feed said end portion to said second lamp;

stopping said carrying device for a predetermined time, when said end portion of said thermosensitive recording medium is disposed directly below the center of said second lamp, while projecting ultraviolet rays from said second lamp onto said end portion thereby to bleach said end portion;

thereafter turning off said second lamp; and

ejecting thereafter said thermosensitive color recording medium from said direct thermal printer.

5,463,418

PLURAL-BEAM SCANNING OPTICAL APPARATUS

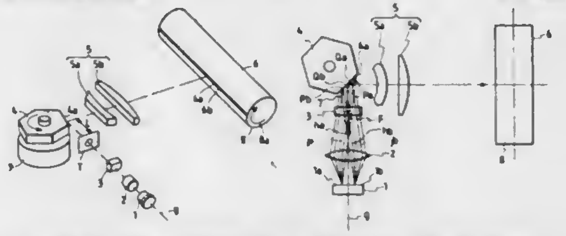
Masamichi Tateoka, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 922,775, Jul. 31, 1992, abandoned. This application May 4, 1993, Ser. No. 56,740

Claims priority, application Japan, Aug. 3, 1991, 3-217868

Int. Cl.^{6} B41J *2/435*

U.S. Cl. 347—244 **8 Claims**



1. A plural-beam scanning optical apparatus comprising:

light source means having a plurality of light emitting portions;

a first optical system for converting a plurality of divergent light beams from said light source means into parallel light beams;

a light deflector for deflecting the plurality of light beams from said first optical system;

a stop disposed between said first optical system and said light deflector; and

a second optical system for condensing the plurality of light beams deflected by said light deflector on a scanned surface,

said plurality of light emitting portions being arranged in a direction oblique with respect to the main scanning direction of the light beams on said scanned surface, said apparatus satisfying the following condition:

$$d/2\cdot(n-1)\cdot L/f<0.2\text{(mm)},$$

where n is the number of said plurality of light emitting portions, d is the pitch thereof, L is the distance from a reference position on the deflecting surface of said light deflector to said stop, and f is the focal length of said first optical system.

5,463,419

IMAGE SIGNAL PROCESSING DEVICE FOR THINNING IMAGES

Osamu Saito, Asaka, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 6, 1994, Ser. No. 254,770

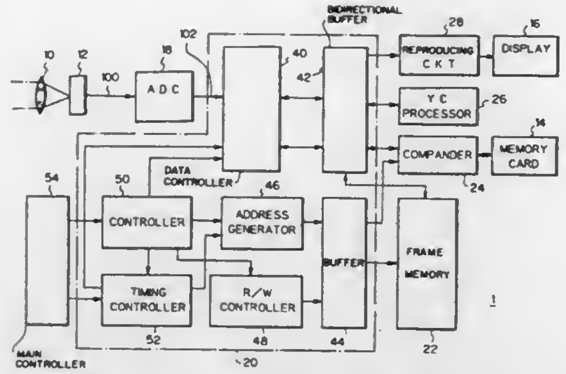
Claims priority, application Japan, Jun. 11, 1993, 5-140300

Int. Cl.^{6} H04N *5/907*

U.S. Cl. 348—233 **14 Claims**

10. An image processing device for recording in a data recording medium an image signal representative of an object which is picked up by an imaging device, said device comprising:

a memory circuit for storing the image signal representative of an object;



a coder circuit for compressing the image signal stored in said memory circuit by compression and outputting the compressed image signal to the data recording medium;

an output circuit for outputting the image signal stored in said memory circuit to a display; and

a storage controller for controlling transfer of the image signal to thereby control storage of the image signal in said memory circuit;

said storage controller comprising:

- an address generator circuit for generating, when the image signal is to be written to or read from said memory circuit, an address signal designating an address of said memory circuit;
- a read/write control circuit for generating a control signal which selectively controls writing or reading of the image signal to or from, respectively, said memory circuit;
- said address generator circuit generating, when the image signal is to be written to or read from said memory circuit, the address signal to be used;
- said storage controller selectively controlling, based on the address signal and the control signal, writing or reading of the image signal to/or from said memory circuit, respectively.

5,463,420

PHOTOELECTRIC CONVERSION SYSTEM

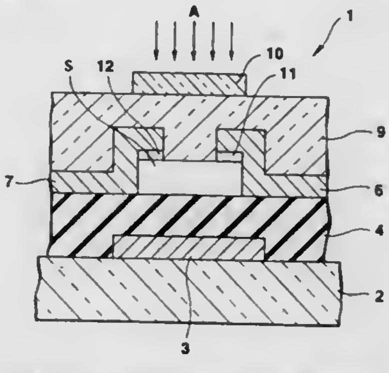
Hiroyasu Yamada, Hachioji, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Oct. 8, 1993, Ser. No. 133,563

Claims priority, application Japan, Jan. 16, 1992, 4-304587

Int. Cl.^{6} H01L *31/10*

U.S. Cl. 348—294 **13 Claims**



1. A photoelectric conversion system comprising:

a photosensor including a semiconductor layer having a photoelectric conversion function, source and drain electrodes separately disposed on said semiconductor layer, a first gate electrode disposed on one surface side of said semiconductor layer, and a second gate electrode disposed on the other surface aide of said semiconductor layer, at least one of said first and second gate electrodes having a light transmission property;

sense state controlling means for applying voltages to said first gate electrode to control a hold state in which charges generated in said semiconductor layer by application of illumination light are held and a non-hold state in which the charges are not held;

selection controlling means for alternately applying a selection voltage and a non-selection voltage to said second gate electrode to set up a selection state in which charges generated in said semiconductor layer by application of illumination light are read out from said drain electrode and set up a non-selection state in which charges are not read out;

wherein a drain current corresponding to charges generated in said semiconductor layer of said photosensor in said non-selection state in a case of illumination light is the same or less than that in said selection state in a case of no illumination light, and a ratio of a drain current in said selection state in a case of illumination light and that in said non-selection state in the case of illumination light is 1×10^4, or greater;

wherein semiconductor layers highly doped with n type impurity are disposed between said semiconductor layer and said source electrode and between said semiconductor layer and said drain electrode; and

wherein said state in which the charges generated in said semiconductor layer are held is set up when a voltage applied to said first gate electrode by said sense state controlling means is negative.

5,463,421

SOLID-STATE IMAGE APPARATUS WHICH SWEEPS OUT INDEPENDENTLY INEFFECTIVE ELECTRIC CHARGES SO THAT THE EXPOSURE PERIOD CAN BE VARIED WITHIN A RANGE FROM ONE FIELD PERIOD TO ONE FRAME PERIOD

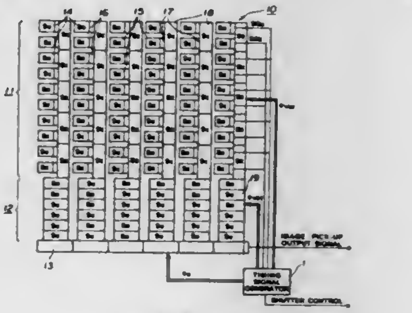
Hiroaki Deguchi; Masahiro Yamashita, and Yukihiro Masuda, all of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

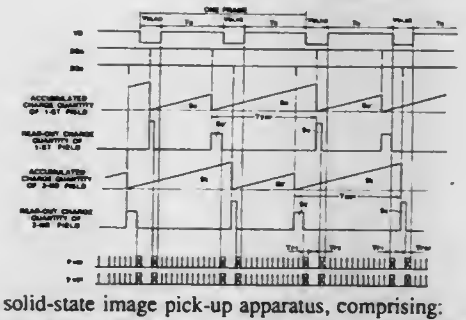
Filed May 26, 1993, Ser. No. 67,284

Claims priority, application Japan, May 30, 1992, 4-163792; May 30, 1992, 4-164046

Int. Cl.^{6} H04N *5/335*

U.S. Cl. 348—296 **6 Claims**





1. A solid-state image pick-up apparatus, comprising:

a solid-state image sensor comprised of a plurality of photosensitive elements arranged in a form of a matrix having rows and columns, and responsive to a light incident thereon to accumulate electric charges;

a plurality of vertical shift registers coupled to the respective columns of said matrix of said photosensitive elements, said respective vertical shift registers being adapted for receiving electrical charges from said photosensitive elements of odd rows in response to a first sensor gate signal, and adapted for receiving electric charges from said photosensitive elements of even rows in response to a second sensor gate signal;

storage means coupled to said vertical shift registers, and adapted for receiving electric charges from said vertical shift registers in response to a first transfer signal;

a horizontal shift register coupled to said storage means, and adapted for receiving electric charges from said storage means in response to a second transfer signal for outputting, column by column, charges from said solid-state image sensor;

moans for generating said first sensor gate signal having a first and second timing during a frame period;

means for sweeping out ineffective electric charges at said second timing, within said frame period, of said first sensor gate signal from said photosensitive elements of said odd rows;

means for generating said second sensor gate signal having a first and second timing, different from the first and second timing of said first sensor gate signal, during a frame period; and

means for sweeping out ineffective electric charges at said second timing, within said frame period, of said second sensor gate signal from said photosensitive elements of said even rows,

so that the accumulating period of effective electric charges for the odd and even rows is adjustably varied within a range from one field period to one frame period.

5,463,422

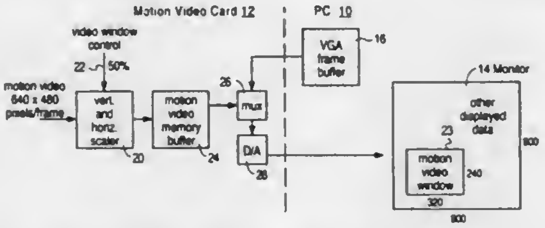
DATA PROCESSING TECHNIQUE FOR LIMITING THE BANDWIDTH OF DATA TO BE STORED IN A BUFFER

Miles S. Simpson, San Jose; Scott A. Kimura, Saratoga, and Steven L. Gibson, San Ramon, all of Calif., assignors to Auravision Corporation, Fremont, Calif.

Filed Oct. 13, 1993, Ser. No. 136,621

Int. Cl.^{6} H04N *7/26*

U.S. Cl. 348—390 **15 Claims**



1. A video processing method comprising the steps of:

applying pixel data having a first bandwidth to a horizontal scaler, said pixel data being for use in conjunction with a pixel array type display, said pixel data for controlling multiple rows of pixels in said display;

determining a substantially maximum bandwidth of a data buffer for storing said pixel data;

in response to said step of determining, controlling said horizontal scaler to reduce an amount of pixel data associated with each horizontal row of pixels in said display to reduce said first bandwidth of said pixel data to be at a second bandwidth which is at or below said maximum bandwidth of said data buffer;

storing resulting pixel data having said second bandwidth in said data buffer for subsequent display;

outputting pixel data from said data buffer; and

adding pixel data to said pixel data outputted from said data buffer to compensate for the reduction of pixel data during said step of controlling said horizontal scaler.

5,463,423

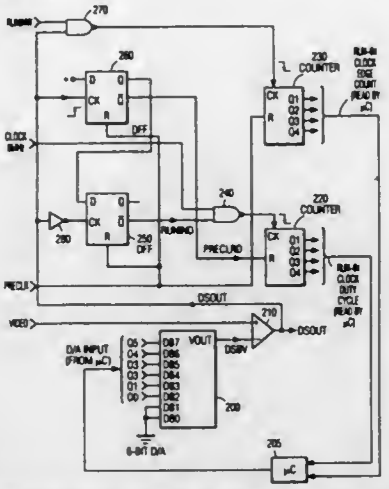
AUXILIARY VIDEO DATA DETECTOR AND DATA SLICER

Juri Tults, Indianapolis, Ind., assignor to Thomson Consumer Electronics, Inc., Indianapolis, Ind.

Filed Mar. 11, 1992, Ser. No. 850,200

Int. Cl.^{6} H04N *7/08*

U.S. Cl. 348—465 **20 Claims**



1. In a system for processing a video signal, said video signal including an auxiliary information signal component having a reference signal component and a data signal component, said reference signal component varying periodically at a predetermined frequency, apparatus comprising:

comparator means having a first input coupled to said video signal for receiving said reference signal component and producing an output signal having one of first and second values, said output signal having said first value when said video signal exceeds a threshold level at a second input and said output signal having said second value when said video signal is less than said threshold level at said second input;

means responsive to said output signal for producing a control signal having a value representative of the duty cycle of said output signal, said control signal producing means being enabled for modifying said control signal value when said output signal has said first value and being disabled to prevent modifying said control signal value when said output signal has said second value; and

means for modifying the magnitude of said threshold level at said second input of said comparator means in response to said control signal to produce an output signal having a predetermined duty cycle.

5,463,424

MULTI-CHANNEL TRANSMITTER/RECEIVER SYSTEM PROVIDING MATRIX-DECODING COMPATIBLE SIGNALS

Roger W. Dressler, Danville, Calif., assignor to Dolby Laboratories Licensing Corporation, San Francisco, Calif.

Filed Aug. 3, 1993, Ser. No. 102,072

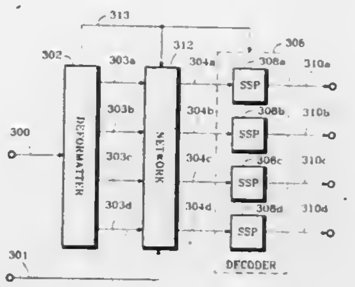
Int. Cl.^{6} H04N *5/60*

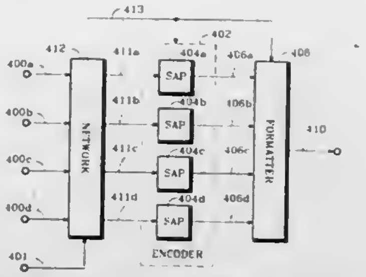
U.S. Cl. 348—485 **25 Claims**

1. A system for processing multiple channels of audio information, said system comprising

a transmitter comprising

first networking means for generating intermediate signals by changing the phase of information received from one or more of said multiple channels of audio information relative to the phase of information received from another of said multiple channels of audio information, wherein said changing phase effects changes in phase not equal to 180 degrees,





encoding means responsive to said first networking means for generating subband signals representing frequency subbands of said intermediate signals, and

formatting means for assembling said subband signals into an encoded signal suitable for transmission or storage; and

a receiver comprising

deformatting means for receiving said encoded signal and for extracting recovered subband signals therefrom,

second networking means for combining, in one or more subbands, said recovered subband signals corresponding to at least two of said multiple channels of audio information, and

decoding means responsive to said second networking means for generating recovered audio information.

20. A system for processing multiple channels of audio information, said system comprising

a transmitter comprising

a phase-change network coupled to one or more channels of said multiple channels of audio information, wherein said phase-change network effects a phase change substantially equal to ninety degrees,

a split-band coder coupled to said phase-change network,

a multiplexor coupled to said split-band coder; and

a receiver responsive to a signal transmitted by said transmitter, said receiver comprising

a demultiplexor, and

a split-band decoder coupled to said demultiplexor.

5,463,425

SYNCHRONIZING APPARATUS FOR SYNCHRONIZING AUDIO SIGNAL WITH VIDEO SIGNAL

Katsuichi Tachi, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 94,319, Jul. 21, 1993, abandoned.
This application Feb. 23, 1995, Ser. No. 393,256
Claims priority, application Japan, Jul. 28, 1992, 4-201329
Int. Cl.^{6} H04N *9/475;7/04;5/76*

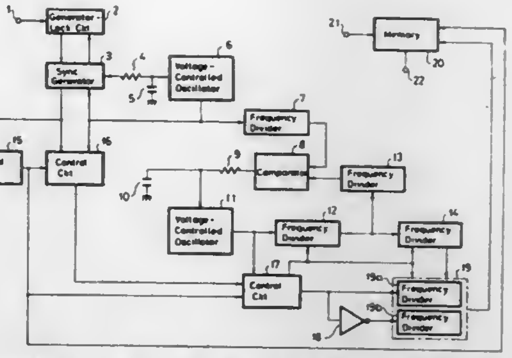
U.S. Cl. 348—515 **6 Claims**

1. A synchronizing apparatus for synchronizing an audio signal with a standard video signal, a sampling frequency of said audio signal differing from a sampling frequency of said standard video signal, comprising:

a memory;

counter means for outputting a count signal representing a count value; and

first and second frequency dividers each continuously receiving a signal having a frequency equal to the sampling frequency of said audio signal for continuously presetting two respective preset values of n and n+1 and supplying said preset values to said memory, said preset values of n and n+1 representing a number of samples of said audio signal to be inserted into a vertical interval of said video signal, wherein said memory is adapted for memorizing said audio signal and outputting said audio signal according to said count signal and said preset values, whereby said audio signal synchronized with said standard video signal is read out from said memory.



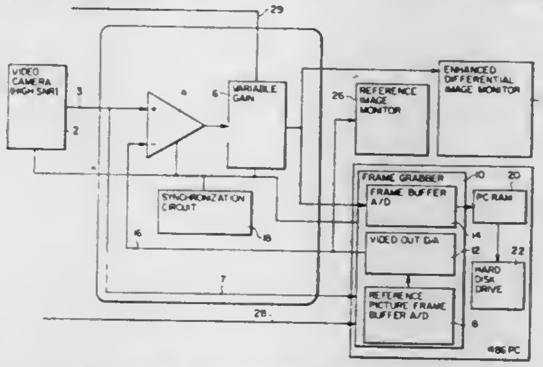
5,463,426

IMAGE ACQUISITION AND ENHANCEMENT METHOD AND SYSTEM

Amiram Grinvald, 1 Meonot Wix, Weizman Institute of Science, Rehovot 76100, Israel

Continuation of Ser. No. 136,917, Oct. 18, 1993, abandoned.
This application Jan. 3, 1995, Ser. No. 368,400
Claims priority, application Israel, Jan. 18, 1992, 103463
Int. Cl.^{6} H04N *5/21*

U.S. Cl. 348—625 **9 Claims**



5. An image enhancement system, comprising:

a differential amplifier, having a first input and a second input, receiving video analog signals applied to said first input;

reference image circuit means connected to said first input of said amplifier, continuously receiving said video analog signals;

means for selecting a video reference image constituted by analog reference signals and digitizing same;

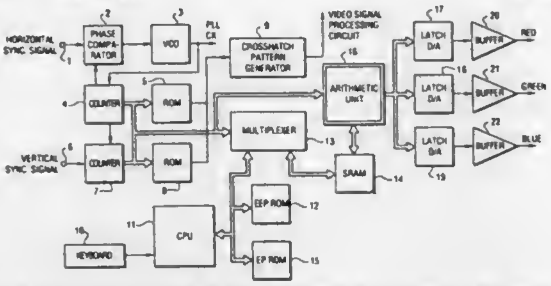
a digital to analog converter for converting said digitized signals into analog signals and for applying said analog signals to the second input of said amplifier;

synchronization circuit for synchronizing said reference signals with said analog video signals;

said differential amplifier including circuit means for continuously subtracting said converted analog signals from said analog video signals, and for amplifying the subtracted signals to form enhanced differential images in real time.

5,463,427
DYNAMIC FOCUSING DEVICE FOR CATHODE RAY TUBE

Masahiro Kawashima, Takatsuki, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Sep. 29, 1993, Ser. No. 128,129
Int. Cl.^{6} H04N *9/28;3/26*
U.S. Cl. 348—806 **5 Claims**



1. A dynamic focusing device for cathode ray tubes, said device comprising:

a crosshatch pattern generating means responsive to horizontal and vertical synchronizing signals for providing a surface of said cathode ray tubes with a crosshatch pattern indicating an adjustment point at which focusing control is carried out, said crosshatch pattern generating means comprising circuit means for producing a cursor indicating the adjustment point for carrying out the focusing control, and for providing a brightness reversed crosshatch pattern at said adjustment point;

an input means for choosing said adjustment point and for controlling the focus at said chosen adjustment point;

a correction data setting means having a memory unit for storing a correction data necessary for proper focusing about said adjustment point, said correction data setting means being coupled to said input means in order to produce said correction data;

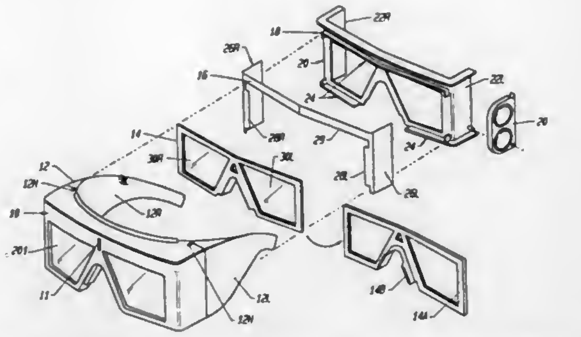
an interpolation data calculating means for producing an interpolation data between two adjacent adjustment points located in a vertical direction by calculating the correction data of said two adjacent adjustment points;

a latch and digital to analog converting means for converting said correction data and said interpolation data into an analog form; and

an output means having an interpolation filter for interpolating characteristics between two adjacent adjustment points located in a horizontal direction, said output means being coupled to said latch and digital to analog converting means and supplying an output signal to said cathode ray tubes.

5,463,428
WIRELESS ACTIVE EYEWEAR FOR STEREOSCOPIC APPLICATIONS

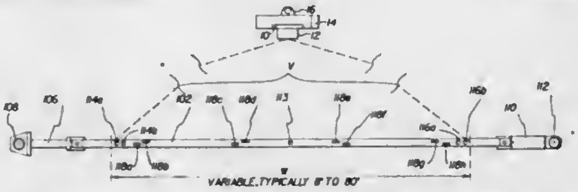
Lenny Lipton, San Rafael; Jeffrey J. Halnon, Richmond; Larry H. Mitchell, Cupertino, and Robert Hursey, Carmel Valley, all of Calif., assignors to StereoGraphics Corporation, San Rafael, Calif.
Filed Feb. 8, 1994, Ser. No. 193,279
Int. Cl.^{6} G02C *1/00*
U.S. Cl. 351—158 **13 Claims**



1. In wireless active eyewear of the type used for viewing field sequential stereoscopic images which are generated along with synchronization information by a video source, said eyewear having a frame including a pair of lens openings and a pair of temple arms, a pair of electro-optical shutters mounted in correspondence with respective lens openings, an electrical circuit in contact with the shutters for driving the shutters out of phase with each other in accordance with the synchronization information, and a battery to power the electrical circuit, the improvement comprising the electro-optical shutters being integrally mounted in a soft and flexible molded gasket, said gasket being substantially nonconductive except for a plurality of conductive regions, said conductive regions being in electrical contact with said electro-optical shutters, wherein said gasket provides a protective shock mounting for the electro-optical shutters.

5,463,429
SURFACE INSPECTION OPTICAL GEOMETRY ALIGNMENT SYSTEM

Dean B. Campbell, Webster, and Henry M. Korytkowski, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Nov. 15, 1993, Ser. No. 152,798
Int. Cl.^{6} H04N *7/18*
U.S. Cl. 348—128 **24 Claims**



1. A method for aligning a camera system with a production web for scanning the web, said camera system defining an elongate field of view having first and second opposed longitudinal edges, said method comprising the steps of:

providing an alignment tape with a plurality of fiducials including pairs of first and second fiducials disposed to longitudinally bisect the field of view from said first and second opposed longitudinal edges, respectively, wherein said plurality of fiducials is patterned to split a pixel between a first and a second fiducial of said plurality of fiducials, and whereby said plurality of fiducials provide alignment across multiple axes;

monitoring a camera signal to determine when said field of view is longitudinally bisected by said pairs of first and second fiducials; and

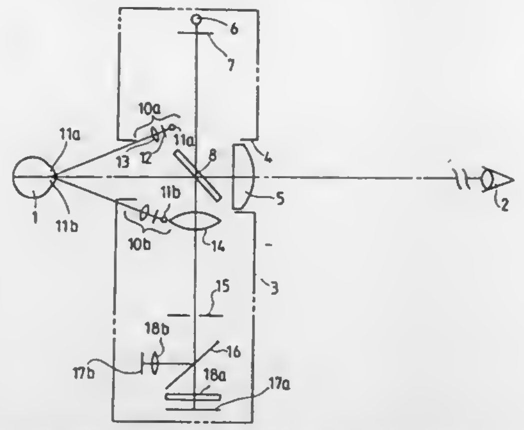
adjusting said field of view of the camera system to mechanically correct optical alignment of said field of view according to said monitored camera signal.

5,463,430
EXAMINATION APPARATUS FOR EXAMINING AN OBJECT HAVING A SPHEROIDAL REFLECTIVE SURFACE

Naoki Isogai, Nishio; Yoshiaki Mimura, Gamagori, and Masanao Fujieda, Toyohashi, all of, Japan, assignors to Nidek Co., Ltd., Aichi, Japan
Filed Jul. 29, 1993, Ser. No. 98,786
Claims priority, application Japan, Jul. 31, 1992, 4-224896; Mar. 31, 1993, 5-098942
Int. Cl.^{6} A61B *3/10;3/107;* **G01B** *11/24*
U.S. Cl. 351—208 **15 Claims**

5. An ophthalmic apparatus for examining an examinee's eye, the apparatus comprising:

a first index projecting optical system for projecting a first point light source at infinity onto a meridional plane of the examinee's eye at a designated angle;



a second index projecting optical system for projecting a second point light source at a finite distance onto the same meridional plane of the examinee's eye at said designated angle;

a detecting optical system for detecting through a photoelectric conversion apparatus respective image height of reflected images formed by the first and second point light sources; and

judging means for judging whether the working distance between the object and the apparatus is correct, in accordance with a signal detected by the photoelectric conversion apparatus.

5,463,431
PERIMETER

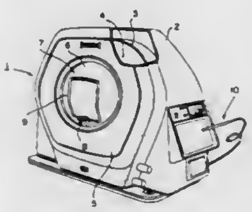
Takeshi Suzuki, and Akihiro Sugiyama, both of Tokyo, Japan, assignors to Kabushiki Kaisha Topcon, Tokyo, Japan

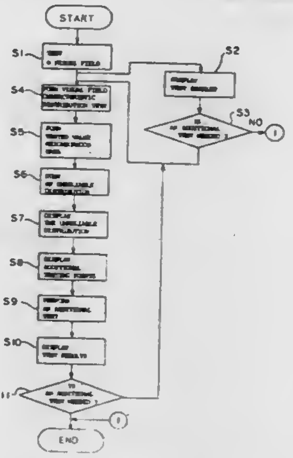
Filed Sep. 16, 1994, Ser. No. 306,975

Claims priority, application Japan, Sep. 16, 1993, 5-229935

Int. Cl.^{6} A61B *3/02*

U.S. Cl. 351—226 10 Claims





1. A perimeter comprising:

a portion for forming data concerning a visual field characteristic distribution in such a way that interpolations are made between tested values of a subject's eye which are obtained by exhibiting a plurality of targets, the visual field characteristic distribution including estimated values; and

a portion for displaying an unreliable distribution which denotes a domain estimated to be distant from said tested values on the basis of both said data concerning the visual field characteristic distribution and data which include the test values, on a distribution of an estimated neighborhood of the tested values.

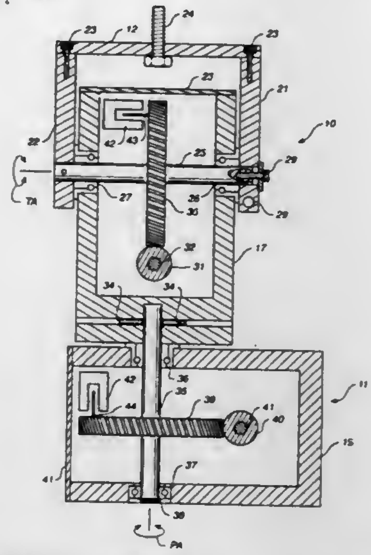
5,463,432
MINIATURE PAN/TILT TRACKING MOUNT

Philip Kahn, 1451 Capuchino Ave., Burlingame, Calif. 94010

Continuation of Ser. No. 66,672, May 24, 1993, abandoned. This application May 24, 1995, Ser. No. 449,257

Int. Cl.^{6} G03B *21/00;29/00*

U.S. Cl. 352—243 1 Claim



1. A pan/tilt device comprising:

a pan assembly fixed to a support apart from said pan/tilt device, said pan assembly having a pan assembly shaft, said pan assembly shaft being coupled to rotate according to the rotation of a shaft of a pan motor, the rotation of said pan assembly shaft being relative to said support apart from said pan/tilt device, the rotation of said shaft of said pan motor being controlled according to a pan motor input signal;

a tilt assembly fixed to and rotatable with said pan assembly shaft, said tilt assembly having a single continuous tilt assembly shaft, said tilt assembly shaft being coupled to rotate according to the rotation of a shaft of a tilt motor, the rotation of said tilt assembly shaft being relative to said tilt assembly, the rotation of said shaft of said tilt motor being controlled according to a tilt motor input signal, said tilt assembly shaft being perpendicular to said pan assembly shaft; and

a payload mounting plate fixed to and rotatable with said tilt assembly shaft;

wherein said pan assembly includes a pan housing having the pan motor mounted thereto, said pan housing supporting said pan assembly shaft, said pan housing enclosing a set of pan gears coupling said pan assembly shaft to rotate according to the rotation of said shaft of said pan motor, comprising a pan worm gear and a pan worm wheel and a set of pan position detection devices for sensing the position of said pan worm wheel, said pan housing providing protection to said pan worm wheel, said pan worm gear, and said pan position detection devices from environmental contaminants;

wherein the shaft of said pan motor is perpendicular to said pan assembly shaft, wherein said shaft of said pan motor rotates said pan worm gear which is engaged with said pan worm wheel which is fixed to said pan assembly shaft such that rotation of said shaft of said pan motor causes said pan assembly shaft to rotate;

wherein said tilt assembly includes a tilt housing having the tilt motor mounted thereto, said tilt housing supporting said tilt assembly shaft, said tilt housing enclosing a set of tilt gears coupling said tilt assembly shaft to rotate according to the rotation of said shaft of said tilt motor, comprising a tilt worm gear and a tilt worm wheel and a set of tilt position detection devices for sensing the position of said tilt worm wheel, said tilt housing providing protection to said tilt worm wheel, said tilt worm gear, and said tilt position detection devices from environmental contaminants;

wherein shaft of said tilt motor is perpendicular to said tilt assembly shaft, wherein said shaft of said tilt motor rotates said tilt worm gear which is engaged with said tilt worm wheel which is fixed to said tilt assembly shaft such that rotation of said shaft of said tilt motor causes said tilt assembly shaft to rotate; and

wherein said tilt shaft includes a tilt shaft portion that extends outside of said tilt housing, and said payload mounting plate is fixed to said tilt shaft portion.

5,463,433
IMAGE PROJECTOR

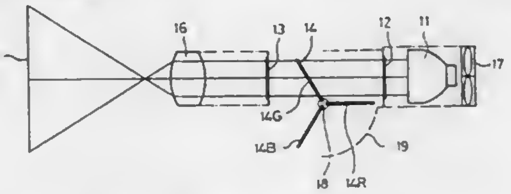
Hee S. Koo, Seoul, Rep. of Korea, assignor to Goldstar Co., Ltd., Seoul, Rep. of Korea

Filed Sep. 7, 1994, Ser. No. 301,497

Claims priority, application Rep. of Korea, Sep. 16, 1993, 1993-18698

Int. Cl.^{6} G03B *21/14*

U.S. Cl. 353—84 **8 Claims**



1. An image projector, comprising:

a lamp for generating parallel light;

image displaying means for displaying a video signal;

a rotating shaft rotatably disposed at a projector body;

a steamboat paddle wheel-shaped color filter, disposed to receive a visual ray from the lamp, for passing through light rays with a selected color bandwidth as well as substantially cooling the image displaying means; and

a projection lens for projecting an image displayed onto the image displaying means, onto a screen.

5,463,434
VIDEO PROJECTOR WITH A PLURALITY OF PROJECTION DEVICES

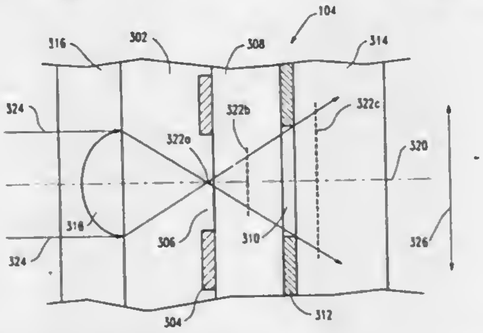
Hideyuki Kanayama; Ryuhei Amano; Kenji Yamauchi, and Keiichi Kanatani, all of Osaka, Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Apr. 26, 1994, Ser. No. 233,235

Claims priority, application Japan, Apr. 26, 1993, 5-099378

Int. Cl.^{6} G03B *21/00*

U.S. Cl. 353—94 **20 Claims**



1. A video projector comprising:

a first projector device having a first light source, a first display panel assembly for receiving light from said first light source and forming a plurality of first image elements, a first projection lens having a first focal point position and disposed at a light emitting side of said first display panel assembly for projecting said plurality of first image elements a predetermined distance, and a first adjusting device for changing a first relative position between said first display panel assembly and said first projection lens to make each of said plurality first image elements have a first size at said predetermined distance,

wherein said first display panel assembly includes a first condenser device having a first plurality of condenser lenses disposed at a light incident side of said first display panel assembly, a first black matrix defining therein a first plurality of apertures, each of said apertures being associated with each of said condenser lenses and each of said plurality of first image elements being associated with each of said apertures; and

a second projector device having a second light source, a second display panel assembly for receiving light from said second light source and forming a plurality of second image elements, a second projection lens with a second focal point position disposed at a light emitting side of said second display panel assembly for projecting said plurality of second image elements said predetermined distance in a manner such that said plurality of first image elements and said one or more second image elements are disposed adjacent with each other in an interleaved manner, and a second adjusting device for changing a second relative position between said second display panel assembly and said second projection lens to make each of said plurality of second image elements have a second size at said predetermined distance, said second size of each of said plurality of second image elements being substantially equal to said first size of each of said plurality of first image elements,

wherein said second display panel assembly includes a second condenser device having a second plurality of condenser lenses disposed at a light incident side of said second display panel assembly, a second black matrix defining therein a second plurality of apertures, each of said apertures being associated with each of said condenser lenses and each of said plurality of second image elements being associated with each of said apertures.

5,463,435
CAMERA

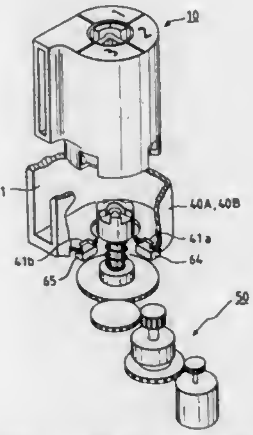
Akira Ezawa, Shin, Japan, assignor to Nikon Corporation, Tokyo, Japan

Filed Feb. 3, 1995, Ser. No. 384,453

Claims priority, application Japan, Feb. 9, 1990, 2-030508; Apr. 2, 1990, 2-087860; Apr. 2, 1990, 2-087861; Jul. 16, 1990, 2-185415; Jul. 18, 1990, 2-189994

Int. Cl.^{6} G03B *7/00*

U.S. Cl. 354—21 **18 Claims**



1. A camera capable of loading a film magazine which has a spool capable of being rotated to wind and feed a film and indicating means independent of said film having a first position indicative of an unexposed condition of said film and a second position indicative of an exposed condition of said film, comprising:

a magazine chamber in which said film magazine is loadable regardless of which of said positions said indicating means is disposed in;

detecting means for detecting the position of said indicating means of said film magazine loaded in said magazine chamber; and

control means responsive to said detecting means for controlling a photographing operation, said control means inhibiting the photographing operation when said detecting means detects that said indicating means is at said second position.

5,463,436

REMOTE CONTROLLABLE CAMERA SYSTEM

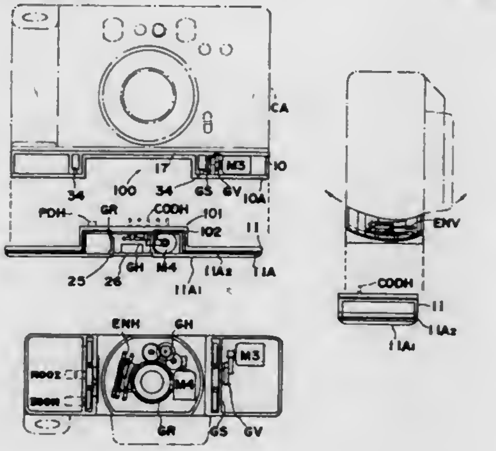
Dai Shintani; Hiroyuki Okada, both of Sakai; Takeo Hoda, Kawachinagano; Shuji Izumi, Sakai; Hiromu Mukai, Kawachinagano; Osamu Hatamori, Osaka, and Sadafusa Tsuji, Osakasayama, all of, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 615,434, Nov. 16, 1990, abandoned. This application May 9, 1994, Ser. No. 240,096

Claims priority, application Japan, Nov. 17, 1989, 1-300127; Nov. 17, 1989, 1-300128

Int. Cl.^{6} G03B *19/00*

U.S. Cl. 354—81 **21 Claims**



9. A remote controllable camera system, comprising:

a remote control device for sending a predetermined signal;

a receiver which receives the predetermined signal sent from said remote control device;

a first driving device which moves an optical axis of a phototaking lens right and left according to the received signal, said first driving device being provided in a camera body in a built-in manner; and

a second driving device which moves the optical axis of the photo-taking lens up and down according to the received signal, said second driving device being separable from said first driving device and said second driving device being separate and detachable from the camera body and being separated from the first driving device when detached from the camera body.

5,463,437

STROBE CONTROL APPARATUS OF CAMERA

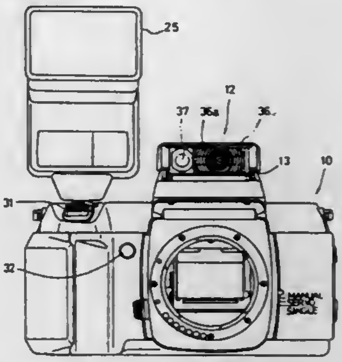
Satoshi Takami, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 982,009, Nov. 24, 1992, Pat. No. 5,361,120, which is a continuation of Ser. No. 593,970, Oct. 9, 1990, abandoned. This application Jul. 12, 1994, Ser. No. 273,823

Claims priority, application Japan, Jan. 6, 1989, 1-261809; Jan. 11, 1989, 1-264534; Jan. 16, 1989, 1-268671; Jan. 16, 1989, 1-268672

Int. Cl.^{6} G03B *15/03*

U.S. Cl. 354—149.11 **12 Claims**



1. A strobe control apparatus for a strobe-incorporated camera, comprising:

a light emitter that is supported in a camera body by a supporting mechanism, said light emitter being movable between a retracted position and an operative position;

a drive mechanism for moving said light emitter between said retracted position and said operative position in response to an occurrence of a predetermined condition, said light emitter being controlled to emit light in response to said predetermined condition;

means for calculating exposure factors in accordance with a brightness of an object to be photographed; and

means for setting said exposure factors if said drive mechanism is unable to move said light emitter to said operative position.

5,463,438

PARALLAX CORRECTING MECHANISM OF A ZOOM FINDER OF A CAMERA

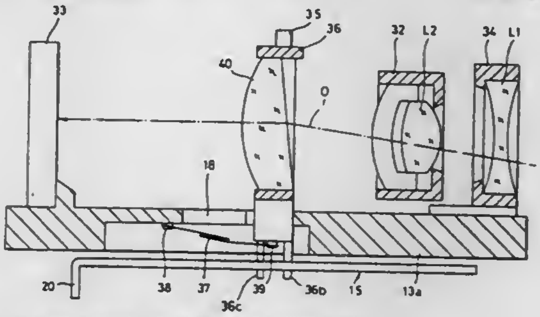
Kosei Kosako, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 151,147, Nov. 12, 1993, abandoned. This application Oct. 28, 1994, Ser. No. 330,617

Claims priority, application Japan, Jan. 18, 1993, 5-000920 U

Int. Cl.^{6} G03B *13/14*

U.S. Cl. 354—221 **21 Claims**



1. A zoom finder of a camera comprising:

a variable power zoom finder optical system;

a cam plate linearly movable within a plane of said cam plate, said cam plate being provided with a switching pawl;

a light-refracting, parallax error compensating optical member having a rotating axis which is perpendicular to the plane in which said cam plate moves, said parallax error compensating optical member being rotatable between a retracted position, in which said parallax error compensating optical member is retracted from an optical path of said optical system and a compensating position, in which said parallax error compensating optical member is in said optical path, and compensates for parallax error by refracting light;

said parallax error compensating optical member being provided with a pair of engaging fingers which engage with said switching pawl to rotate said parallax error compensating optical member into and out of said optical path in association with linear movement of said cam plate; and

a snap action mechanism having a torsion spring, wherein an immediate rotation of said parallax error compensating optical member occurs between said compensating position and said retracted position when said parallax error compensating optical member moves beyond a point of instability of said torsion spring in a direction of said compensating position and said retracted position, respectively.

5,463,439

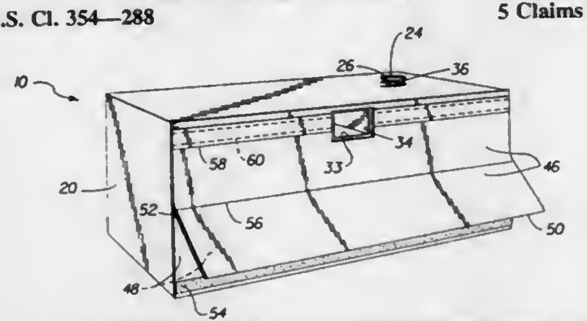
FOLD-IN INFORMATION-BEARING PANEL AND FOLD-OUT WRITE-ON PANEL FOR OUTER COVER OF SINGLE-USE CAMERA

Dennis R. Zander, Penfield, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 19, 1994, Ser. No. 246,053

Int. Cl.^{6} G03B *17/02;17/24*

U.S. Cl. 354—288 **5 Claims**



1. A decorative outer cover for a camera body of a single-use camera, comprising:

a single piece information-bearing panel and write-on panel connected together at a common fold line, said information-bearing panel being located on top of said write-on panel to substantially conceal the write-on panel and being foldable beneath the write-on panel along said fold line to substantially reveal the write-on panel; and

securing means located to hold said write-on panel folded beneath said information-bearing panel and which can release the write-on panel to allow it to be unfolded, and located to hold said write-on panel unfolded with said information-bearing panel folded beneath the write-on panel.

5,463,440

PHOTOGRAPHIC MATERIAL ADVANCEMENT ADAPTATION UNIT FOR PLANT FOR CONTINUOUS DEVELOPMENT OF PHOTOGRAPHIC MATERIAL

Renzo Panontin, and Ivo Del Ben, both of Azzano, Italy, assignors to G.P.E. S.R.L., Azzano Decimo, Italy

Filed Dec. 14, 1993, Ser. No. 166,039

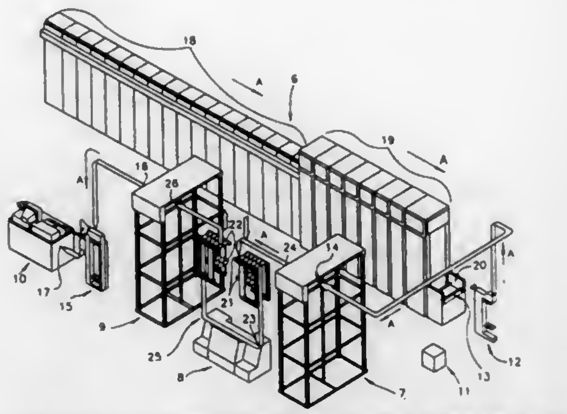
Claims priority, application Italy, Dec. 14, 1992, BL92A0016

Int. Cl.^{6} G03D *3/08;13/00*

U.S. Cl. 354—298 **19 Claims**

1. A photographic material advancement adaptation unit for a plant for continuous development of photographic material, said plant comprising

a plurality of operating units of a conventional type selected from the group consisting of developing machine, collecting storage means, quality-control table, cutting equipment, and combinations thereof, which operating units are combinable with each other in different manners, such that a photographic material is passable for treating of the photographic material through the plurality of operating units;



a plurality of adaptation units, wherein each of the plurality of adaptation units is disposed between two otherwise neighboring operating units of the plurality of operating units, said adaptation units comprising guide means shaped as rotating rollers for passing the photographic material and at least a driving band leader for entraining the photographic material therethrough, wherein the plurality of adaptation units includes a first adaptation unit and a second adaptation unit, wherein the first adaptation unit and the second adaptation unit are autonomous and separated as well as removably interposable between two operating units which are consecutive to each other and wherein the first adaptation unit and the second adaptation unit comprise temporary collecting means, shaped as stationary upper rollers and movable lower rollers, for winding the photographic material thereon, adapted to compensate for changes in advancement speed of the photographic material through the different plant units, by means of a succession of storing and dispensing of such photographic material between the first adaptation unit and the second adaptation unit;

at least a display unit of a conventional type connected to the plurality of operating units and to the plurality of adaptation units for aiding in controlling and inspecting operation of said operating units and of said adaptation units;

a plurality of powered means, wherein each of the powered means is associated with one of said operating units and said adaptation units to provide for advancing the photographic material;

a plurality of control means connected independently relative to each other, and wherein each one of the plurality of control means is connected to the plurality of operating units and connected to the plurality of adaptation units for controlling the operation of the respective operating units and of the respective adaptation units in accordance with preestablished operating cycles and depending on the operational state of the other operating units and adaptation units disposed directly adjacent to a respective one of the plurality of operating units and of the plurality of adaptation units; first sensor means provided to said first adaptation unit and adapted to sense as coded information the quantity of photographic material which is provided from time to time within said temporary collecting means, wherein said first sensor means is controlled by said control means associated with the first adaptation unit in such a way as to influence a predetermined first powered means of the plurality of powered means of the operating unit preceding the first adaptation unit and a predetermined second powered means of the plurality of powered means of the operating unit following to the first adaptation unit in a way to change or stop a rotation of the powered means of the first adaptation unit depending on the photographic material being provided within the first adaptation unit;

second sensor means provided to said second adaptation unit adapted to sense as coded information the quantity of photographic material which is provided from time to time within said temporary collecting means, wherein said second sensor means is controlled by said control means associated with the second adaptation unit in such a way as to influence a predetermined third powered means of the plurality of powered means of the operating unit preceding the second adaptation unit and of a predetermined fourth powered means of the plurality of powered means of the operating unit following to the second adaptation unit in a way to change or stop a rotation of the powered means of the second adaptation unit depending on the photographic material being provided within the second adaptation unit.

5,463,441

LEADER, METHODS FOR ATTACHING THE LEADER TO A FILM AND FOR DETACHING IT THEREFROM, AND DEVELOPING APPARATUS WITH AUTOMATIC ATTACHMENT AND DETACHMENT OF THE LEADER

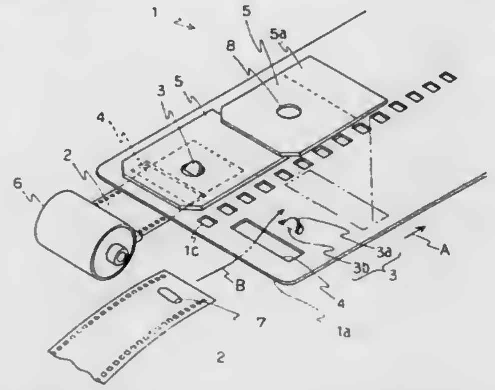
Takuji Yamaguchi, Wakayama, Japan, assignor to Noritsu Koku Co., Ltd., Wakayama, Japan

Filed Mar. 29, 1994, Ser. No. 219,473

Claims priority, application Japan, Apr. 15, 1993, 5-088843

Int. Cl.^{6} G03D ***3/08***

U.S. Cl. 354—321 **5 Claims**



1. A leader to be attached at one end portion thereof to a film having an engagement perforation in a leading end portion thereof, comprising:

(a) a leader body;

(b) a pawl formed adjacent one end of the leader body projecting from a surface of the leader body and having a tip inclined in a direction in which the leader is to be fed;

(c) an elongated opening formed intermediate the one end of the leader body and the pawl and having a length slightly larger than a width of the film, the opening having a longitudinal axis extending parallel to an edge of the one end of the leader body; and

(d) a pressing plate disposed on a surface of the leader body from which the pawl projects and being fixed to said surface on a side of the pawl which is opposite to that on which the elongated opening is formed, said pressing plate having a hole overlying and exposing the pawl, so as to allow the film inserted between the pressing plate and the leader body through the elongated opening to slide therebetween until the engagement perforation of the film engages the pawl.

5,463,442

INTERCHANGEABLE LENS UNIT FOR USE IN CAMERA SYSTEM

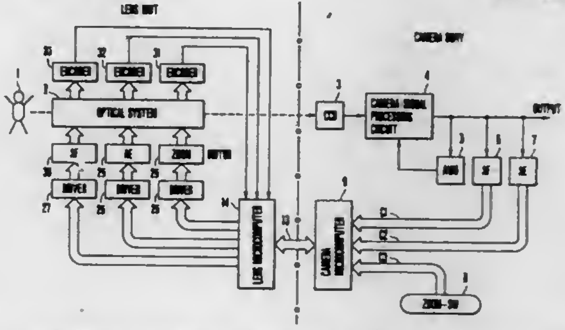
Isao Harigaya, Kanagawa; Hirokazu Mogi, Saitama; Susumu Kozuki, Tokyo; Ryunosuke Iijima, Kanagawa; Masamichi Toyama, Kanagawa, and Masahide Hirasawa, Kanagawa, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 556,957, Jul. 23, 1990, abandoned, which is a continuation of Ser. No. 399,176, Aug. 28, 1989, abandoned. This application Oct. 19, 1992, Ser. No. 963,005

Claims priority, application Japan, Aug. 31, 1988, 63-216929; Feb. 9, 1989, 1-032391

Int. Cl.^{6} G03B ***3/00;13/18***

U.S. Cl. 354—400 **63 Claims**



1. A lens unit detachably attached to a camera body comprising:

(a) driving means, in said lens unit, controlled and driven on the basis of control information supplied from a control circuit of the camera body;

(b) monitoring means, in said lens unit, for monitoring the driving state and a delay of driving operation of said driving means responsive to the control information and outputting an output signal in response to detecting of the delay of said driving operation; and

(c) output means, in said lens unit, for transmitting a specific signal for correcting a control operation of said camera body to said camera body in response to the output signal output from said monitoring means.

5,463,443

CAMERA FOR PREVENTING CAMERA SHAKE

Etsuo Tanaka, Tokyo; Tadao Kai, Kawasaki; Hiroshi Okano, Tokyo; Akira Katayama, Koganei, and Yoshio Imura, Kawasaki, all of, Japan, assignors to Nikon Corporation, Tokyo, Japan

Continuation of Ser. No. 24,760, Mar. 2, 1993, abandoned. This application Oct. 11, 1994, Ser. No. 321,466

Claims priority, application Japan, Mar. 6, 1992, 4-084434; May 13, 1992, 4-146997; Jul. 3, 1992, 4-200704

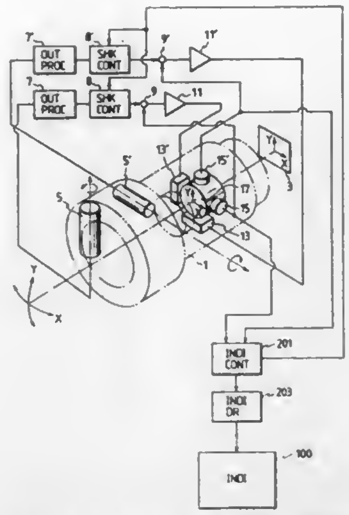
Int. Cl.^{6} G03B ***5/00;17/20***

U.S. Cl. 354—430 **124 Claims**

1. An anti-shake camera comprising:

a camera shake correction lens for correcting image blurring caused by a camera shake;

camera shake correction lens position detection means for detecting a displacement position of said camera shake correction lens with respect to a neutral position; and



indication means for indicating to a photographer, based on an output from said camera shake correction lens position detection means, a shaking direction of said camera so as to decrease a displacement amount of said camera shake correction lens from the neutral position.

5,463,444

HEAT DEVELOPMENT PROCESSOR WHEREIN STEAM IS DISCHARGED FROM A HEAT SENSITIVE MATERIAL

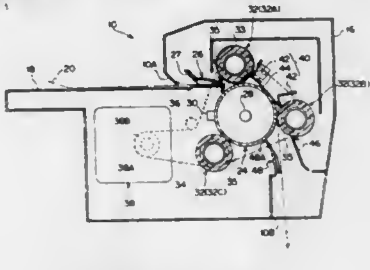
Naoki Watanabe; Hirokazu Okutsu; Masakazu Isozaki, and Kenji Inoue, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

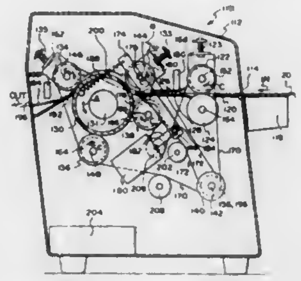
Filed Sep. 23, 1993, Ser. No. 125,654

Claims priority, application Japan, Sep. 24, 1992, 4-254790; Dec. 4, 1992, 4-325723; Dec. 4, 1992, 4-325725

Int. Cl.^{6} G03B *27/32;* H05B *1/00*

U.S. Cl. 355—27 **9 Claims**





1. A heat development processor comprising:

a heat roller whose peripheral surface is heated to a predetermined temperature, said heat roller being adapted to transport in close contact therewith a heat-developable light-sensitive material with a latent image formed thereon, so as to heat develop the heat-developable light-sensitive material; and

planar guiding means having a hydrophobic contact surface for guiding a leading end of the heat-developable light-sensitive material onto the peripheral portion of said heat roller by coming into contact with the heat-developable light-sensitive material and for bringing the heat-developable light-sensitive material into close contact with said heat roller.

5,463,445

METHOD AND APPARATUS FOR IMAGE PHOTOMETERING

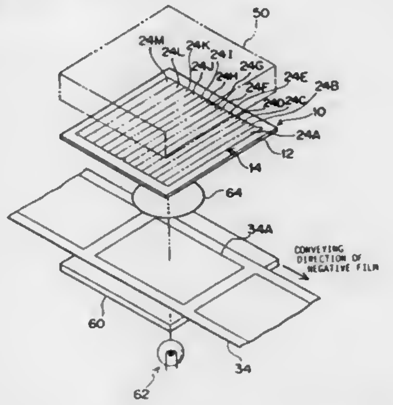
Kenji Suzuki, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 974,522, Nov. 12, 1992, abandoned. This application Aug. 5, 1994, Ser. No. 286,789

Claims priority, application Japan, Nov. 13, 1991, 3-297275

Int. Cl.^{6} G03B *27/80*

U.S. Cl. 355—71 **11 Claims**



1. A method of photometering an image, comprising the steps of:

irradiating light onto an image recorded on a film;

causing the light to pass through said image incident onto a spectral filter composed of a plurality of interference filter sections which are arranged along one direction and each of which selects a certain wavelength range of light having a different wavelength as the center thereof;

photometering light waves after passing through respective pixels and being selected by said interference filter sections, for each pixel of said image, with respect to each of the light waves having different wavelength ranges while relative movement between said interference filter and said film is effected in said one direction; and

effecting irradiation of light on said film on a stage having an opening through which the light passes, said opening being divided along said one direction into a number of divisions equal to the plurality of interference filter sections, said spectral filter being optically arranged such that each of light waves which pass through different divisions of said opening is made incident on respective interference filter sections, photometering being effected by a photometer comprising a plurality of photosensors arranged in two dimensions so that during one photometering step, light intensity data at different wavelengths being obtained for all of the pixels corresponding to said opening, and while moving said film forward onto said opening in said one direction by the width of a division of said divided opening as a unit, light transmitted through pixels of said film present in each division and passing through an interference filter section optically corresponding to the division being measured for light intensity so as to measure the transmission light intensity with respect to each of said wavelength ranges for each pixel on said film.

5,463,446

ROTARY MEMBER A PROCESS CARTRIDGE AND AN ASSEMBLING METHOD FOR ROLLING MEMBERS

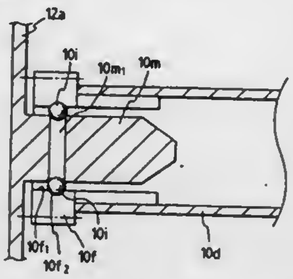
Kazushi Watanabe, Yokohama; Shinichi Sasaki, Fujisawa; Isao Ikemoto, Kawasaki; Shigeo Miyabe, Yokohama, and Shinya Noda, Yokohama, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 29, 1993, Ser. No. 174,809

Claims priority, application Japan, May 20, 1993, 5-118518; Jul. 14, 1993, 5-174118; Nov. 30, 1993, 5-299914

Int. Cl.^{6} G03G *15/00*

U.S. Cl. 355—200 **17 Claims**



1. A process cartridge mountable onto an image forming apparatus, said process cartridge comprising:
   - a rotary member;
   - a holding member for holding said rotary member; and
   - a plurality of rolling members assembled between said rotary member and said holding member independently from said holding member,
   - wherein said plurality of rolling members is engaged by a continuous groove formed on an inner peripheral surface of an end flange of said rotary member along a rotational direction of said rotary member, and by a plurality of recesses formed on an outer peripheral surface of a shaft protruded from a cartridge frame for supporting said rotary member.

5,463,447

DEVICE FOR REMOVING A TONER FROM A TONER IMAGE CARRIER

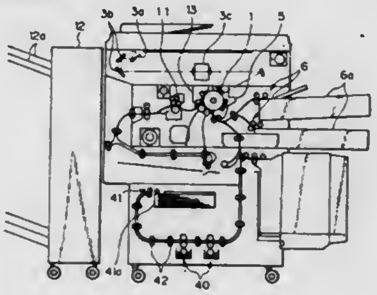
Tsuneo Kurotori, Tokyo; Katsuhiro Echigo, Asaki; Mitsuaki Urakawa, Yokohama; Hisamitsu Mizuno, Tokyo, and Kunio Hibi, Yokohama, all of, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

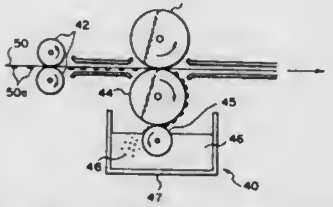
Filed Sep. 7, 1993, Ser. No. 117,289

Claims priority, application Japan, Sep. 7, 1992, 4-265434

Int. Cl.^{6} G03G *21/00*

U.S. Cl. 355—202 **21 Claims**





1. In a device for forming a toner image on a toner image carrier sheet, the improvement comprising:

means for removing a toner formed on the toner image carrier sheet, comprising,
   - a toner image removing member for transporting a liquid having a predetermined toner removal characteristic, on a toner image removing member surface of said toner image removing member, to the toner image carrier sheet,
   - means for moving the toner image removing member surface relative to a surface of said toner image carrier sheet, when said toner image carrier sheet and said toner image removing member are positioned relative to one another, such that said toner image removing member supplies said liquid to said surface of said toner image carrier sheet, and
   - means for moving said surface of said toner image removing member at a higher speed and in the same direction as said toner image carrier sheet.

5,463,448

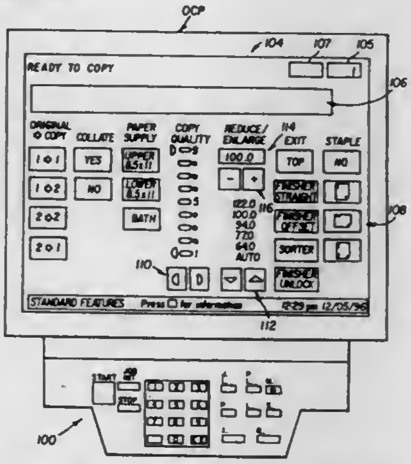
REPRODUCTION APPARATUS HAVING MULTIPLE WAYS OF ENTERING AN INFORMATION SYSTEM

James Wilson, Coral Springs, Fla., and Frederick E. Altrieth, Scottsville, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 19, 1994, Ser. No. 229,892

Int. Cl.^{6} G03G *21/00*

U.S. Cl. 355—202 **3 Claims**



1. In reproduction apparatus having a plurality of selectable features for carrying out a reproduction run, an operator control panel for controlling said reproduction apparatus comprising:
   - a plurality of operator selectable "hard" buttons for providing input to and control of said reproduction apparatus;
   - a display for displaying selectable features for a reproduction run and for displaying messages;
   - a touchscreen overlaying at least a part of said display, having operator selectable "soft" buttons and areas for providing operator input to said reproduction apparatus; and
   - an information system stored in said reproduction apparatus, said information system being accessible either by one of said plurality of operator selectable hard buttons or by an operator selectable soft button or area of said touchscreen;
   - wherein said touchscreen displays a plurality of soft buttons for controlling features of said reproduction apparatus, wherein at least one of said features is locked out to the operator, and wherein operator touching of said locked out soft button accesses the information system and displays information about the feature which is locked out.

5,463,449

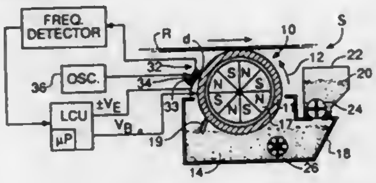
REDUCTION IN METALLIZATION OF A PIEZOELECTRIC SENSOR FOR A XEROGRAPHIC DEVELOPMENT PROCESS TO INCREASE SENSITIVITY OF THE SENSOR

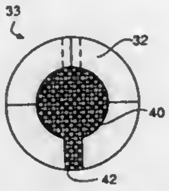
Theodore H. Morse, Rochester; Donald S. Rimai, Webster; Martin Potucek, and Sven Sonnenberg, both of Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 15, 1993, Ser. No. 167,674

Int. Cl.⁶ G03G ***15/08***

U.S. Cl. 355—203 **12 Claims**





1. In an electrostatographic recording device in which latent electrostatic images on an image-recording element are developed by a toner applicator which operates to apply a mass of electrostatically charged toner particles to the image-bearing surface of the image-recording element, said toner applicator being electrically biased to a predetermined potential, an apparatus for determining the rate at which toner particles are applied to the image recording, said apparatus comprising:

a piezo device having a first metallized surface and a second metallized surface, the second metallized surface opposed to the first metallized surface and positioned with said second metallized surface adjacent to said toner applicator to attract a mass of toner particles;

means for selectively biasing said piezo device to a predetermined potential to cause a monolayer of toner particles to be deposited on said second metallized surface; and

means for selectively sensing the rate of toner deposition on said second surface by repeatedly sensing the change in resonant impedance of said piezo device,

wherein the area of the first metallized surface is greater than the area of the second metallized surface thereby increasing the sensitivity to the mass of the toner particles deposited on the piezo device.

5,463,450

CHARGING DEVICE FOR APPLYING AN OSCILLATING VOLTAGE TO A MEMBER TO BE CHARGED

Takahiro Inoue; Masahiro Goto; Hiroshi Sasame, all of Yokohama; Shinichi Tsukida, Okegawa, and Manabu Takano, Tokyo, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 921,763, Jul. 30, 1992. This application Apr. 21, 1994, Ser. No. 232,433

Claims priority, application Japan, Jul. 31, 1991, 3-192041

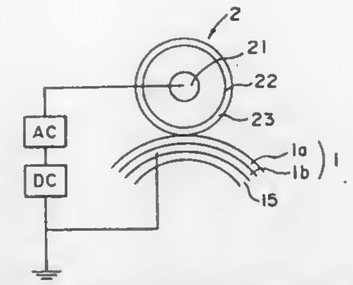
Int. Cl.⁶ G03G ***15/02***

U.S. Cl. 355—219 **20 Claims**

1. A charging apparatus for charging a member to be charged including a charge bearing member and a core member inside thereof, said apparatus comprising:

a charging member contactable to the member to be charged to electrically charge a surface thereof;

voltage applying means for applying an oscillating voltage between the member to be charged and said charging member;



wherein a frequency f (Hz) of the oscillating voltage, a Young's modulus of said charge bearing member E_1(N/m^2), a Young's modulus of the core member E_2(N/m^2), an outer circumferential length L(m) of the member to be charged, a thickness t1(m) of the charge bearing member, and a thickness t2(m) of the core member, satisfy:

if $L^2/(E_1t_1^3+E_2t_2^3) \leqq 1.5\times10^{-2}/1500$, $f>200$; and

if $L_2/(E_1t_1^3+E_2t_2^3)<1.5\times10^{-2}/1500$, $f<(E_1t_1^3+E_2t_2^3)/L^2 1.5\times10^{-2}$ and $200>f \geqq$ and 1500.

5,463,451

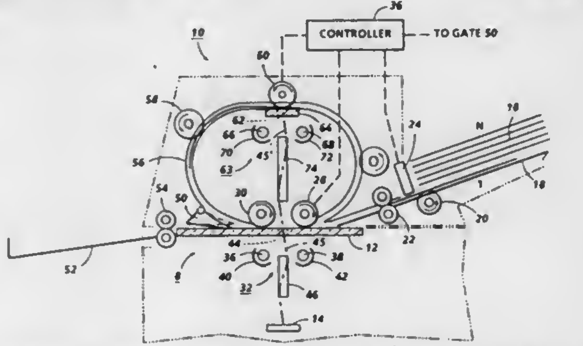
DOCUMENT REPRODUCTION SYSTEM INCLUDING A DUPLEX DOCUMENT HANDLER WITH NATURAL INVERSION

Thomas Acquaviva, Penfield; James D. Rees, Pittsford; Paul F. Morgan, Rochester, and Joseph J. Ferrara, Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 15, 1994, Ser. No. 340,002

Int. Cl.⁶ G03G ***15/04;15/23***

U.S. Cl. 355—233 **19 Claims**



1. In a document reproduction system for imaging both sides of duplex documents and for additionally imaging simplex documents, said document reproduction system including an automatic document feeding and imaging system for scanning both sides of document sheets and for projecting line images of the scanned document sides onto a light sensitive imaging member, said document feeding and imaging system comprising, in combination,

a first object plane,

a first scanning station positioned beneath said first object plane for scanning a first side of the document, said first scanning station including a first illumination system to illuminate a first exposure zone in said first object plane and further including a first lens system for projecting light reflected from said documents moving through said exposure zone as focused line images along a first optical path onto said light sensitive image member,

a second object plane,

a second scanning station positioned beneath said second object plane for scanning a second side of the document, said second scanning station including a second illumination system to illuminate a second exposure zone in said second object plane and further including a second lens system for projecting light reflected from documents moving through said second exposure zone along a second optical path superimposed with said first optical path onto said light sensitive member, a document feeding and control system for selectively feeding documents to be imaged at one of said first and second scanning stations in a simplex document mode of operation and through both said first and second scanning stations in a duplex document mode of operation, said control system selectively actuating said first and second illumination systems in response to said selected mode of operation.

5,463,452

SINGLE-COMPONENT DEVELOPING APPARATUS

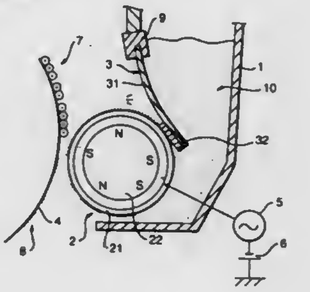
Shigeru Inaba; Masaaki Fukuhara; Makoto Hirota; Mitsuo Yamamoto; Jun Abe; Hideaki Miyata; Takayuki Sunaga; Toru Ishikawa; Yoshio Shiina; Toru Isosu, and Makoto Kanno, all of Ebina, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

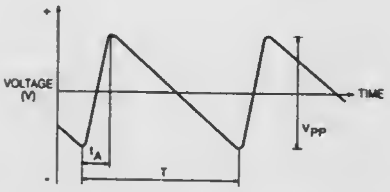
Continuation of Ser. No. 830,568, Feb. 4, 1992, abandoned. This application Feb. 14, 1994, Ser. No. 195,049

Claims priority, application Japan, Feb. 5, 1991, 3-035247

Int. Cl.^{6} G03G *21/00*

U.S. Cl. 355—246 **12 Claims**





1. A single-component developing apparatus comprising:

a developer holding member having a magnetic member therein and a peripheral surface;

power supply means for applying an AC developing bias voltage to the developer holding member, said AC developing bias voltage having a waveform with predetermined minimum value, maximum value and period, said AC developing bias voltage rising gradually from said minimum value to said maximum value and falling gradually from said maximum value to said minimum value;

an electrostatic latent image receiving member opposing the developer holding member across a gap having predetermined width;

developer supplying means for supplying a developer to the developer holding member; and

a developer regulating member in pressing engagement with the developer holding member, forming the developer into a thin layer on the peripheral surface of the developer holding member,

wherein the developer holding member transports the thin layer of developer towards the electrostatic latent image receiving member,

wherein the transported thin layer of developer flies from the developer holding member across the gap to the electrostatic latent image receiving member in accordance with the AC developing bias voltage,

wherein the waveform of the AC developing bias voltage satisfies the inequality:

$$T_A/T \geqq .4$$

wherein t_A is rise time from the minimum value to the maximum value, and T is the period.

5,463,453

WET-TYPE IMAGE FORMATION APPARATUS

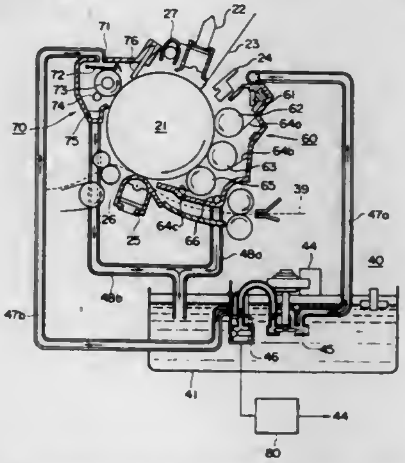
Tsuneo Kurotori, Tokyo; Manabu Mochizuki; Kenzo Ariyama, both of Yokohama; Kenji Kojima; Ichiro Tsuruoka, both of Tokyo; Katsuhiro Echigo, Yokohama; Mayumi Miyao, Tokyo, and Itsuo Ikeda, Sagamihara, all of, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Division of Ser. No. 569,931, Aug. 20, 1990, abandoned. This application Jan. 15, 1993, Ser. No. 6,179

Claims priority, application Japan, Aug. 9, 1989, 1-204579; Aug. 9, 1989, 1-204581; Aug. 26, 1989, 1-218891; Jan. 4, 1989, 1-259078; Jan. 4, 1989, 1-259079; Jan. 4, 1989, 1-259080; Jan. 4, 1989, 1-259081

Int. Cl.^{6} G03G *15/10;15/11*

U.S. Cl. 355—256 **22 Claims**



1. A wet-type image formation apparatus comprising:

a latent electrostatic image formation means capable of forming on a latent-electrostatic-image-bearable photo-conductive member a latent electrostatic image corresponding to an original image; and

a wet-type development means capable of developing said latent electrostatic image into a visible toner image with a liquid developer which comprises (i) a carrier liquid comprising a petroleum aliphatic hydrocarbon and a silicone oil with a siloxane structure, said silicone oil being contained in said carrier liquid in an amount in a range of 50 vol.% to less than 100 vol.% of the entire volume of said carrier liquid;, and (ii) toner particles comprising a coloring agent and a binder resin, which are dispersed in said carrier liquid, wherein said wet-type development means comprises (a) a liquid developer reservoir holding a quantity of said liquid developer, (b) a development roller means which supplies said liquid developer to a development section of said photoconductive member, and (c) a liquid developer supply means for supplying said liquid developer to said development roller means.

5,463,454
METHOD OF FORMING FIXED IMAGES USING ENCAPSULATED TONER

Shin-ichiro Yasuda, Osaka; Kuniyasu Kawabe, and Mitsuhiro Sasaki, both of Wakayama, all of, Japan, assignors to KAO Corporation, Tokyo, Japan

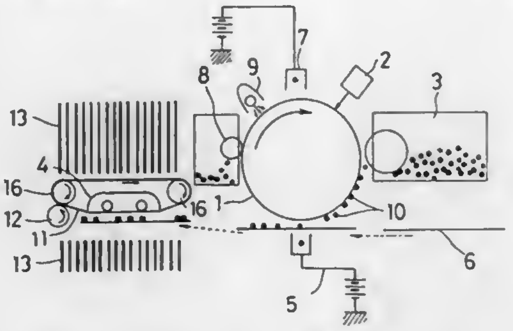
Continuation of Ser. No. 890,268, May 29, 1992, abandoned. This application Aug. 25, 1993, Ser. No. 111,739

Claims priority, application Japan, May 30, 1991, 3-155300; May 30, 1991, 3-155301

The portion of the term of this patent subsequent to Jun. 27, 2012, has been disclaimed.

Int. Cl.^{6} G03G *15/20*

U.S. Cl. 355—290 **9 Claims**



1. A method of forming a fixed image utilizing an encapsulated toner the shell of which becomes fragile upon exposure to heat within a temperature range of not less than 40° C. and not more than 120° C. and is ruptured upon pressing of the toner at a nip pressure of less than 4 kg/cm, so as to form a fixed image, comprising:

uniformly charging a photoconductor;

selectively exposing said photoconductor to light to form an electrostatic latent image;

providing an encapsulated toner having a shell which becomes fragile upon exposure to heat within a temperature range of not less than 40° C. and not more than 120° C.;

applying said encapsulated toner to said electrostatic latent image formed on said photoconductor, thereby developing said electrostatic latent image to form a visible toner image;

transferring said formed visible toner image to a recording medium; and

fixing said transferred visible toner image onto said recording medium at a temperature of not less than 40° C. and not more than 120° C. by a fixing roller exerting a nip pressure of less than 4 kg/cm, whereby said shell of said encapsulated toner becomes fragile upon exposure to said heat within said temperature range, and ruptures upon pressing of said toner onto said recording medium by said fixing roller.

5,463,455
METHOD AND APPARATUS FOR ADAPTIVE CLEANER BLADE LUBRICATION

Robert S. Pozniakas, Rochester, and Gary A. Minagawa, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 6, 1993, Ser. No. 161,611

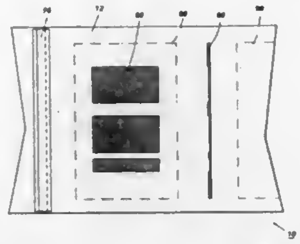
Int. Cl.^{6} G03G *21/00*

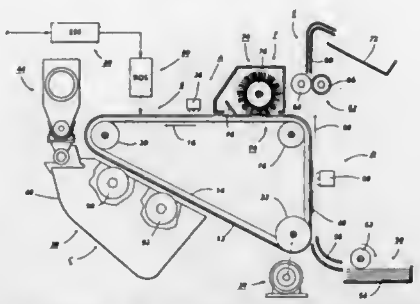
U.S. Cl. 355—299 **8 Claims**

1. An apparatus for adaptive cleaner blade lubrication in a disturber brush/primary blade cleaner comprising:

a photoreceptive member having a number of pixels to be developed thereon to form an image;

a controller, which determines image density as a function of the number of pixels to be developed on said photoreceptive member in a process direction and calculates an amount of toner required to properly lubricate the cleaner blade; and means for depositing the quantity of toner on said photoreceptive member in a direction transverse to a process direction so as to maintain the disturber brush in a toned condition so as to provide cleaner blade lubrication.





5,463,456
CLEANING ASSISTANT USED WITH A PHOTOSENSITIVE DRUM UNIT FOR LOWERING CHARGE MEMORY

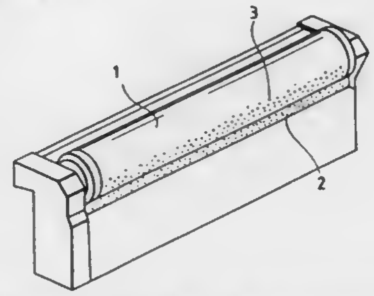
Yuichi Yashiki; Masahiko Hondumi; Yuzuru Ohki; Takashi Ito; Fumitaka Nakjajima; Masakazu Mori; Takayoshi Aoki; Harumitsu Mizuishi, and Yuusaku Shibuya, all of Minamiashigara, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Jun. 3, 1994, Ser. No. 253,286

Claims priority, application Japan, Jun. 4, 1993, 5-158141; Feb. 2, 1994, 6-029180

Int. Cl.^{6} G03G *21/00*

U.S. Cl. 355—299 **4 Claims**



1. A photosensitive drum unit for an electrophotographic apparatus of the type of contacting a cleaning blade to a photosensitive drum, wherein a lubricating layer comprising a cleaning assistant composed of a lubricant capable of lowering the frictionally charged potential of the photosensitive drum caused by the friction of the photosensitive drum and the cleaning blade to less than or equal to 100 V is attached to the surface of the photosensitive drum, the cleaning blade or to both, and the lubricant is powder of an alkylenebisstearylamide or a polymethacrylic acid ester.

5,463,457

IMAGE FORMING APPARATUS CAPABLE OF CHANGING IMAGE FORMING CONDITIONS DEPENDING ON SIDE OF RECORDING MATERIAL

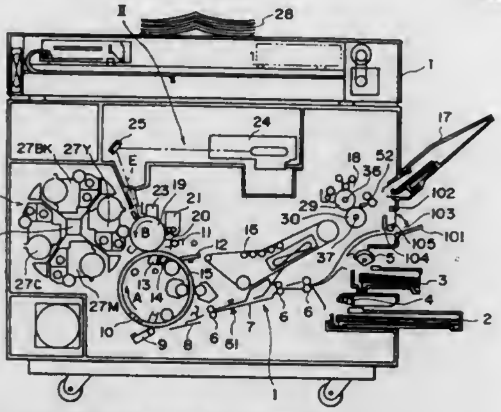
Tatsuo Takeuchi; Yasuo Nami, both of Kawasaki, and Jiro Ishizuka, Machida, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 28, 1993, Ser. No. 127,881

Claims priority, application Japan, Sep. 30, 1992, 4-285171

Int. Cl.^{6} G03G *21/00*

U.S. Cl. 355—313 **7 Claims**



1. An image forming apparatus comprising:

manual sheet feeding means for permitting a recording material to be manually fed;

image forming means for forming an image on the fed recording material;

double side mode selecting means for selecting a double side mode in which images are formed on both surfaces of the recording material;

wherein said image forming means is conditioned for forming images on both surfaces when said manual feeding means is in manual feeding state, the double side mode is selected by said double side mode selecting means and an image formation on a second side of the recording material is effected on the recording material fed by said manual sheet feeding means.

5,463,458

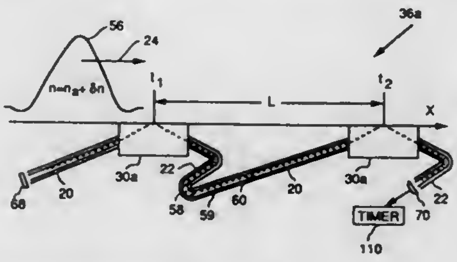
OPTICAL SENSOR FOR DUCT FAN DISCHARGE MACH NUMBERS

Ertugrul Berkcan, Niskayuna, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 16, 1993, Ser. No. 167,009

Int. Cl.^{6} G01P *3/36;* F02K *3/00*

U.S. Cl. 356—28 **22 Claims**



1. A pulse speed sensor, comprising:

two total internal reflection (TIR) detectors, each of said TIR detectors facing an area through which air can pass, said TIR detectors positioned so that air can pass over a first one of said TIR detectors prior to passing over a second one of said TIR detectors; and

means responsive to each of said TIR detectors for determining elapsed time for passage of an air pressure pulse between said TIR detectors.

5,463,459

METHOD AND APPARATUS FOR ANALYZING THE STATE OF GENERATION OF FOREIGN PARTICLES IN SEMICONDUCTOR FABRICATION PROCESS

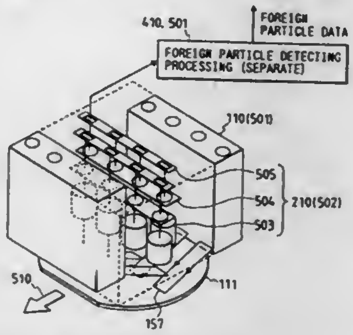
Hiroshi Morioka, Ebina; Minori Noguchi, Yokohama; Yoshimasa Ohshima, Yokohama; Yukio Kembo, Yokohama; Hidetoshi Nishiyama, Fujisawa; Kazuhiko Matsuoka, Gunma, and Yoshiharu Shigyo, Takasaki, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 679,317, Apr. 2, 1991, Pat. No. 5,233,191, and Ser. No. 778,363, Oct. 17, 1991, Pat. No. 5,274,434. This application Apr. 16, 1993, Ser. No. 46,720

Claims priority, application Japan, Apr. 17, 1992, 4-098095

Int. Cl.^{6} G01N *21/89;* G02B *27/46;* G06F *15/46*

U.S. Cl. 356—237 **39 Claims**



1. A defect detecting apparatus including:

an illumination system for radiating a light of a plane wave linearly to a substrate having repetitive patterns of different pitches;

a focusing optical system for focusing a light image reflected from the substrate thus illuminated by said illumination system radiating linear light;

a spatial filter disposed intermediate said focusing optical system so as to shield a diffraction light from repetitive patterns of a small pitch on the substrate;

a linear detection detector for detecting the light image obtained through said spatial filter and focused by said focusing optical system;

an erasing means for comparing and erasing signals which are generated on the basis of repetitive patterns of a large pitch and obtained through said spatial filter, out of signals detected by said detector; and

a defect detecting means for detecting defects on the substrate in accordance with a signal detected by said detector.

5,463,460

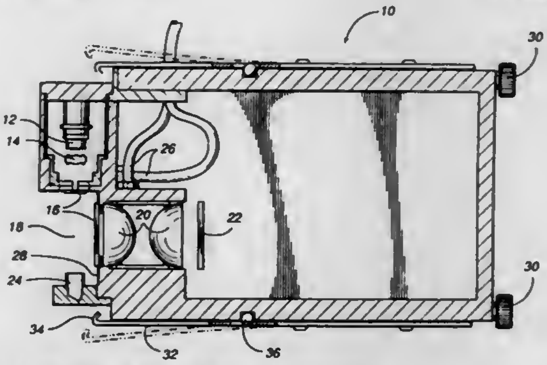
PARTICLE MONITORING SENSOR

Boris Fishkin, and Phil Salzman, both of San Jose, Calif., assignors to Applied Materials, Inc., Santa Clara, Calif.

Filed Jul. 8, 1993, Ser. No. 88,975

Int. Cl.^{6} G01N *21/85*

U.S. Cl. 356—339 **20 Claims**



1. A particle monitoring sensor comprising:

a linearly polarized laser, said linearly polarized laser emitting light which is polarized along a polarization axis, said light being directed toward a scattering region;

collection optics;

a detector, wherein said collection optics, said detector and at least a portion of said scattering region define an optical path; and

an elongated slit disposed along said optical path, said elongated slit being elongated along a slit axis substantially perpendicular to said polarization axis.

5,463,461

COHERENT OPTICAL RECEIVER HAVING OPTICALLY AMPLIFIED LOCAL OSCILLATOR SIGNAL

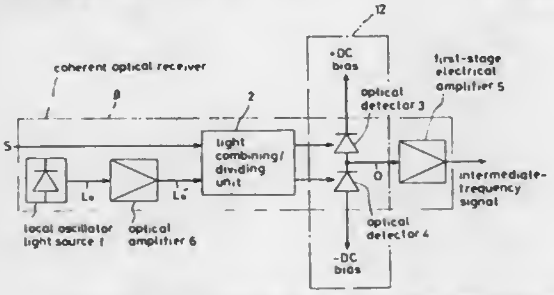
Yukio Horiuchi, Niiza, and Shiro Ryu, Tokyo, both of, Japan, assignors to Kokusai Denshin Denwa Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 844,039, Mar. 2, 1992, abandoned. This application Jan. 9, 1995, Ser. No. 369,992

Claims priority, application Japan, Mar. 6, 1991, 3-040283

Int. Cl.^{6} G01B *9/02*

U.S. Cl. 356—349 **14 Claims**


12
coherent optical receiver
8
2
+DC bias
first-stage electrical amplifier 5
optical detector 3
S
light combining/ dividing unit
Lo
Lo'
O
intermediate-frequency signal
local oscillator light source 1
optical amplifier 6
optical detector 4
-DC bias

1. A coherent optical receiver for coherent light detection, said receiver comprising:

local oscillator light source means for providing a local oscillator light,

optical amplifier means for amplifying only said local oscillator light,

light combining/dividing unit means for combining a non-amplified a signal light and said amplified local oscillator light and dividing said combined light into two divided lights,

a dual balanced receiver comprising two optical detector means for converting said two divided lights into electrical signals and for synthesizing said two electrical signals, and

electrical amplifier means for amplifying said synthesized electrical signal, wherein said light combining/dividing unit means and said dual balanced receiver further comprise two signal passage means for connecting between a common point of said combining/dividing unit means and a synthesis point of said dual balanced receiver.

5,463,462

METHOD OF AND APPARATUS FOR INSPECTING HONEYCOMB-SHAPED OBJECT HAVING PLURAL THROUGH HOLES

Takao Ohnishi, Niwa; Yukihisa Osugi, Nagoya, and Miyuki Muto, Obu, all of, Japan, assignors to NGK Insulators, Ltd., Japan

Filed Mar. 29, 1994, Ser. No. 219,381

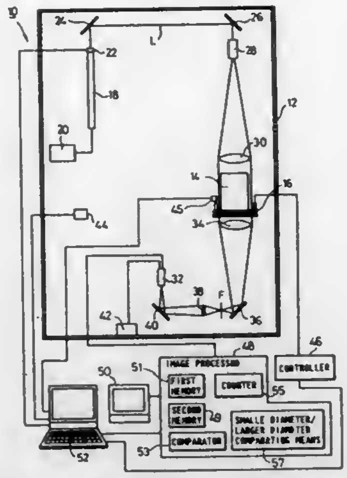
Claims priority, application Japan, Mar. 31, 1993, 5-074516

Int. Cl.^{6} G01B *9/02*

U.S. Cl. 356—354 **13 Claims**

1. A method of inspecting a honeycomb-shaped object having a plurality of through holes defined therein by partitions, comprising the steps of:

introducing a parallel light beam into the through holes at an angle with respect to an axis of the through holes;



generating at least one Fourier-transform image from the honeycomb-shaped object by passing light through the honeycomb-shaped object; and

determining whether there are interstices in the partitions based on the at least one Fourier-transform image, by observing whether said at least one Fourier-transform image includes a Fourier-transform image of interstices in the partitions, which includes a pattern of periodic images, said periodic images including equidistantly spaced parallel stripes.

5,463,463

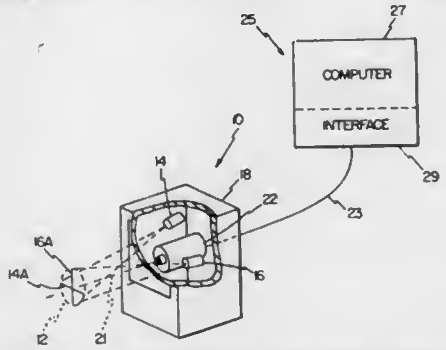
OPTICAL MOTION SENSOR

Dennis N. Harvey, Victoria, and Randal L. Jenniges, Bloomington, both of Minn., assignors to MTS System Corporation, Eden Prairie, Minn.

Filed Jan. 25, 1994, Ser. No. 186,310

Int. Cl.^{6} G01B *11/14*

U.S. Cl. 356—375 **29 Claims**



1. An apparatus for determining a position of an object moving within a region with respect to a reference coordinate system, the object having a surface with a first pattern thereon, the apparatus comprising:

projection means for projecting a second pattern upon the surface of the object;

sensing means for sensing an image of the region, said image constituting a fixed defined portion of the region and including an image of the first pattern and an image of the second pattern and for providing an image signal representing the fixed defined portion of the region; and

analyzing means operably coupled to the sensing means for receiving the image signal, the analyzing means analyzing the image signal to detect positional changes of the image of the first pattern in the image of the fixed defined portion of the region and to detect positional changes of the image of the second pattern in the image of the fixed defined portion of the region and to calculate the position of the object in the region as a function of a position of the image of the first pattern in the image of the fixed defined portion of the region and a position of the image of the second pattern in the image of the fixed defined portion of the region.

5,463,464

ELECTRO-OPTICAL SYSTEM FOR GAUGING SURFACE PROFILE DEVIATIONS USING INFRARED RADIATION

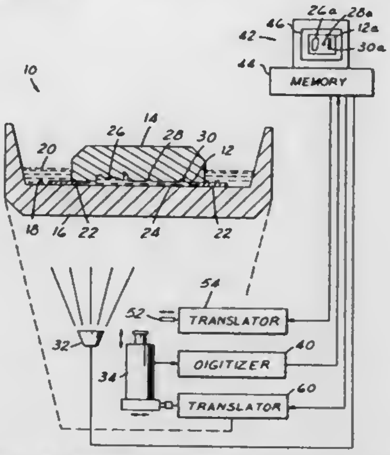
Theodore B. Ladewski, Ann Arbor, Mich., assignor to KMS Fusion, Inc., Ann Arbor, Mich.

Continuation-in-part of Ser. No. 770,885, Oct. 4, 1991, Pat. No. 5,289,267. This application Oct. 13, 1993, Ser. No. 136,229

The portion of the term of this patent subsequent to Feb. 22, 2011, has been disclaimed.

Int. Cl.^{6} G01B *11/00;* **G01J** *1/02*

U.S. Cl. 356—376 **25 Claims**



1. A system for gauging the surface geometry of a test object using radiation that is naturally emitted from the test object, comprising:

means for sensing an image of the radiation emitted from the test object;

an attenuating medium disposed between the test object and said sensing means such that the radiation emitted from the test object travels through said attenuating medium prior to being received by said sensing means, whereby the intensity of said received radiation varies across the image as a function of the test object surface geometry; and

means for correcting optically generated errors in said image.

5,463,465

APPARATUS FOR EXAMINING THE EXTERNAL APPEARANCE OF SOLID ARTICLES

Taizo Yamamoto, Osaka; Hirokazu Konishi, Sakurai; Yoshihisa Kawaguchi, Kashihara, and Akira Nagao, Tenri, all of, Japan, assignors to Japan Elanco Company Limited, Osaka, Japan

Filed Jul. 11, 1994, Ser. No. 272,571

Claims priority, application Japan, Jul. 16, 1993, 5-176407

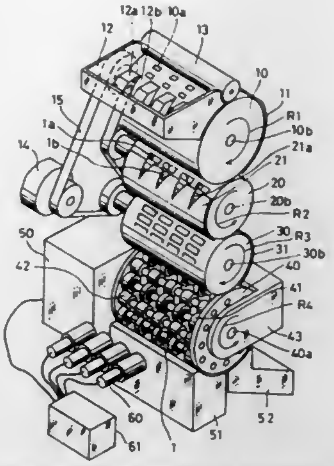
Int. Cl.^{6} G01B *11/00;* **G01N** *21/84;* **B07C** *5/00;5/342*

U.S. Cl. 356—394 **8 Claims**

1. An apparatus for examining the external appearance of solid articles, comprising: a hopper for containing said solid articles; an arranging apparatus for arranging said solid articles supplied from said hopper in a plurality of feeding lines, said solid articles arranged in a horizontal direction;

an examination drum which is intermittently rotated in a predetermined direction around a horizontal axis in a vertical plane;

a plurality of sets of first and second examination rollers rotatably borne on said examination drum in a vicinity of an outer periphery of said examination drum in a manner so that rotation axes of said first and second examination rollers are disposed on a circle which is coaxial with a rotation axis of said examination drum, one of said first and second examination rollers having same number of positioning parts as said feeding lines of said solid articles, a direction of rotation of both of said first and second examination rollers being the same, and a direction of rotation of said solid articles held in said positioning parts being opposite to said direction of rotation of said first and second examination rollers, said plurality of sets of first and second examination rollers are revolved along said circle by the rotation of said examination drum; and



at least one image pick-up device disposed in the vicinity of the outer periphery of said examination drum, said image pick-up device picking-up images of outer surfaces of said solid articles held in said positioning parts between said first and second examination rollers.

5,463,466

APPARATUS FOR ANALYZING OPTICAL PROPERTIES OF TRANSPARENT OBJECTS

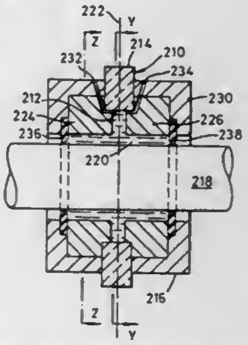
David A. Svendsen, St. Giles Hill, United Kingdom, assignor to York Technology Limited, Hants, United Kingdom

Continuation of Ser. No. 940,908, Nov. 3, 1992, abandoned. This application Feb. 22, 1995, Ser. No. 392,299

Claims priority, application United Kingdom, Apr. 4, 1990, 9010181

Int. Cl.^{6} G01N *21/47*

U.S. Cl. 356—440 **11 Claims**



1. Apparatus for analysing the optical properties of a transparent object, comprising

a light source,

an analyser cell which includes a body of solid transparent material having a cavity formed therein for receiving the object to be analysed, and arranged so as to allow a light beam from the light source to pass through the object, the body having an entrance surface through which the light beam enters the cell from an ambient medium and an exit surface through which the light beam leaves the cell, and

analysing means for analysing the light beam after passage through the object wherein the cavity in the analyser cell is of a substantially circular section in at least a first region through which the light beam passes in use, wherein at least one heat conductive ring member is provided in a second region within said cavity and wherein the ring member defines a central opening for receiving the object and substantially fills the second region except for the central opening.

5,463,467

LIGHT SOURCE PULSED WITH IRREGULAR PULSE SEQUENCE IN ANALOG PHOTOMETRIC SIGNAL EVALUATION FOR A TEST CARRIER ANALYSIS SYSTEM

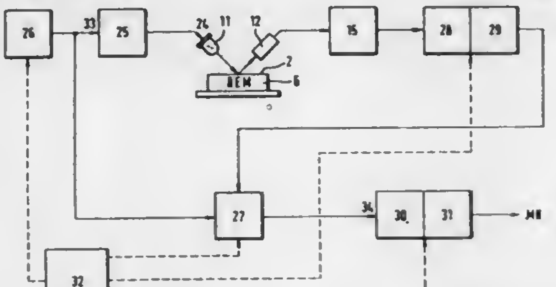
Edgar Baumann, Mannheim; Wolfgang Obermeier, and Karl Werner, both of Heidelberg, all of, Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Germany

Filed Jun. 27, 1994, Ser. No. 266,378

Claims priority, application Germany, Jun. 29, 1993, 43 21 548.3

Int. Cl.⁶ G01N *21/47*; **G01J** *1/44*

U.S. Cl. 356—446 **37 Claims**



20. An apparatus for detecting and evaluating analog photometric signals, said apparatus comprising:

light source means for irradiating a test field of a test carrier to be examined;

triggering means coupled to said light source means for triggering said light source means, said triggering means triggering said light source means in light-dark phases;

a pulse sequence generator coupled to said triggering means for generating a pulse sequence therefore;

measurement means for detecting and measuring light reflected by the test field, said measurement means comprises a measurement receiver generating measurement signals representing a measured value;

measurement integration and digitalization means coupled to said measurement means, said measurement integration and digitalization means measuring, integrating and digitalizing said measured value, wherein the pulse sequence generator is a random sequence generator generating an irregular pulse sequence.

5,463,468

DISPLAY UNIT HAVING A LIGHT-TO-LIGHT CONVERSION ELEMENT

Itsuo Takanashi, Kamakura; Shintaro Nakagaki, Miura; Ichiro Negishi; Tetsuji Suzuki, both of Yokosuka; Fujiko Tatsumi, Yokohama; Ryusaku Takahashi, and Keiichi Maeno, both of Yokosuka, all of, Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

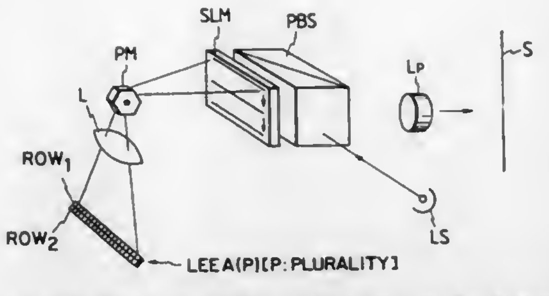
Continuation of Ser. No. 702,817, May 21, 1991, abandoned. This application Mar. 16, 1994, Ser. No. 216,232

Claims priority, application Japan, May 21, 1990, 2-130498; May 23, 1990, 2-134928; Jul. 20, 1990, 2-192358

Int. Cl.⁶ H04N *1/23*

U.S. Cl. 358—296 **7 Claims**

1. A display unit, comprising:



(a) a light-emitting element array composed of linearly arranged light-emitting elements of a number equal to that of picture elements forming a single straight line of an image to be displayed, said light-emitting elements being drivable to emit beams of light for predetermined periods of time at respective emission intensities modified simultaneously in accordance with pieces of information allotted to the picture elements on the single straight line of the image to be displayed;

(b) means for deflecting the light beams emitted from said light-emitting elements, simultaneously in a direction perpendicular to a longitudinal direction of said light-emitting element array to form a two-dimensional light pattern;

(c) a light-to-light conversion element including two electrodes of opposite polarities, a photoconductive layer, a mirror layer, and a photo-modulation layer disposed between said electrodes, said photoconductive layer forming an image when irradiated by the two-dimensional light pattern from the deflected light beams;

(d) a light source;

(e) means for directing light from said light source to the photo-modulation layer of said light-to-light conversion element as reading light;

(f) a screen; and

(g) focusing means for projecting the reading light which is modulated by the photo-modulation layer and reflected by the mirror layer according to the deflected light beams and focusing the reading light on said screen.

5,463,469

IMAGE PROCESSING APPARATUS CAPABLE OF DISCRIMINATING A PREDETERMINED IMAGE

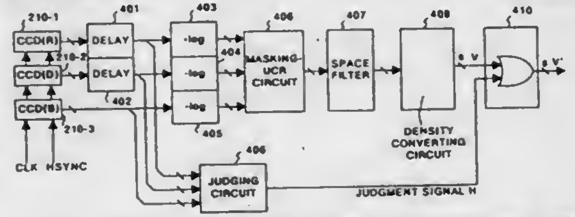
Masahiro Funada, Yokohama; Ken-ichi Ohta, Kawasaki; Yoichi Takaragi, Yokohama, and Eiji Ohta, Fujisawa, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 980,299, Nov. 23, 1992, abandoned, which is a division of Ser. No. 799,608, Nov. 27, 1991, Pat. No. 5,227,871. This application Mar. 13, 1995, Ser. No. 402,984

Claims priority, application Japan, Nov. 30, 1990, 2-330883; Nov. 30, 1990, 2-330884; Nov. 30, 1990, 2-330886; Nov. 30, 1990, 2-330888; Nov. 30, 1990, 2-330889; Nov. 30, 1990, 2-330890

Int. Cl.⁶ H04N *1/387;1/56;* **H04H** *5/00*

U.S. Cl. 358—296 **5 Claims**



1. An apparatus for controlling an image processing unit based on a content of an image, and supplying a control signal indicating whether a faithful output of the image should be prevented, comprising:

input means for inputting image data representing the image;

first discriminating means for discriminating whether the image represented by the input image data is a first predetermined image having a first color pattern, the first color pattern having a predetermined color located in a coordinate color space;

second discriminating means for discriminating whether the image represented by the input image data is a second predetermined image having a second color pattern, the second color pattern having a predetermined color located in the color coordinate space and different from the first color pattern; and

output means for combining discrimination results of said first discriminating means and said second discriminating means, and outputting the control signal so as to prevent the image processing unit from outputting a faithful output of the image;

wherein said first discriminating means and said second discriminating means perform respective discriminations in parallel.

5,463,470

METHODS OF COLLECTING PHOTOMETRIC IMAGE DATA AND DETERMINING LIGHT EXPOSURE BY EXTRACTING FEATURE IMAGE DATA FROM AN ORIGINAL IMAGE

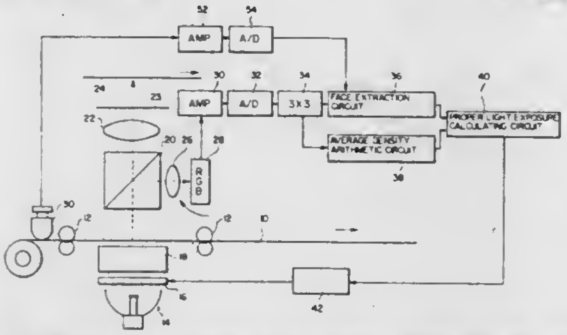
Takaaki Terashita, and Hiroaki Nakamura, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 8, 1992, Ser. No. 958,163

Claims priority, application Japan, Jan. 9, 1991, 3-262232; Jan. 9, 1991, 3-262233

Int. Cl.^{6} H04N *1/40;* G03F *3/08;* G06K *9/46*

U.S. Cl. 358—298 **19 Claims**



1. A method of determining light exposure comprising the steps of:

reading information in relation to a color original image and dividing said color original image into a plurality of picture elements to analyze respective ones of the picture elements with respect to three colors of light for photometry, said information in relation to said color original image being any one of size information representing a size of a main image and size related information for finding a size of said main image;

generating a histogram in relation to hue value depending upon data obtained from said photometry and dividing said histogram into portions each containing a crest of said histogram;

deciding to which of said crests said respective picture elements of said color original image belong so as to distribute each of said picture elements into a corresponding cluster, and analyzing said color original image for each cluster;

selecting a region of said color original image, which corresponds to said information, as a feature image region; and

determining said light exposure for copy material depending upon photometric image data obtained from said feature image region.

5,463,471

METHOD AND SYSTEM OF COLOR HALFTONE REPRODUCTION

Daniel S. Chou, Woodinville, Wash., assignor to Microsoft Corporation, Redmond, Wash.

Continuation of Ser. No. 879,959, May 6, 1992, abandoned. This application Sep. 16, 1994, Ser. No. 307,484

Int. Cl.^{6} H04N *1/40;1/46;1/52*

U.S. Cl. 358—298 **29 Claims**

	1	2	3	4	5	6	7	8
1	32	28 Y	19 YM	10 YMB	9 YMB	18 YM	27 Y	31
2	23 Y	15 YM	5 YMB	1 YMB	4 YMB	8 YMB	14 YM	22 Y
3	24 Y	16 YM	6 YMB	2 YMB	3 YMB	7 YMB	13 YM	21 Y
4	29	25 Y	20 YM	11 YMB	12 YMB	17 YM	26 Y	30

1. A method of color halftone reproduction for producing a selected image on a reproduction surface, comprising the steps of

(a) partitioning the reproduction surface into abutting halftone cells, each halftone cell being dimensioned to encompass an array of pels and including a center, said cells being grouped into rows that are organized such that the centers of said halftone cells in adjacent rows align at a common screen angle; and

(b) determining the magnitudes of a plurality of system colors to be applied in a selected halftone cell to reproduce a desired hue of the selected image at the area corresponding to said selected halftone cell; and

(c) creating a raster pattern in said selected halftone cell by applying the plurality of system colors in an overlapping fashion over portions of said selected halftone cell such that said portions depend upon the determined magnitudes of said system colors, and wherein the portion for one of the system colors completely encompasses the portion for another one of the system colors.

5,463,472

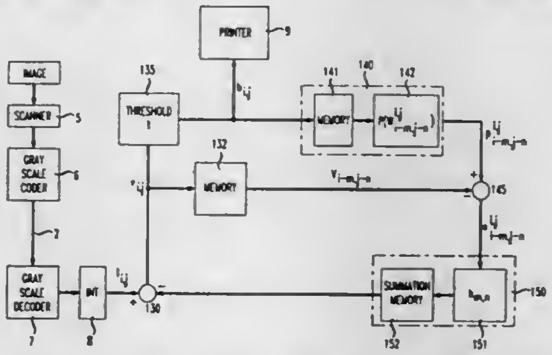
MODEL-BASED HALFTONING

David L. Neuhoff, Ann Arbor, Mich., and Thrasyvoulos N. Pappas, Summit, N.J., assignors to AT&T Corp., Murray Hill, N.J.

Continuation of Ser. No. 46,513, Apr. 12, 1993, which is a continuation of Ser. No. 659,753, Feb. 22, 1991, abandoned. This application Mar. 22, 1995, Ser. No. 408,454

Int. Cl.^{6} H04N *1/387;1/405*

U.S. Cl. 358—298 **18 Claims**



1. A method for generating an array of output binary signals suitable for application to a display device to generate a halftone image in response to an array of input signals characterizing a gray scale image, said method comprising the steps of:

in response to applied binary signals, forming past signals predictive of regions of halftone images formed by said display device, said past signal formed based on a model of said display device, modifying each of a plurality of said input signals in response to one or more past error signals, said past error signals reflecting differences between past modified input signals and said past signals predictive of regions of halftone images, and

forming a binary signal in response to each of a plurality of said modified input signals.

5,463,473

SIPHEN FOR CORRECTING A PULSE-WIDTH MODULATED SIGNAL IN A RECORDING APPARATUS

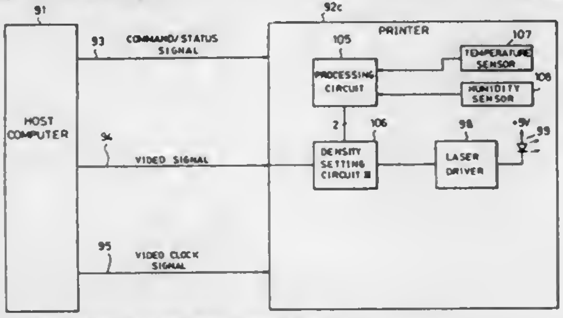
Hiromichi Yamada; Masaharu Ohkubo; Masaki Ojima; Hiroshi Sasame; Takashi Kawana; Kaoru Seto, all of Yokohama; Hiroshi Mano, Tokyo; Tetsuo Saito, Tokyo; Atsushi Kashihara, Tokyo, and Michio Ito, Tokyo, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 606,472, Oct. 30, 1990, abandoned. This application Jun. 2, 1993, Ser. No. 71,340

Claims priority, application Japan, Jan. 31, 1989, 1-282017; Dec. 4, 1989, 1-313387; Jan. 12, 1990, 2-003488

Int. Cl.^{6} H04N *1/40;* G01D *15/14;* G03G *21/00*

U.S. Cl. 358—300 **17 Claims**



1. A recording apparatus comprising:

input means for inputting a pulse-width-modulated signal sent from an external host device;

correction means for correcting a pulse-width of the pulse-width-modulated signal input by the input means;

detecting means for detecting an environmental condition inside of the recording apparatus, and for outputting a detection result; and

recording means for recording an image in accordance with the pulse-width-modulated signal corrected by said correction means;

wherein said correction means corrects the pulse-width of the pulse-width-modulated signal in accordance with the detection result output by said detecting means.

5,463,474

PILOT SIGNAL ELIMINATING CIRCUIT

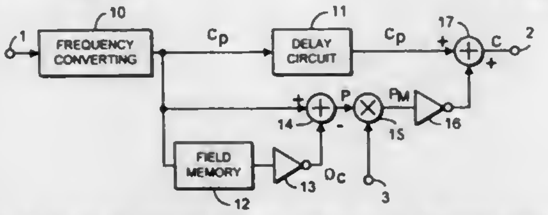
Shigeru Shimizu, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 83,193, Jun. 25, 1993, abandoned, which is a continuation of Ser. No. 695,898, May 6, 1991, abandoned. This application Aug. 22, 1994, Ser. No. 293,743

Claims priority, application Japan, May 9, 1990, 2-117470

Int. Cl.^{6} H04N *9/79*

U.S. Cl. 358—310 **4 Claims**



1. A circuit for eliminating pilot signals having different frequencies from one track to another adjacent track on a magnetic recording medium from chrominance signals on which said pilot signals have been superimposed and which have been changed to a lower frequency range, said circuit comprising:

a frequency converting circuit for converting to a higher frequency the frequency of said chrominance signals and said pilot signals superimposed thereon, said converting to a higher frequency reducing the relative frequency differences among said pilot signals;

a field memory directly responsive to an output signal of said frequency converting circuit to produce a delayed output signal in which said chrominance signals are phase inverted relative to said pilot signals;

an inverter for inverting said delayed output signal;

a first subtractor directly responsive to said output signal of said frequency converting circuit and said inverted, delayed output signal for subtracting said inverted, delayed output signal, which contains both chrominance signals and pilot signals, from an undelayed output of said frequency converting circuit, which also contains both chrominance signals and pilot signals, to eliminate said chrominance signals and isolate said pilot signals;

a separate delay circuit in parallel with said field memory, inverter and subtractor for delaying said output signal of said frequency converting circuit by an amount compensating for a delay of said field memory, inverter and subtractor; and

a second subtractor for subtracting an output of said first subtractor, which contains only pilot signals, from an output of said separate delay circuit, which contains both chrominance signals and pilot signals, to produce a final output containing only chrominance signals.

5,463,475

SEMICONDUCTOR DELAY LINE DRIVEN BY AN INPUT SIGNAL-DERIVED REFERENCE SIGNAL

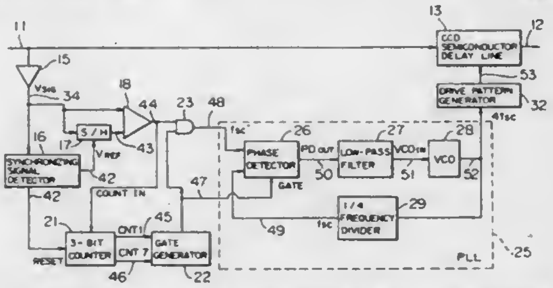
Tetsuo Nishikawa, Miyagi, and Tatsuya Hagiwara, Miyagi, both of, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 2, 1992, Ser. No. 939,739

Claims priority, application Japan, Sep. 13, 1991, 3-235156

Int. Cl.^{6} H04N *5/95;5/89*

U.S. Cl. 358—325 **7 Claims**



1. A method of driving a semiconductor delay line comprising the steps of:

inputting a television signal and deriving an intermittent reference signal from a color burst signal of said television signal;

generating a continuous reference signal from said intermittent reference signal; and

driving a CCD semiconductor delay line by using said continuous reference signal, and delaying said television signal;

wherein said step of deriving said intermittent reference signal includes a step of detecting a synchronizing signal of said television signal, holding a level of a pedestal signal of said television signal based on the detected synchronizing signal, comparing a level of said color burst signal with a level of said pedestal signal, and generating a predetermined number of synchronous pulses.

5,463,476

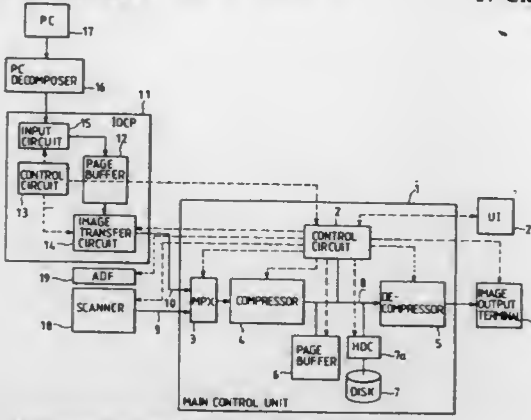
IMAGE PROCESSING SYSTEM

Kazuhiro Oya, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Oct. 10, 1990, Ser. No. 597,257

Int. Cl.^{6} H04N *1/41*

U.S. Cl. 358—426 **17 Claims**



1. An image processing system comprising:
means for receiving image data;
means for selectively compressing said image data;
means for selectively storing the compressed image data;
means for selectively decompressing the compressed image data back into its original form;
means for printing an image of said image data; and
control means for controlling the operation of said means for selectively compressing, storing, and decompressing, in either of two modes, a processing mode in which the image data is compressed by said compressing means, stored in said storing means, and decompressed by said decompressing means, and a through mode in which the image data bypasses said compressing means, said storing means, and said decompressing means, one of said two modes being selected based on the number of original documents bearing said image data, the number of copies of the original documents requested by a user, and whether editing is to be performed on said image data.

5,463,477

MOBILE COMMUNICATION METHOD AND MOBILE COMMUNICATION SYSTEM FOR DELETING FILL CODE IN RADIO CIRCUIT

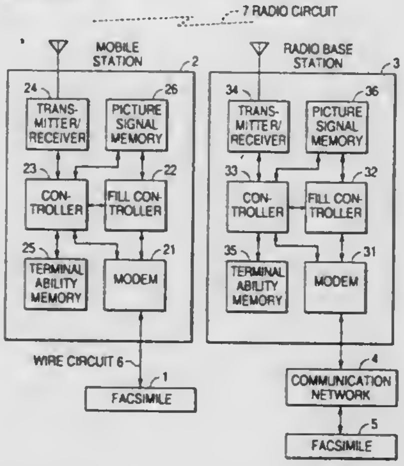
Akemi Kakizaki, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed May 20, 1994, Ser. No. 247,079

Claims priority, application Japan, May 21, 1993, 5-119921

Int. Cl.^{6} H04N *1/32*

U.S. Cl. 358—431 **7 Claims**



1. A mobile communication method in a mobile communication system for transmitting and receiving a picture signal between a facsimile apparatus connected to a radio base station and a facsimile apparatus connected to a mobile station through a radio circuit between the radio base station and the mobile station, comprising the steps of:
deleting a fill code from a picture signal to be transmitted from each of the radio base station and the mobile station to the radio circuit;
inserting a fill code into a picture signal received from the radio circuit by each of the radio base station and the mobile station so as to match a minimum scan line time of the facsimile apparatus connected thereto; and
transmitting the picture signal with the fill code inserted therein to the facsimile apparatus.

5,463,478

IMAGE PROCESSING METHOD AND APPARATUS

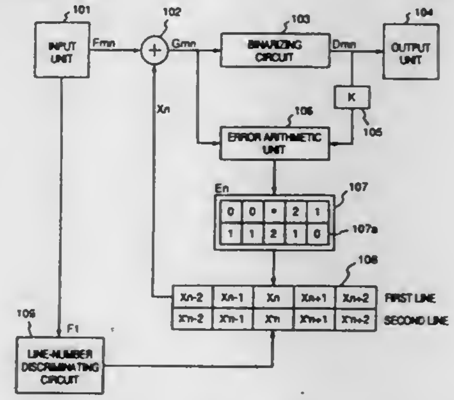
Takeshi Makita, Yokohama; Susumu Sugiura, Atsugi, and Osamu Yamada, Yokohama, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 17, 1994, Ser. No. 243,929

Claims priority, application Japan, May 24, 1993, 5-121211

Int. Cl.^{6} H04N *1/405;1/409*

U.S. Cl. 358—455 **12 Claims**



1. An image processing apparatus comprising:
input means for entering pixel data constituting image data and containing noise components;
accumulating means for accumulating an error, which is produced when the pixel data is subjected to a level-number transformation, as error data for distributing the error to a plurality of items of pixel data not yet processed;
transforming means for performing transformation of the number of levels of the pixel data based upon the entered pixel data and the error data accumulated by said accumulating means; and
updating means for updating the error data, which has been accumulated by said accumulating means, based on error data produced by the transformation performed in said transforming means;
wherein said updating means resets the error data accumulated by said accumulating means without updating the error data when a prescribed amount of the pixel data has been transformed by said transforming means, whereby an increase of noise components is prevented.

5,463,479

IMAGE FORMING APPARATUS

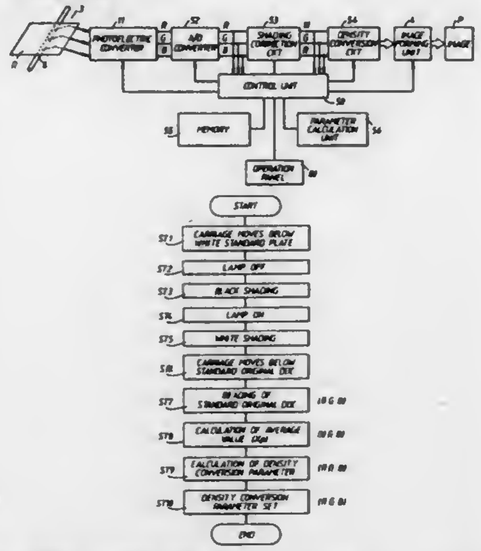
Masato Kuga, Kanagawa, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 911,154, Jul. 9, 1992. This application Apr. 25, 1995, Ser. No. 430,124

Claims priority, application Japan, Jul. 24, 1991, 3-184563

Int. Cl.^{6} H04N *1/46*

U.S. Cl. 358—518 **3 Claims**


PHOTOELECTRIC CONVERTER
A/D CONVERTER
SHADING CORRECTION CKT
DENSITY CONVERSION CKT
IMAGE FORMING UNIT
IMAGE
CONTROL UNIT
MEMORY
PARAMETER CALCULATION UNIT
OPERATION PANEL
START
ST1 CARRIAGE MOVES BELOW WHITE STANDARD PLATE
ST2 LAMP OFF
ST3 BLACK SHADING
ST4 LAMP ON
ST5 WHITE SHADING
ST6 CARRIAGE MOVES BELOW STANDARD ORIGINAL DOC
ST7 READING OF STANDARD ORIGINAL DOC
ST8 CALCULATION OF AVERAGE VALUE
ST9 CALCULATION OF DENSITY CONVERSION PARAMETER
ST10 DENSITY CONVERSION PARAMETER SET
END

1. An image forming apparatus comprising:

a reading means for reading a color image of a first original document and a second original document;

first conversion means for converting a first color image of the first original document and a second color image of the second original document, the first original document being a standard, read by the reading means into a plurality of first separate color signals and a plurality of second separate color signals corresponding to each of the color components of the first and second color images, respectively;

means for calculating density conversion parameters for the plurality of first separate color signals converted by the first conversion means;

second conversion means, operatively coupled to the calculating means, for converting each of the plurality of second separate color signals into optimum color signals using the density conversion parameters of the plurality of first separate color signals; and

means for forming a reproduced image of the second original document on an image forming medium based on the optimum color signals converted by the second conversion means with optimum density.

5,463,480

IMAGE PROCESSOR FOR OUTPUT DEVICES WHICH TRANSFORMS DATA INTO ACCEPTABLE COLOR SPACE

Lindsay W. MacDonald; Anthony J. Johnson, both of Bedfordshire, and Ronnier Luo, Leicestershire, all of, England, assignors to Crosfield Electronics Limited, Stevenage, England

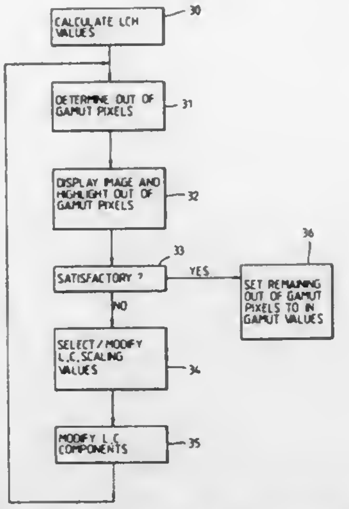
Filed Mar. 6, 1991, Ser. No. 665,123

Claims priority, application United Kingdom, Mar. 6, 1990, 9005030

Int. Cl.^{6} H04N *1/46;* G03F *3/08*

U.S. Cl. 358—520 **8 Claims**

1. A method of processing data representing an image in a first colour space suitable for controlling a first image output device to produce said image, the method comprising reversibly transforming the image into a perceptual colour space defined by lightness, colourfulness and hue components, said step of transforming the image into said perceptual colour space comprising an initial step of representing the image by tristimulus values or a function thereof and thereafter transforming the tristimulus values into said perceptual colour space via a colour appearance model, whereby surrounding and viewing conditions are taken into account; modifying the lightness, colourfulness and hue components of the image in accordance with a first predetermined algorithm so that all colours in the image fall within a gamut of a second image output device, said first predetermined algorithm limiting all colours that fall outside said gamut to the boundary of said gamut leaving those colours inside unaltered; transforming said modified lightness, colourfulness and hue components into a second colour space; and outputting said image on said second image output device in accordance with said reversibly transforming and modifying steps, wherein said second image output device is responsive to control signals defining colour components in said second colour space.


CALCULATE LCH VALUES
30
DETERMINE OUT OF GAMUT PIXELS
31
DISPLAY IMAGE AND HIGHLIGHT OUT OF GAMUT PIXELS
32
SATISFACTORY ?
33
YES
NO
SET REMAINING OUT OF GAMUT PIXELS TO IN GAMUT VALUES
36
SELECT / MODIFY L.C. SCALING VALUES
34
MODIFY L.C. COMPONENTS
35

5,463,481

LIQUID CRYSTAL DISPLAY HAVING LIQUID CRYSTAL LAYERS ALTERNATELY STACKED WITH INSULATING LAYERS WITH A THICKNESS OF AT MOST 5 MICRONS

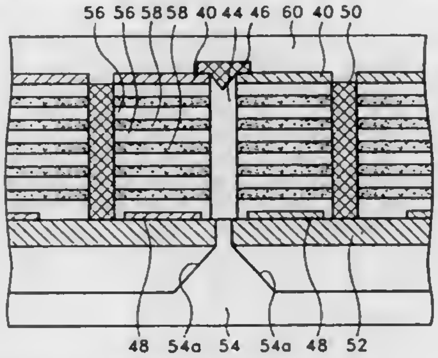
Nobuyuki Yamamura, Kyungki, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed May 10, 1993, Ser. No. 58,712

Claims priority, application Japan, May 8, 1992, 4-116146

Int. Cl.^{6} G02F *1/1333;1/1335*

U.S. Cl. 359—53 **19 Claims**



1. A pixel for a liquid crystal display, comprising:

a plurality of light transmitting electrically insulating layers with a predetermined gap between each layer, each said layer having a thickness of at most 5 microns; and

means for scattering incident light disposed in said gap between each of said layers, said means for scattering being formed of field-effect liquid crystal.

5,463,482

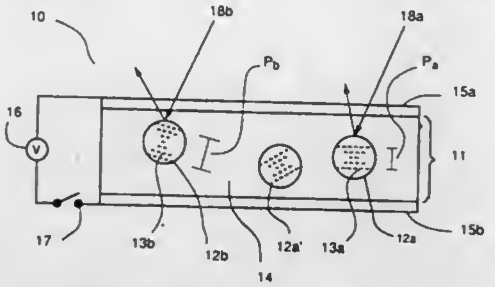
LIQUID CRYSTAL COMPOSITE WITH DROPLETS OF PLURAL CHIRAL NEMATIC MATERIALS WITH DIFFERENT REFLECTION BANDS

Philip J. Jones, Menlo Park, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Filed Oct. 18, 1993, Ser. No. 139,382

Int. Cl.^{6} G02F *1/13*

U.S. Cl. 359—51 **20 Claims**



6. A liquid crystal light valve, comprising

(a) spaced-apart first and second transparent electrodes and

(b) a liquid crystal-polymer composite disposed between the first and second electrodes, the composite comprising a matrix polymer;

plural volumes of a first liquid crystal material dispersed in the matrix polymer, which first liquid crystal material is chiral nematic and positively dielectrically anisotropic and has a characteristic reflection band; and

plural volumes of at least one additional liquid crystal material also dispersed in the matrix polymer, which at least one additional liquid crystal material also is chiral nematic and positively dielectrically anisotropic but has a characteristic reflection band different from the characteristic reflection band of the first liquid crystal material;

which composite at least one of reflects and scatters incident light in the absence of a sufficient electric field and is substantially transparent to incident light in the presence of a sufficient electric field.

5,463,483

ELECTRO-OPTICAL DEVICE HAVING AN ANODIC OXIDE FILM

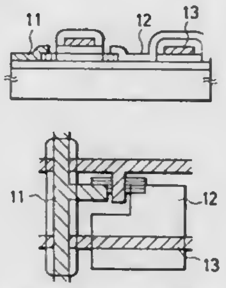
Shunpei Yamazaki, Tokyo, Japan, assignor to Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan

Filed Mar. 30, 1993, Ser. No. 38,107

Claims priority, application Japan, Apr. 1, 1992, 4-108488

Int. Cl.^{6} G02F *1/13*

U.S. Cl. 359—58 **36 Claims**



1. An electro-optical device having an active matrix, comprising:

a substrate;

a wiring provided on said substrate;

an anodic oxide film provided on said wiring and comprising an oxide of a material of said wiring; and

a pixel electrode provided on said substrate and provided in contact with said anodic oxide film,

wherein said active matrix comprises at least one top gate transistor and said wiring functions as a gate wiring of said top gate transistor of said active matrix.

5,463,484

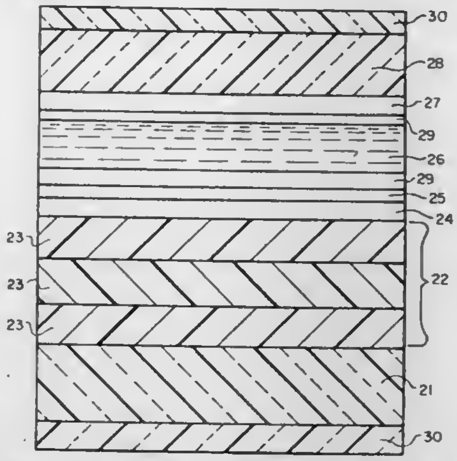
METHOD FOR MANUFACTURING LAMINATED U V-SENSITIVE COLOR FILTERS FOR LIQUID CRYSTAL DISPLAYS

Thomas P. Brody, 5823 Kentucky Ave., Pittsburgh, Pa. 15232

Filed Oct. 29, 1993, Ser. No. 145,414

Int. Cl.^{6} G02F *1/1335;1/1333*

U.S. Cl. 359—68 **13 Claims**



1. A method of producing at least one color filter for an electronic display element comprising the steps of:

a) laminating a pigmented layer structure onto a carrier sheet, wherein said pigmented layer structure includes an ultraviolet light-sensitive layer containing pigment of a first color of said at least one color filter and an attached release layer;

b) removing said attached release layer;

c) positioning a photomask adjacent said light-sensitive layer;

d) exposing said light-sensitive layer to ultraviolet light;

e) developing said exposed light-sensitive layer;

f) laminating another pigmented layer structure onto said developed layer, wherein said another pigmented layer structure includes another ultraviolet light-sensitive layer containing pigment of another color of said at least one color filter and another attached release layer;

g) removing said another attached release layer;

h) positioning another photomask adjacent said another light-sensitive layer;

i) exposing said another light-sensitive layer to ultraviolet light;

j) developing said exposed another light-sensitive layer;

k) repeating steps f) to j) for remaining colors of said color filter forming a stack of developed layers; and

l) depositing transparent conductors onto said stack of developed layers.

5,463,485

TERAHERTZ REPETITION RATE OPTICAL COMPUTING SYSTEMS, AND COMMUNICATION SYSTEMS AND LOGIC ELEMENTS USING CROSS-PHASE MODULATION BASED OPTICAL PROCESSORS

Robert R. Alfano, 3777 Independence Ave., Bronx, N.Y. 10463; Ping-Pei Ho, 240-42 69th Ave., Douglaston, N.Y. 11362, and Patrice Baldeck, 270 Convent Ave. #2C, New York, N.Y. 10031

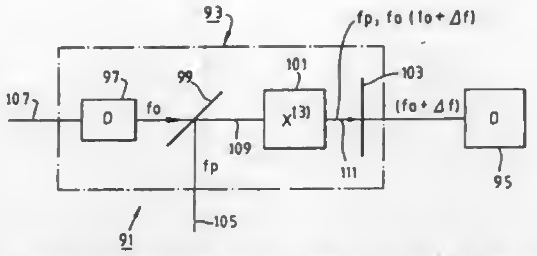
Continuation of Ser. No. 806,170, Dec. 12, 1991, Pat. No. 5,373,381, which is a division of Ser. No. 382,752, Jul. 21, 1989, Pat. No. 5,150,248. This application Jun. 15, 1994, Ser. No. 259,877

Int. Cl.^{6} G02F *3/00;2/02;1/39*

U.S. Cl. 359—107 **1 Claim**

1. An optical AND gate for performing an AND function on a first beam of light having intense pulses at a first frequency and a second beam of light having weak pulses of light at a second frequency, said optical AND gate comprising:

a) means for combining the two beams to form a third beam;



- b) a non-linear medium disposed along the path of the third beam, the light passed through the non-linear medium comprising a fourth beam which includes pulses of the frequency of the first beam, pulses of the frequency of the second beam and pulses of a third frequency, said pulses of the third frequency being pulses of the second frequency which have been frequency modulated by the first beam using cross-phase modulation; and
- c) filter means for removing pulses of the first frequency and pulses of the second frequency.

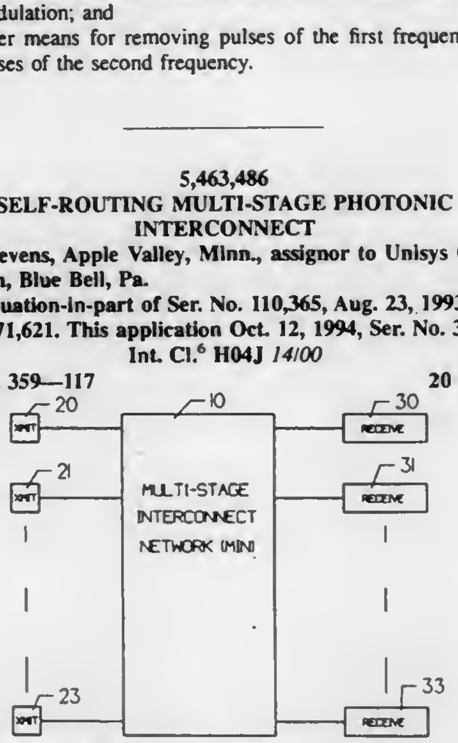
5,463,486
SELF-ROUTING MULTI-STAGE PHOTONIC INTERCONNECT

Rick Stevens, Apple Valley, Minn., assignor to Unisys Corporation, Blue Bell, Pa.

Continuation-in-part of Ser. No. 110,365, Aug. 23, 1993, Pat. No. 5,371,621. This application Oct. 12, 1994, Ser. No. 322,195

Int. Cl.^{6} H04J *14/00*

U.S. Cl. 359—117 **20 Claims**



17. A data transfer apparatus comprising:

- a. an interconnect network including a plurality of switch stages, each of said switch stages including a plurality of switches, each of said plurality of switches including a plurality of inputs and a plurality of outputs; said outputs of each of said plurality of switches in each of said plurality of switch stages are connected to at least one of said inputs on each of said plurality of switches in the next succeeding stage of said plurality of switch stages;
- b. a sending terminal including a routing controller for selectively providing a plurality of sacrificial routing messages, and including a message source coupled to a first stage of said plurality of switch stages for providing a data message thereto, and further including a switch controller coupled to said plurality of switches for selectively connecting said sending terminal to one of said inputs on said plurality of switches in said first stage of said plurality of switch stages;
- c. a receiving terminal including a coupling means coupled to said receiving terminal and to said plurality of switches for connecting said receiving terminal to a select one of said outputs on a selected one of said plurality of switches in the last stage of said plurality of switch stages, for receiving said data message.
- d. each of said plurality of switches comprising:
    - i. a crossbar element having a plurality of inputs and a plurality of outputs wherein said plurality of inputs of said crossbar element are coupled to a corresponding one of said plurality of inputs of said switch; said crossbar element providing communication from a selected one of said plurality of inputs to a selected one of said plurality of outputs;
    - ii. a plurality of decoder circuits wherein each of said plurality of decoder circuits is coupled to a corresponding one of said plurality of inputs of said crossbar element; each of said plurality of decoder circuits for decoding a corresponding one of said plurality of sacrificial routing messages and for providing a corresponding address and a corresponding request therefrom, resulting in a plurality of addresses and a plurality of requests;
    - iii. a multiplexer circuit coupled to said plurality of addresses;
    - iv. an arbitrator circuit coupled to said plurality of decoder circuits and further coupled to said multiplexer circuit for receiving said plurality of requests and for controlling said multiplexer circuit such that said multiplexer circuit selects one of said plurality of addresses; and
    - v. a switch configuration table coupled to said multiplexer circuit for receiving said selected one of said plurality of addresses and for providing a corresponding instruction to said crossbar element thereby establishing a corresponding communication path from a selected one of the plurality of inputs of said crossbar element to a selected one of the plurality of outputs of said crossbar element.

5,463,487
OPTICAL TRANSMISSION SYSTEM

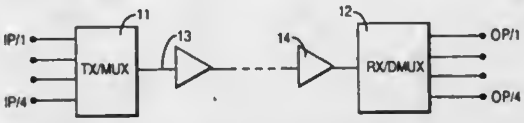
Richard E. Epworth, Sawbridgeworth, United Kingdom, assignor to Northern Telecom Limited, Montreal, Canada

Filed Jul. 29, 1994, Ser. No. 283,263

Claims priority, application United Kingdom, Jul. 31, 1993, 9315912

Int. Cl.^{6} H04J *14/02*

U.S. Cl. 359—124 **5 Claims**



1. A wavelength division multiplex (WDM) optical transmission system, including a transmitter, a receiver and an amplified optical transmission path therebetween, wherein the transmitter is provided with multiplexer means for multiplexing a plurality of wavelengths each carrying information signals on to the transmission path, wherein the transmitter has means for modulating the transmitted wavelengths each with a respective identification signal, and wherein each amplifier of the transmission path has detection means for recovering the identification signal from each wavelength present on the transmission path and gain control means for determining, from the recovered identification signals the number of wavelengths present on the transmission path whereby to control the total power output of that amplifier.

5,463,488
DISTRIBUTION OF CLOCK SIGNALS BY PUMP POWER MODULATION IN AN OPTICALLY AMPLIFIED NETWORK

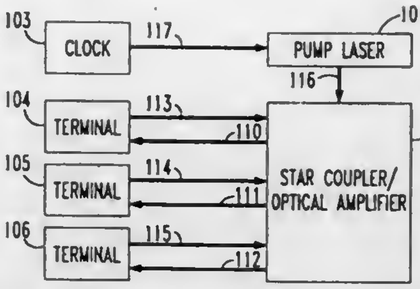
Gary J. Grimes, Thornton, Colo., assignor to AT&T IPM Corp., Coral Gables, Fla.

Continuation of Ser. No. 922,896, Jul. 31, 1992, abandoned. This application Sep. 6, 1994, Ser. No. 301,152

Int. Cl.^{6} H04B *10/02; 10/14*

U.S. Cl. 359—128 **5 Claims**

1. An apparatus in an optical switching system for supplying clock signals to a plurality of terminals connected to an optical switching network and said optical switching network responsive to data signals received at an optical wavelength from said terminals to switch said light at said optical wavelength between said terminals, comprising:



means for generating said clock signals in said optical switching system;

a pump optical source for producing optical energy at another optical wavelength;

an optically pumped optical amplifier having a signal input, a pump input and an output terminal in said optical switching network;

means in said optical switching network for interrupting said pump optical source at said other optical wavelength of light in response to a predefined portion of each of said clock signals and for not interrupting said pump optical source a remaining portion of each of said clock signals;

said amplifier responsive to said data signals at said optical wavelength received on said signal input terminal for amplifying said data signals at said optical wavelength using said optical energy at said other optical wavelength from said pump optical source and for combining the amplified data signals at said optical wavelength with said other optical wavelength on an output terminal;

means in optical switching network for transmitting said combined light to said terminals;

each of said terminals comprising an optical wavelength division demultiplexer for separating said light at said optical wavelength and said light at said other optical wavelength;

a receiver for converting said data signals in said optical Wavelength to electrical data signals and another receiver for directly converting said clock signals in said other optical wavelength to electrical clock signals; and

means for storing one of said electrical data signals in response to each of said clock signals.

5,463,489

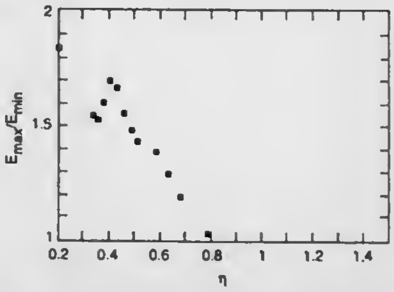
SOLITON TRANSMISSION SYSTEM HAVING SLIDING-FREQUENCY GUIDING FILTERS WITH PARTICULAR FILTER STRENGTHS AND SLIDING RATES

Pavel V. Mamyshev, Middletown, and Linn F. Mollenauer, Colts Neck, both of N.J., assignors to AT&T Corp., Murray Hill, N.J.

Continuation-in-part of Ser. No. 904,239, Jun. 25, 1992, Pat. No. 5,357,364. This application Aug. 29, 1994, Ser. No. 297,336

Int. Cl.⁶ H04B *10/12*

U.S. Cl. 359—173 **18 Claims**



1. A lightwave transmission system supporting soliton propagation in a particular band of frequencies comprising,

an optical fiber transmission medium comprising a plurality of optical amplifiers spaced apart along the optical fiber transmission medium and a plurality of optical filters spaced apart along the optical fiber transmission medium, wherein each optical filter exhibits a nominal center frequency substantially different from the nominal center frequency of each other optical filter to move the frequency of the soliton toward its nominal center frequency, each nominal center frequency being in the particular band of frequency, and

the optical filters have a filter strength η of between about 0.3–0.5 in soliton units.

5,463,490

LIGHT BEAM DEFLECTING DEVICE

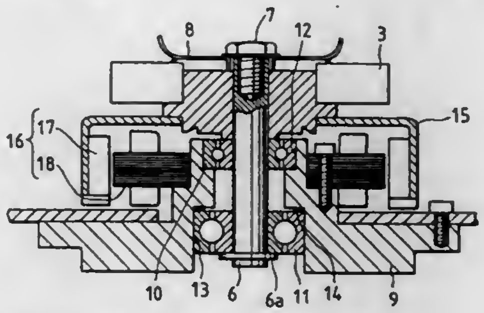
Masanori Seto, Saitama, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Mar. 11, 1993, Ser. No. 29,546

Claims priority, application Japan, Mar. 12, 1992, 4-087509

Int. Cl.⁶ G02B *26/08*

U.S. Cl. 359—200 **5 Claims**



1. A light beam deflecting device comprising:

a beam generator for generating a light beam;

a rotary polygon mirror for deflecting the light beam; and

a plurality of ball bearing members for supporting a rotary shaft of said polygon mirror rotatably at respective different positions in a longitudinal direction of said rotary shaft,

wherein said plurality of ball bearing members are so designed that any vibration which any one ball bearing member of said plurality of ball bearing members produces when rotated are different in frequency from any vibration which any other ball bearing member of said plurality of ball bearing members produces when rotated.

5,463,491

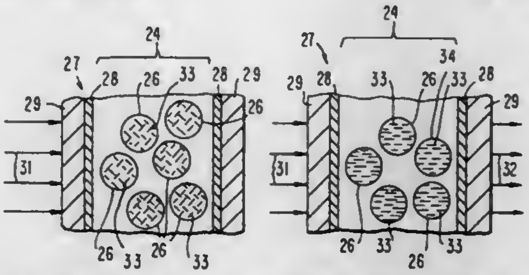
LIGHT VALVE EMPLOYING A FILM COMPRISING AN ENCAPSULATED LIQUID SUSPENSION, AND METHOD OF MAKING SUCH FILM

Joseph A. Check, III, West Bayshore, N.Y., assignor to Research Frontiers Incorporated, Woodbury, N.Y.

Continuation-in-part of Ser. No. 786,511, Nov. 1, 1991, abandoned. This application Nov. 6, 1992, Ser. No. 972,826

Int. Cl.⁶ G02B *26/00*

U.S. Cl. 359—296 **24 Claims**



1. A film suitable for use as the light-modulating unit of a light valve, comprising a cross-linked polymer matrix having droplets of a liquid light valve suspension distributed in and in direct contact with the cross-linked poller matrix, said liquid light valve suspension comprising organic particles suspended in a liquid suspending medium.

5,463,492

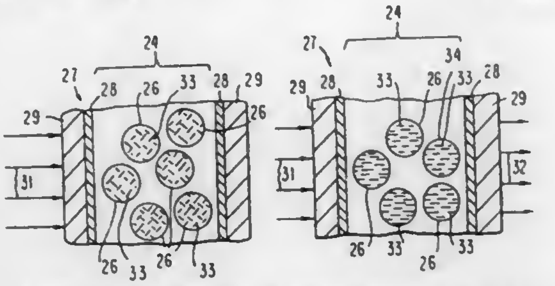
LIGHT MODULATING FILM OF IMPROVED CLARITY FOR A LIGHT VALVE

Joseph A. Check, III, West Bayshore, N.Y., assignor to Research Frontiers Incorporated, Woodbury, N.Y.

Continuation-in-part of Ser. No. 786,511, Nov. 1, 1991, abandoned. This application Nov. 6, 1992, Ser. No. 972,830

Int. Cl.^{6} G02B ***26/00***

U.S. Cl. 359—296 **28 Claims**



1. A film suitable for use as the light-modulating unit of a light valve, comprising a cross-linked polymer matrix having droplets of a liquid light valve suspension distributed in the cross-linked polymer matrix, said liquid light valve suspension comprising particles suspended in a liquid suspending medium, said polymer matrix comprising a main chain that is insoluble in said liquid suspending medium and pendant polymeric groups that are soluble in said liquid suspending medium.

5,463,493

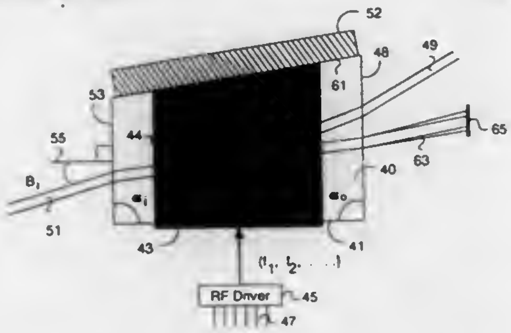
ACOUSTO-OPTIC POLYCHROMATIC LIGHT MODULATOR

Manhar L. Shah, Melbourne Beach, Fla., assignor to MVM Electronics, Melbourne, Fla.

Filed Jan. 19, 1993, Ser. No. 5,992

Int. Cl.^{6} G02F ***1/33***

U.S. Cl. 359—312 **37 Claims**



37. An acousto-optic polychromatic light modulating apparatus comprising an acousto-optic medium, an acoustic wave launching transducer attached to said acousto-optic medium and operative to simultaneously receive a plurality of RF signals having respectively different RF frequencies and, in response thereto, to simultaneously launch a plurality of acoustic waves having respectively different frequencies associated with the respectively different RF frequencies applied thereto, said acousto-optic medium receiving a substantially co-linear polychromatic light beam incident upon and travelling through said acousto-optic medium and exiting said acousto-optic medium, such that respectively different ones of said plurality of acoustic waves associated with respectively different RF frequencies launched by said transducer interact with respectively different optical wavelength components of said polychromatic light beam, so as define a composite color output polychromatic light beam having color components thereof defined in accordance with said respectively different RF frequencies.

5,463,494

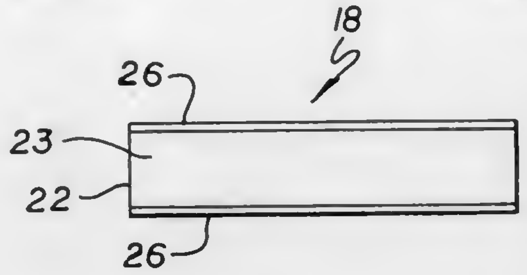
EXTRINSIC SEMICONDUCTOR OPTICAL FILTER

Lowell M. Hobrock, Los Angeles, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Continuation of Ser. No. 912,404, Jul. 13, 1992, abandoned. This application Dec. 23, 1993, Ser. No. 174,573

Int. Cl.^{6} G02B ***5/20;5/28;*** **H01L** ***31/00***

U.S. Cl. 359—359 **18 Claims**



1. An optical filter comprising:

a layer of semiconductor material adapted to absorb optical energy below a first wavelength and transmit optical energy above said first wavelength, said first wavelength being in the infrared bandwidth, and

a plurality of layers of optical thin film material, disposed on said semiconductor layer, for transmitting optical energy at a second wavelength, which is above said first wavelength, and for reflecting optical energy at a third wavelength, which is above said second wavelength, whereby said semiconductor and optical layers in combination provide high transmission in-band, low transmission out-of-band and a sharp cutoff.

5,463,495

AIMING TELESCOPE

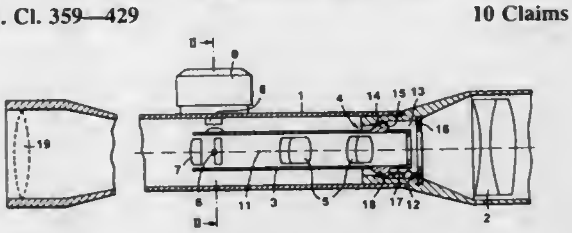
Erwin Murg, Neu-Rum, Austria, assignor to Swarovski Optik KG, Absam, Austria

Filed May 18, 1994, Ser. No. 245,420

Claims priority, application Germany, Nov. 18, 1993, 43 39 397.7

Int. Cl.^{6} G02B ***23/10;*** **F41G** ***1/38***

U.S. Cl. 359—429 **10 Claims**



1. An aiming telescope having a main tube with an eyepiece and an objective, an inner tube defining a longitudinal center axis and an outer diameter and being mounted within said main tube and having a first end extending toward said eyepiece and a second end extending toward said objective, said maid tube and said inner tube being engaged at a joint having a first joint portion fixed on said inner tube adjacent said first end of said inner tube and an opposed second joint portion fixed to said main tube said inner tube comprising an inversion system and a reticle, a pair of adjusting spindles disposed on said main tube at an angle to each other and acting on said inner tube at a distance from said joint toward said second end of said inner tube, and at least one spring for loading said inner tube against said adjusting spindles, said at least one spring defining a longitudinal axis and being supported at a distance from said center axis of said inner tube, between said first

joint portion fixed on said inner tube and said main tube so that the axis of said spring does not coincide with the axis of said inner tube.

5,463,496

IMAGE PICKUP OPTICAL SYSTEM WHICH MINIMIZES THE EFFECTS OF SPURIOUS SIGNALS

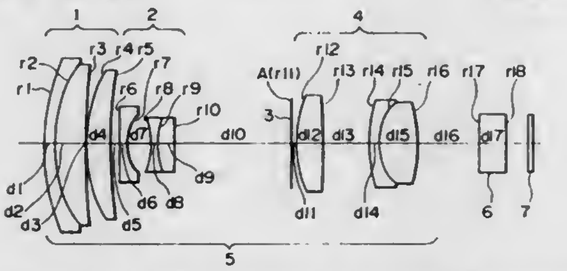
Koichi Ise, Chiba, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Mar. 14, 1994, Ser. No. 209,714

Claims priority, application Japan, Mar. 30, 1993, 5-093855

Int. Cl.^{6} G02B *3/02;13/18;9/14*

U.S. Cl. 359—497 **7 Claims**



1. An image pickup optical system having an image pickup lens system having a plurality of lenses arranged in multiple stages for forming an image of an object on an image plane of an image pickup device, said image pickup optical system comprising:

a double refraction plate arranged downstream of said image pickup lens system,

first optical means for determining the F-number of said image pickup lens system by a diaphragm stop, said first optical means operating when the F-number is not less than a pre-set value in conjunction with said double refraction plate for lowering the modulation transfer function (MTF) for a range of the spatial frequency not less than the spatial frequency which is prone to spurious signals,

second optical means operating when the F-number is not more than a pre-set value in conjunction with said double refraction plate for lowering the modulation transfer function (MTF) for a range of the spatial frequency not less than the spatial frequency which is prone to spurious signals,

wherein the relation MTF($2r_c$) is an MTF value on the optical axis in the image plane when the image pickup lens system is combined with said double refraction plate, said MTF($2r_c$) being also an MTF value at a spatial frequency $2r_c$, r_c being a cut-off frequency by the double refraction plate, wherein the relation

$$\frac{MTF_{MAX}(r_c/2) - MTF_{MIN}(r_c/2)}{MTF_{MAX}(r_c/2)} \leqq .3$$

is satisfied, wherein MTF_{MAX} ($r_c/2$) and MTF_{MIN}($r_c/2$) are a maximum value and a minimum value, respectively, of the MTF at the spatial frequency $r_c/2$ when said aperture of said first optical means is changed from the fully opened diaphragm to said pre-set value of the F-number, and

said pre-set value of the F-number being an MTF value which prevails when assumed that the image pickup lens system is free of aberration and only the diffraction at the aperture of the diaphragm in said first optical means contributes to MTF, said pre-set value of the F-number also being a value of the F-number which prevails when the value of the MTF for a spatial frequency $2r_c$ is 0.4, with r_c being the cut-off frequency by the double refraction plate.

5,463,497

ILLUMINATION DEVICE INCLUDING AN OPTICAL INTEGRATOR DEFINING A PLURALITY OF SECONDARY LIGHT SOURCES AND RELATED METHOD

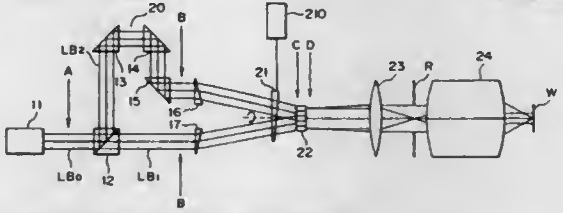
Masato Muraki, Yokohama; Akiyoshi Suzuki, Tokyo, and Shunzo Imai, Yamato, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 918,005, Jul. 24, 1992, abandoned, which is a division of Ser. No. 534,246, Jun. 7, 1990, Pat. No. 5,153,773. This application Jun. 16, 1994, Ser. No. 261,229

Claims priority, application Japan, Jun. 8, 1989, 1-146216; Jan. 20, 1990, 2-011534; Mar. 1, 1990, 2-050587

Int. Cl.^{6} G02B *27/10;* **F21K** *7/00*

U.S. Cl. 359—618 **38 Claims**



1. An exposure apparatus comprising:

a light source for producing light for transferring a pattern of an original onto a substrate;

a light dividing optical system for dividing light from said light source into a plurality of light beams;

an illumination optical system including an optical integrator, said optical integrator receiving the plurality of light beams and defining a plurality of secondary light sources to illuminate the substrate; and

changing means for changing the position of incidence of each of the plurality of light beams on said optical integrator, said changing means shifting the position of incidence of each of the light beams toward or away from the center of said optical integrator.

5,463,498

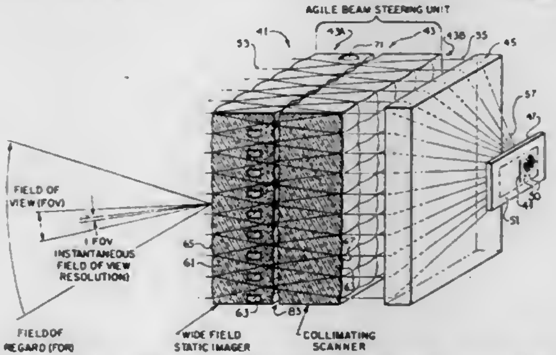
INTERNALLY COOLED LARGE APERTURE MICROLENS ARRAY WITH MONOLITHICALLY INTEGRATED MICROSCANNER

George Gal, Palo Alto, and Howard E. Morrow, San Jose, both of Calif., assignors to Lockheed Missiles & Space Company, Inc., Sunnyvale, Calif.

Division of Ser. No. 11,323, Nov. 29, 1993, Pat. No. 5,420,720, which is a continuation-in-part of Ser. No. 904,316, Jun. 25, 1992, and a continuation-in-part of Ser. No. 982,514, Nov. 27, 1992, Pat. No. 5,310,623. This application Jan. 13, 1994, Ser. No. 180,608

Int. Cl.^{6} G02B *27/10;23/00*

U.S. Cl. 359—622 **7 Claims**



1. A unit cell train for transmitting light through two matched microlenses, one of which is movable with respect to the other to provide scanning of a field of view, said unit cell train comprising,

a first, wide-field static imager microlens having first and second surfaces in the unit cell train, a second, collimating scanner microlens having third and fourth surfaces in the unit cell train and movable over an arc with respect to the first microlens to provide scanning of the field of view,

an air space between the second surface and the third surface,

the first surface on the first microlens serving as an entrance pupil and aperture stop for the cell train and constructed to form an image within the first microlens, and

the fourth surface on the second microlens serving as an exit pupil for the cell train and constructed to collimate all of the light which enters the cell train without reduction of intensity of the light at edges of the field of view.

5,463,499

ZOOM LENS SYSTEM

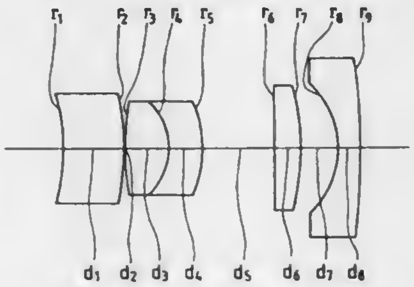
Takayuki Ito, Tokyo, and Tetsuya Abe, Hokkaido, both of, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 7, 1993, Ser. No. 1,745

Claims priority, application Japan, Jan. 14, 1992, 4-042495

Int. Cl.⁶ G02B *15/14*

U.S. Cl. 359—692 **15 Claims**



1. A zoom lens system, comprising:

in order from the subject side, a first lens group having a positive power; and

a second lens group having a negative power, the distance between said first lens group and said second lens group being varied to perform zooming,

said first lens group consists of, in order from the object side, a first subgroup and a second subgroup having a positive power,

wherein said first subgroup consists of a single lens element having at least one aspheric surface, said second subgroup consists of a cemented lens having a divergent cemented surface, and said first lens group satisfying the following conditions:

$$-.7<fS/fla<.3$$

$$.2<fS/flb<.3$$

$$-.7<fS/fc<0$$

where

fS: the focal length of the overall system at the wide-angle end;

fla: the focal length of the first subgroup;

flb: the focal length of the second subgroup;

fc: the focal length of the cemented surface in the first lens group and fc=rc/(Nr–Nf); and

where

rc: the radius of curvature of the cemented surface; and

Nr: the refractive index at the d-line of the lens element on the image side of the cemented surface; and

Nf: the refractive index at the d-line of the lens element on the object side of the cemented surface.

5,463,500

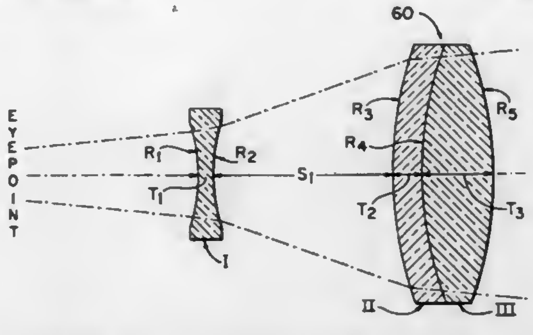
LIGHT-WEIGHT THREE-ELEMENT CLINICAL VIEWER

Richard A. Buchroeder, Tucson, Ariz., assignor to Orascoptic Research, Inc., Madison, Wis.

Filed Aug. 31, 1993, Ser. No. 114,870

Int. Cl.⁶ G02B *13/00;23/00*

U.S. Cl. 359—744 **3 Claims**



1. A magnification viewer having a single element eyepiece lens and a two-element objective lens; the magnification viewer having the design parameters represented in the following table:

Element	n_d	v_d	Radius	Thickness	Separation
I	1.517	64.2	$R_1 = 55.780$ $R_2 = 25.110$	$T_1 = 1.0$	$S_1 = 21.14$
II	1.805	25.4	$R_3 = 93.987$ $R_4 = 48.006$	$T_2 = 1.5$	
III	1.517	64.2	$R_4 = 48.006$ $R_5 = 30.240$	$T_3 = 6.5$	

wherein the Roman numeral I identifies the lens element of the single element eyepiece lens and the Roman numerals II and III identify the two lens elements of the objective lens, from the eyepoint side to the object side; n_d represents the refractive index of each element; v_d is the Abbe dispersion number; R_1–R_5 represent the radii, in millimeters, of the respective refractive surfaces, in order, from the eyepoint side to the object side; T_1–T_3 and S_1 represent the thicknesses, in millimeters, of the lens elements and air spaces, respectively, from the eyepoint side to the object side measured along an optical centerline.

5,463,501

OBJECTIVE-LENS DRIVING APPARATUS

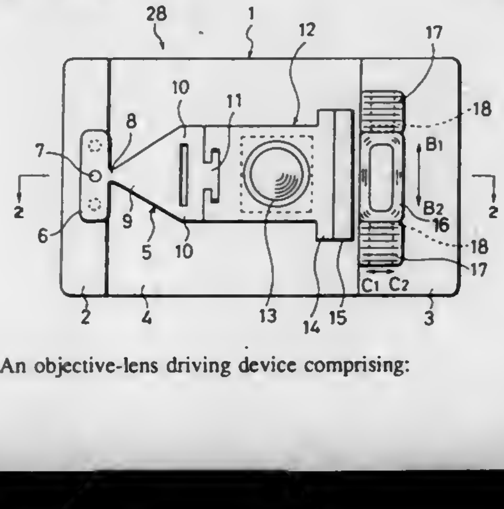
Hiroyuki Suzuki, Higashihiroshima, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 969,452, Oct. 30, 1992, abandoned. This application Nov. 3, 1994, Ser. No. 336,232

Claims priority, application Japan, Jan. 13, 1992, 4-003704; Jun. 2, 1992, 4-141459

Int. Cl.⁶ G02B *7/02*

U.S. Cl. 359—814 **23 Claims**



1. An objective-lens driving device comprising:

holding means for holding an objective lens having an optical axis through a center of the lens;

supporting means having a fixing end and a rocking end situated opposite to the fixing end, the supporting means being arranged to support the holding means that is connected to the rocking end, the fixing end being fixed to a base of the objective-lens driving device;

a magnet, for generating a constant magnetic field and being fixed to the holding means;

coil means for generating a controlling magnetic field by which the holding means is driven in a focusing direction along the optical axis and in a tracking direction perpendicular to the optical axis by an interaction with the magnet, the coil means being fixed to the base and aligned with the magnet; and

magnetic means installed with the coil means and disposed near the magnet for generating an interactive magnet force that attracts the magnetic means in a single direction along a center line passing through the optical axis and a center of the magnet, the magnet holding the objective lens in a stable, neutral position when the controlling magnetic field is substantially absent, wherein the magnetic means is disposed symmetrically with respect to said center line.

5,463,502

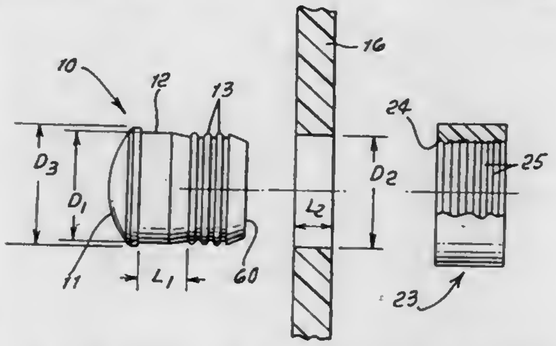
LENS ASSEMBLY FOR USE WITH LEDS

John M. Savage, Jr., 538-B Via De La Valle, Solana Beach, Calif. 92075

Filed May 16, 1994, Ser. No. 243,418

Int. Cl.^{6} G02B *7/02*

U.S. Cl. 359—819 **12 Claims**



1. In a lens assembly for use with an LED, the combination comprising

a) a lens unit having a forward light transmitting lens portion and a tubular sleeve extending rearwardly therefrom,

b) annularly outwardly protuberant rings integral with the sleeve, and a frusto-conical camming surface on and at the end of the sleeve,

c) and a retainer ring assembled onto and over the sleeve in response to camming engagement with said frusto-conical surface, said retainer ring having interference engagement with said protuberant rings, for gripping the sleeve and for retaining the lens unit to a display panel having an opening through which the lens unit sleeve has been received, the gripped sleeve sized to allow the LED to be freely inserted into the sleeve and positioned for light transmission from the LED through said forward lens portion of said unit.

5,463,503

METHOD FOR PRODUCING A POLYGON MIRROR

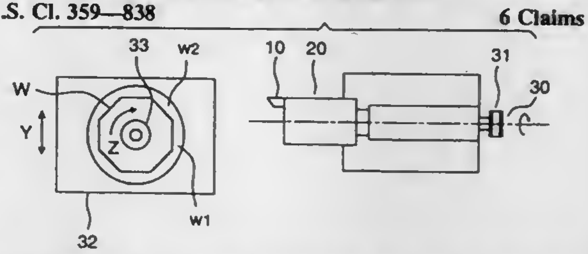
Sunao Kawada; Masataka Inagi; Yoshio Iwamura; Toyotsugu Itoh, and Takayoshi Hashimoto, all of Hachioji, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Dec. 6, 1993, Ser. No. 163,036

Claims priority, application Japan, Dec. 25, 1992, 4-357732

Int. Cl.^{6} G02B *5/08;* **B23B** *3/00*

U.S. Cl. 359—838 **6 Claims**



1. A method for producing a polygonal mirror with a diamond tool, comprising the steps of:

(a) providing the diamond tool so that said diamond tool includes:
  - a major cutting edge which is formed straight by a rake face and a side flank, said major cutting edge having a first side and a second side;
  - an end cutting edge which is formed straight by said rake face and a front flank, said end cutting edge having a third side;
  - a microscopic cutting edge which is arranged between said second side and said third side so that said major cutting edge and said microscopic cutting edge together create a first corner at said second side, and said end cutting edge and said microscopic cutting edge together create a second corner at said third side;
  - wherein said rake face is inclined downward from said second corner to said first side for an angle θ; said microscopic cutting edge has a length L, within a range between about 0.1 mm and about 0.4 mm, in a direction of said end cutting edge; said microscopic cutting edge at said first corner has a swept back amount t, within a range exceeding 0.1 μm and not more than about 0.6 μm, from an extended line of said end cutting edge in a direction perpendicular to said extended line; a front relief angle γ of said front flank is 3°; and said angle θ, said length L, said swept back amount t, and said front relief angle γ satisfy an equation:

$$t \approx L.\ \tan\theta\ .\tan\gamma$$

(b) holding a material with a holding means; and

(c) feeding said material by said holding means relative to said diamond tool while said material is in contact with said diamond tool so that said material is cut with said major cutting edge and is thereafter microscopically cut with said microscopic cutting edge, and is thereafter burnish-finished with said end cutting edge.

5,463,504

MAGNETIC DISK SYSTEM AND WAVEFORM EQUALIZER THEREFOR

Hiroshi Kimura; Shoichi Miyazawa; Ryutaro Horita; Kenichi Hase, all of Yokohama; Akihiko Hirano, Fujisawa, and Akira Uragami, Sawa, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

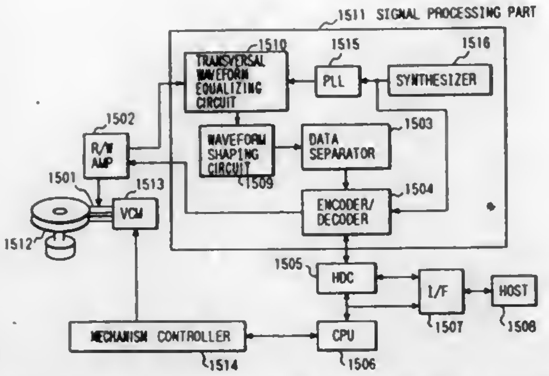
Filed May 18, 1993, Ser. No. 62,770

Claims priority, application Japan, May 18, 1992, 4-124456

Int. Cl.^{6} G11B *5/09*

U.S. Cl. 360—65 **13 Claims**

1. A magnetic disk system comprising: a mechanism and associated control circuit for reading and writing data on a magnetic disk; a frequency synthesizer for producing a first clock signal having a frequency which depends on the transfer rate of said data; a phase-locked loop (PLL) circuit for producing a control signal in correspondence to the frequency of said first clock signal; a wave-



form equalizing circuit for equalizing the waveform of an original signal in accordance with said control signal thereby to produce an equalized signal; a waveform shaping circuit for producing code pulses from said equalized signal; a data separator for producing a second clock signal which is synchronous with said code pulses; a decoding circuit for decoding said code pulses based on said second clock signal; and an encoding circuit for encoding record data based on said first clock signal.

5,463,505
HELICAL-SCAN INFORMATION RECORDING-PLAYBACK APPARATUS

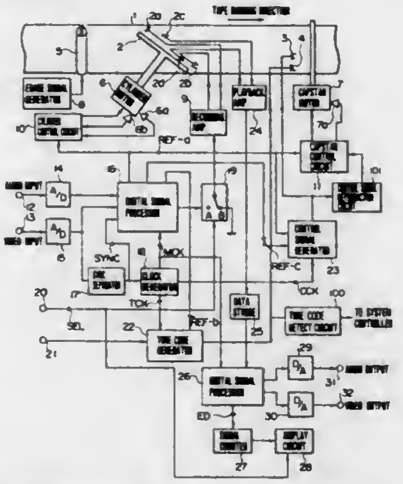
Kouji Kaniwa; Hideo Nishijima; Kouji Fujita, all of Katsuta, and Keizo Nishimura, Yokosuka, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 15, 1990, Ser. No. 538,655

Claims priority, application Japan, Jun. 16, 1989, 1-152313

Int. Cl.^{6} G11B *15/46;15/12*

U.S. Cl. 360—73.04 **33 Claims**



1. An information recording apparatus comprising:

means for recording first information on a first track on a tape which is formed by helical scanning of rotary heads;

means for recording second or third information on a second or third track on the tape which is formed by a fixed head in a longitudinal direction of the tape;

switching means for selecting between a first operating mode in which said first information and said second or third information are recorded, and a second operating mode in which said first information is not recorded and said second or third information is recorded; and

means for multiplying by N said second or third information in a frequency domain thereof, N not being equal to zero, and means for multiplying by N a speed of the tape with respect to a normal recording tape speed, said apparatus operating in said first or second operating mode to transport the tape at the speed N times the normal recording tape speed thereby to record said second or third information which has been multiplied by N in the frequency domain.

5,463,506
HEAD DRUM APPARATUS

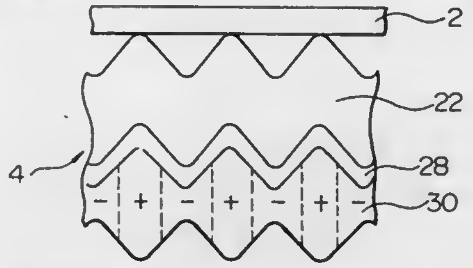
Tamotsu Mitsuyasu, Kamakura, and Takuji Sekiguchi, Machida, both of, Japan, assignors to Nippon Hoso Kyokai, Tokyo, Japan

Filed Nov. 23, 1993, Ser. No. 155,800

Claims priority, application Japan, Nov. 25, 1992, 4-315194; Feb. 8, 1993, 5-020090

Int. Cl.^{6} G11B *21/02*

U.S. Cl. 360—77.17 **19 Claims**



1. A head drum apparatus, comprising:

a cylindrical stationary head drum having an inner peripheral surface and an outer peripheral surface around a portion of which a magnetic tape is wound; and

a piezoelectric ceramic member coupled to said inner peripheral surface of said head drum and including a cylindrical piezoelectric ceramic material which has an inner peripheral surface and an outer peripheral surface, first electrode means formed on said inner peripheral surface of said piezoelectric ceramic material, and second electrode means formed on said outer peripheral surface of said piezoelectric ceramic material;

wherein said piezoelectric ceramic material includes at least two portions each of which is polarized by applying DC voltage between said first electrode means and said second electrode means such that adjacent ones of said portions have polarities opposite to each other, and said first electrode and said second electrode provides flexural vibration in response to AC voltage applied between said first electrode means and said second electrode means to cause said outer peripheral surface of said head drum to vibrate.

5,463,507
LOW PROFILE DISK DRIVE APPARATUS INCORPORATING A THREE-TIERED HOUSING

James H. Morehouse, Jamestown; David M. Furay; John Blagaila, both of Boulder; F. Eugene Dion; Scott A. Shelstad, both of Longmont, and Jimmy L. Woods, Arvada, all of Colo., assignors to Conner Peripherals, Inc., San Jose, Calif.

Continuation of Ser. No. 702,935, May 20, 1991, abandoned, which is a division of Ser. No. 432,664, Nov. 6, 1989, Pat. No. 5,025,336. This application Dec. 2, 1993, Ser. No. 161,684

Int. Cl.^{6} G11B *33/14*

U.S. Cl. 360—97.02 **4 Claims**

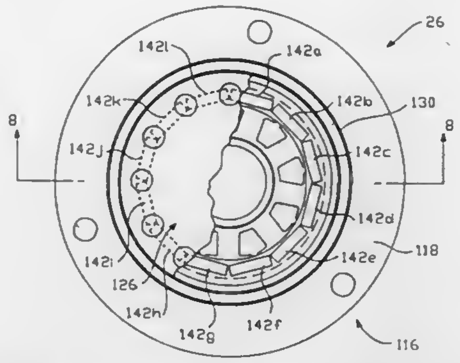
1. An information storage apparatus, comprising:

a record carrier;

a transducer for communicating with said record carrier;

means for moving said transducer relative to said record carrier;

a motor for moving said record carrier, said motor having a height dimension of approximately 0.35 inch, said motor including a substantially planar magnet being made from a material including at least one of the following: neodymium and samarium, said magnet having an energy product in



excess of approximately 30 million gauss-oersteds, said energy product being sufficient to rotate said record carrier; and

a housing for containing said record carrier, said transducer, and said motor.

5,463,508

Patent Not Issued For This Number

5,463,509

DISC CARTRIDGE HOLDER HAVING A SHUTTER CONTROL ARM DISPOSED IN A KEY-HOLE SHAPED APERTURE FORMED IN THE CARTRIDGE HOLDER

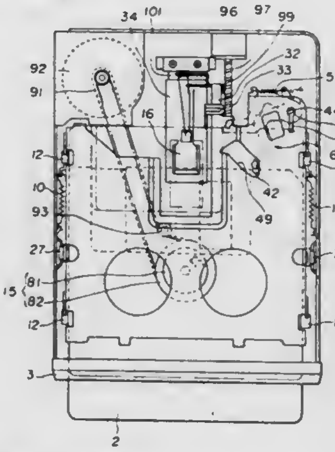
Yuji Suzuki, Kanagawa; Hirohiko Shimizu, Tokyo; Hiroyuki Suzuki, and Kiyoaki Tsuji, both of Kanagawa, all of, Japan, assignors to Sony Corporation, Tokyo, Japan

Division of Ser. No. 152,969, Nov. 15, 1993, Pat. No. 5,400,198, which is a continuation of Ser. No. 641,778, Jan. 16, 1991, abandoned. This application Jul. 20, 1994, Ser. No. 278,075

Claims priority, application Japan, Jan. 19, 1990, 2-3613 U; Jan. 19, 1990, 2-10093; Jan. 19, 1990, 2-10094; Jan. 20, 1990, 2-11032; Jan. 31, 1990, 2-8356 U

Int. Cl.^{6} G11B *17/04*

U.S. Cl. 360—99.06 **2 Claims**



1. A disc drive comprising:

a cartridge holder into which a disc cartridge is insertable, said cartridge holder having a keyhole-shaped aperture with a circular portion and a straight slot portion formed therein;

means operatively interconnecting said cartridge holder with a chassis for selectively raising and lowering the disc cartridge with respect to the chassis; and

a shutter control arm disposed in said cartridge holder, said shutter control arm having a shutter engaging member arranged at one end thereof and which is receivable in a recess formed in the leading edge of the disc cartridge which is inserted into the cartridge holder, said shutter control arm being arranged to respond to the force which is applied thereto by said disc cartridge to move in a manner which opens a shutter which is slidably mounted on the disc cartridge, wherein said shutter control arm has a rectangular projection at an end thereof opposite said shutter engaging member with a longer dimension of said rectangular projection orientated toward said shutter engaging member, said rectangular projection being slidably received by said straight slot portion to be rotatably maintained in said circular portion of said keyhole-shaped aperture formed in said cartridge holder, whereby said shutter control arm is pivotally mounted in said cartridge holder so as to pivot about said circular portion.

5,463,510

DISK DRIVE SYSTEM HAVING COMBINED CLAMP/ EJECT SWITCH

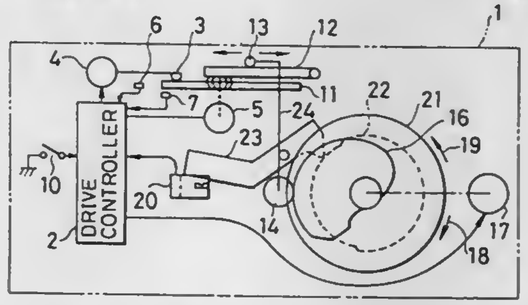
Kazushi Takahashi, Chichibu, Japan, assignor to Canon Denshi Kabushiki Kaisha, Saitama, Japan

Continuation of Ser. No. 642,514, Jan. 17, 1991, abandoned. This application May 18, 1994, Ser. No. 246,469

Claims priority, application Japan, Jan. 20, 1990, 2-11030

Int. Cl.^{6} H03K *17/04*

U.S. Cl. 360—99.07 **13 Claims**



1. A disk drive system with a disk loading/ejection control mechanism, comprising:

a disk insertion detection switch for detecting an insertion of a disk;

a first cam member for controlling a disk loading mechanism for loading and ejection operations of said disk when it is inserted;

drive means for driving to rotate said first cam member to cause said disk loading mechanism to perform the loading and ejection of said disk;

a loading/ejection position detection switch for detecting both loading and ejection positions of said disk, said loading/ ejection position detection switch having a movable member;

a second cam member for controlling a movement of said movable member of said loading/ejection position detection switch, said second cam member being co-operatively operated with said first cam member; and

control means, responsive to an output of said disk insertion detection switch to drive said drive means, and responsive to both the leading and trailing edges of an output from said loading/ejection position detection switch on the basis of rotation of said second cam member, for detecting the disk loading and ejection positions on the basis of said leading or trailing edges to control said drive means, the output being generated in accordance with the movement of said movable member, the leading edge corresponding to the movement of said movable member in one direction, and the trailing edge corresponding to the movement of said movable member in another direction.

5,463,511

SPINDLE UNIT HAVING PRE-LOAD MECHANISM

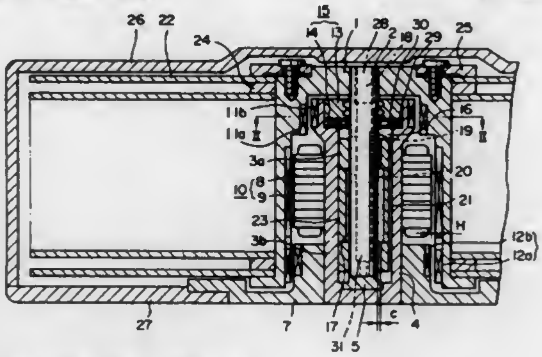
Masaaki Nakano, Hitachi; Tomoaki Inoue, Mito; Hideaki Amano, Odawara; Akio Takatsuka, Hiratsuka; Osamu Beppu, Odawara; Kenji Mori, Tsuchiura; Takashi Yoshida, and Takashi Kohno, both of Ibaraki, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 17, 1993, Ser. No. 123,354

Claims priority, application Japan, Sep. 17, 1992, 4-247573; Dec. 16, 1992, 4-335666; Jun. 22, 1993, 5-150106

Int. Cl.^{6} G11B *19/20*

U.S. Cl. 360—99.08 **4 Claims**



1. A spindle unit comprising:

a hub having a spindle;

a bearing housing into which said spindle is inserted;

a pair of ring-shaped radial sliding bearings separated from each other in a thrust direction and provided at inner surface portions of said bearing housing, for supporting said spindle in a radial direction, said spindle penetrating said pair of ring-shaped radial bearings;

a sealing mechanism including a magnetic fluid seal and screw seal, said magnetic fluid seal is fitted at an inner surface portion of said bearing housing to have a cavity formed between a surface of one of said radial bearings and a surface of said magnetic fluid seal, and said screw seal is fitted on said magnetic fluid seal such that a magnetic fluid injected into said bearing housing is prevented from scattering to an outside of said bearing housing;

a rotating mechanism for rotating said spindle;

a thrust sliding bearing provided at a bottom portion of said bearing housing for supporting said spindle in the thrust direction; and

a pre-load mechanism including at least one pair of ring-shaped magnets with a first ring-shaped magnet being provided at an outer upper portion of said bearing housing and a second ring-shaped magnet being provided at an inner upper portion of said hub such that said first ring-shaped magnet is provided at a shifted position with respect to said second ring-shaped magnet in the thrust direction for preloading said spindle with respect to at least the thrust direction, said second ring-shaped magnet substantially faces said first ring-shaped magnet in the radial direction, a third ring-shaped magnet provided at an outer lower portion of said bearing housing and a fourth ring-shaped magnet provided at the inner lower portion of said hub such that said fourth ring-shaped magnet substantially faces said third ring-shaped magnet in the radial direction, a pre-loading means for pre-loading said spindle to said inner surface portions of said pair of ring-shaped bearings by radial direction components of a first interaction between said first and second ring-shaped magnets and a second interaction between said third and fourth ring-shaped magnets,

wherein magnitudes of the radial direction components of said first and second interactions are isometric with respect to a center of said radial bearings before the pre-loading and are maximum in the same radial direction.

5,463,512

MAGNETIC DISK APPARATUS

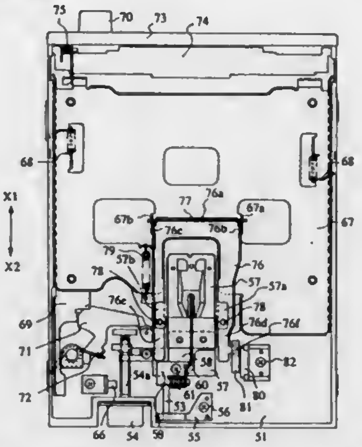
Akira Hashimoto, and Hiroshi Miwa, both of Kanagawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 900,063, Jun. 16, 1992, abandoned. This application Aug. 31, 1994, Ser. No. 299,325

Claims priority, application Japan, Jun. 19, 1991, 3-147386; Feb. 15, 1992, 4-028681; Feb. 15, 1992, 4-059090; Jun. 12, 1992, 4-153688

Int. Cl.^{6} G11B *5/48;5/54*

U.S. Cl. 360—104 **14 Claims**



1. A magnetic disk apparatus including a frame and having an upper head and a lower head at a facing position of a head arm and a head carriage, respectively, said head arm is rotatably mounted on the frame and can rotate between a lower position where the heads are able to write and read to/from a disk and an upper position where the heads are remotely located from the disk, and spring means, coupled to the head arm, for urging the head arm to the lower position, the apparatus comprising:

an arm load board, movably attached to the frame, the arm load board movable between an upper supporting position during which the arm load board is in contact with and supports the head arm away from the lower position of the head arm, and a lower non-supporting position during which the head arm is no longer in contact with the arm load board; and

damper means, coupled to the arm load board, for urging the arm load board away from its lower non-supporting position such that the arm load board moves slowly from its upper supporting position to its lower non-supporting position;

wherein the arm load board moves from its upper supporting position to its lower non-supporting position against the force of the damper means so as to slowly and consistently support movement of the head arm between its upper and lower positions.

5,463,513

MAGNETIC HEAD ASSEMBLY FOR A MAGNETIC DISK DRIVE

Yoshimasa Hoshino, Ohta, Japan, assignor to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 907,282, Jul. 1, 1992, abandoned. This application Sep. 23, 1994, Ser. No. 311,711

Claims priority, application Japan, Jul. 1, 1991, 3-159326

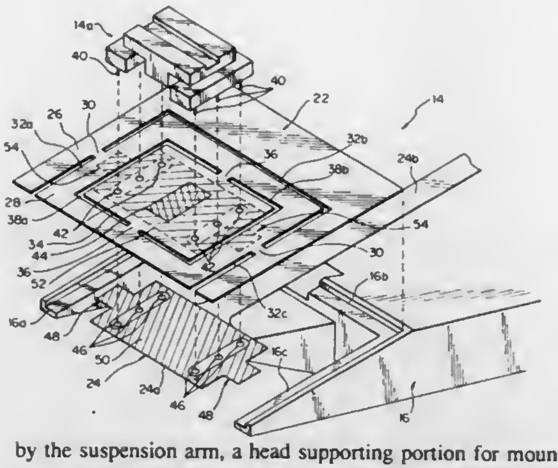
Int. Cl.^{6} G11B *5/48*

U.S. Cl. 360—104 **12 Claims**

1. A magnetic head assembly supported by a free end of a suspension arm for recording and reproducing data from a magnetic recording medium, said assembly comprising:

a magnetic head for recording and reproducing data from said recording medium;

a movable leaf spring member for allowing said magnetic head to behave flexibly, said movable leaf spring being a gimbal spring which comprises a mounting portion to be supported



by the suspension arm, a head supporting portion for mounting said magnetic head, an intermediate portion disposed between said mounting portion and said head supporting portion, first bridge means connecting said mounting portion and said intermediate portion and supporting said intermediate portion angularly and movably and second bridge means connecting said intermediate portion and said head supporting portion and supporting said head supporting portion angularly and movably, wherein a plurality of first slits are formed between said intermediate portion and said mounting portion where said first bridge means is not located and a plurality of second slits are formed between said intermediate portion and said head supporting portion where said second bridge means is not located; and

a flexible printed circuit secured to said head supporting portion for transmitting an electric signal to said magnetic head and comprising lug means formed thereon, said lug means extending from said head supporting portion toward said intermediate portion and contacting said head supporting portion for suppressing a movement of said head supporting portion.

5,463,514

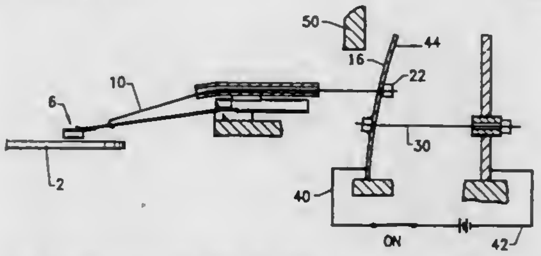
DISC DRIVE SLIDER LIFTER USING SHAPE MEMORY METALS

John R. Yaeger, Santa Clara County, Calif., assignor to Seagate Technology, Inc., Scotts Valley, Calif.

Filed Apr. 5, 1990, Ser. No. 504,964

Int. Cl.^{6} G11B *5/54;21/22*

U.S. Cl. 360—105 **5 Claims**



1. In a slider lifter structure including a flexure arm for use with a data storage device having a frame, at least one rigid rotating disc, a spindle motor for constantly rotating said disc, a power supply for energization of said spindle motor and drive means for moving said flexure arm parallel to a data storage region on a major surface of said disc, said slider lifter structure further including at least one slider supported on the end of said flexure arm for reading and writing data in said data storage region on said major surface of said disc, and a flexure arm support carriage for supporting, moving and positioning said flexure arm and said slider relative to said surface so that said slider may selectively access said data storage region, the improvement in said slider lifter structure comprising:

a resilient leaf spring supported on said frame adjacent said flexure arm, said resilient leaf spring being movable between a first undeformed status and a second deformed status;

a wire running from said resilient leaf spring to said flexure arm supporting said slider;

a shape memory alloy element operatively connected between a fixed region of said frame and said resilient leaf spring, said shape memory alloy element having a martensitic condition and an austenitic condition;

said shape memory alloy element in one of said martensitic and austenitic conditions elastically deforming said resilient leaf spring element from said first undeformed status to said second deformed status to raise said flexure arm and move said slider from a first position resting on said major surface of said disc to a second position displaced a first distance substantially perpendicular to said mayor surface of said disc;

said shape memory alloy element in the other of said martensitic and austenitic conditions permitting said resilient leaf spring to elastically return to said first undeformed status from said second deformed status to lower said flexure arm and move said slider to said first position from said second position; and

bias means for heating said shape memory alloy element to cause said change in state from said martensitic condition to said austenitic condition.

5,463,515

MAGNETIC HEAD SUPPORTING STRUCTURE WITH A BEARING FIXED TO A RADIALLY THIN WALL PART OF A SLEEVE LOCATED BETWEEN AN ARM HOLDER AND THE BEARING

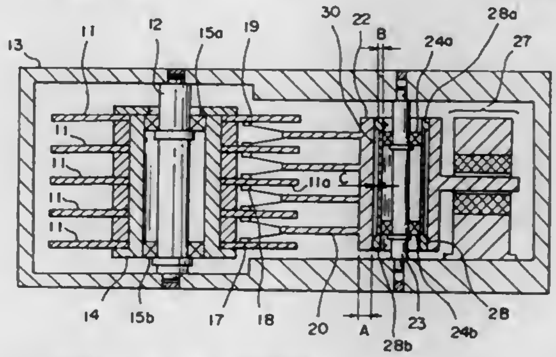
Hiroshi Koriyama, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Nov. 30, 1993, Ser. No. 159,225

Claims priority, application Japan, Nov. 30, 1992, 4-343446

Int. Cl.^{6} G11B *5/55;5/012*

U.S. Cl. 360—106 **20 Claims**



1. A magnetic disk unit comprising:

magnetic disks which are rotatably supported by a disk rotating shaft;

an arm holder which is almost cylindrical, and has head arms corresponding to each of said magnetic disks in the axial direction, and is rotatably supported by a head rotating shaft which is disposed in parallel with said disk rotating shaft with a plurality of bearings disposed therebetween;

magnetic heads which are mounted on the head arms of said arm holder and disposed to face the surfaces of said magnetic disks; and

a cylindrical sleeve which is disposed between said bearings and said arm holder and forms a gap with the inner periphery of said arm holder to absorb a difference of thermal distortions in the radial direction of said arm holder and said bearings, wherein

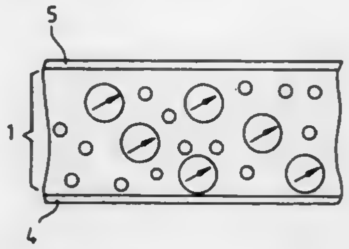
said sleeve has thick wall parts fixed to the inner periphery of said arm holder and a thin wall part between said thick wall parts to form the gap along the entire periphery between the thin wall part of the sleeve and the inner periphery of said arm holder, said thick wall parts each having a radial dimension larger than a radial dimension of said thin wall part, and

the outer peripheries of said bearings are fixed to said thin wall part of the sleeve.

5,463,516

MAGNETORESISTIVE TRANSDUCER OR MAGNETIC READ HEAD INCLUDING A LAYER OF COMPOSITE MATERIAL INCLUDING CONDUCTING MAGNETIC PARTICLES IN AN INSULATING MATERIAL

Thierry Valet, Viroflay, and StéTyc, Paris, both of, France, assignors to Thomson-Csf, Puteaux, France
Filed Jun. 23, 1993, Ser. No. 79,938
Claims priority, application France, Jun. 23, 1992, 92 07626
Int. Cl.^{6} G11B *5/39*
U.S. Cl. 360—113 7 Claims



1. A magnetoresistive transducer, comprising:

a layer of composite material containing a plurality of particles of conducting magnetic material that are distributed in an insulating or semiconducting material;

first and second electrodes contacting the layer of composite material; and

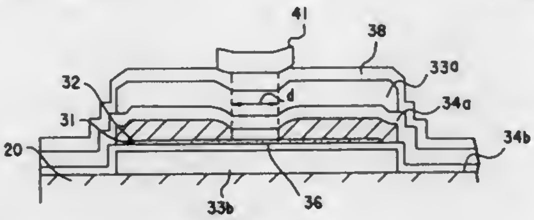
means for applying a bias magnetic field which biases the resistivity of the layer of composite material to a magnetic field level at which change in resistivity of the layer of composite material as a function of magnetic field level is linear;

wherein the plurality of particles of conducting magnetic material comprise a first set of particles that are formed from magnetically hard material, each of the particles of the first set having a magnetization which is insensitive to external magnetic fields, and a second set of particles, each of the particles of the second set having a magnetization which is sensitive to external magnetic fields.

5,463,517

MAGNETORESISTANCE HEAD HAVING A REGULARLY-SHAPED GAP

Junzo Toda, Kawasaki, and Susumu Aoyama, Fukuyama, both of, Japan, assignors to Fujitsu Limited, Kawasaki, Japan
Filed Jan. 28, 1994, Ser. No. 187,680
Claims priority, application Japan, May 17, 1993, 5-114735
Int. Cl.^{6} G11B *5/39;5/127*
U.S. Cl. 360—113 4 Claims



1. A magnetoresistance head comprising:

a magnetoresistance element;

a pair of lead conductor layers connected to ends of said magnetoresistance element so as to define a signal detection area;

upper and lower shields sandwiching said magnetoresistive element and said lead conductive layer;

a first insulating layer residing between the upper shield and the lead conductor layers;

a second insulating layer residing between the lower shield and the magnetoresistance element; and

an upper magnetic pole provided opposite said upper shield via a third insulating layer so as to form a recording gap;

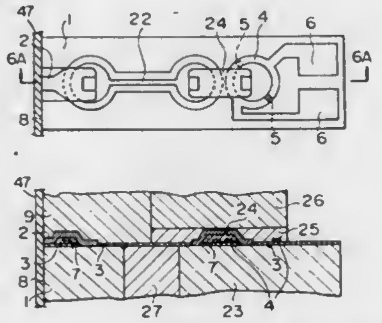
wherein ends of the lead conductor layers, which ends mark the boundaries of said signal detection area, are substantially perpendicular in the vicinity of the magnetoresistance element, and are sloped in the vicinity of the upper shield so that the lead conductor layers become gradually thicker away from the signal detection area, and

wherein said recording gap is a regularly shaped gap at least over a spatial range corresponding to the signal detection area.

5,463,518

MAGNETIC HEAD AND MAGNETIC RECORDING AND REPRODUCING APPARATUS USING A SUPERCONDUCTING QUANTUM INTERFERENCE DEVICE

Shigekazu Otomo, Sayama; Noriyuki Kumasaka, Ome; Kazuo Shiiki, Kanagawa; Takeo Yamashita, Tachikawa; Noritoshi Saito, Miyagi, and Yoshinobu Tarutani, Yamanashi, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Continuation of Ser. No. 184,028, Apr. 20, 1988, abandoned.
This application Mar. 22, 1991, Ser. No. 673,866
Claims priority, application Japan, Apr. 20, 1987, 62-095131; May 27, 1987, 62-128134
Int. Cl.^{6} G11B *5/147;* G01R *33/02;* G01C *21/08*
U.S. Cl. 505—171 30 Claims



1. A thin film magnetic head for at least enabling reproduction of a signal from a magnetic recording medium indicative of information recorded in the magnetic recording medium, the thin film magnetic head comprising:

a magnetic substrate;

an insulating layer formed over the substrate;

a magnetic pole disposed on said substrate, said substrate and magnetic pole having one side thereof facing the magnetic recording medium for guiding magnetic flux of the magnetic recording medium so as to enable reproduction of a signal indicative of information recorded in the magnetic recording medium; and

a superconducting quantum interference device for detecting a signal based on the information recorded in the magnetic recording medium, said superconducting quantum interference device having a ring made of a superconductive state material including a Josephson junction directly linked to said magnetic pole, said ring being formed over said insulating layer and said magnetic pole overlaps at least a portion of said ring;

wherein said superconductive quantum interference device detects magnetic flux changes as an indication of the information recorded in the magnetic recording medium.

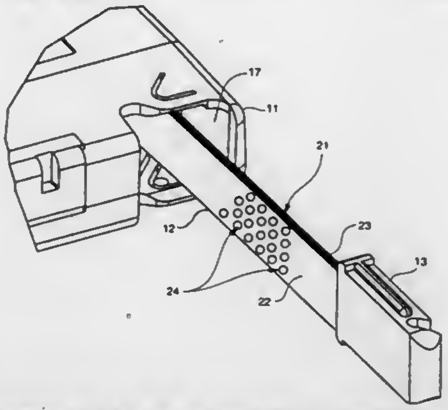
5,463,519

APPARATUS FOR CLEANING A TAPE PATH IN A TAPE DRIVE

William C. Dodt, Broomfield, and Robert D. Stroud, Boulder, both of Colo., assignors to Storage Technology Corporation, Louisville, Colo.

Filed Apr. 14, 1994, Ser. No. 227,442
Int. Cl.⁶ G11B *5/10*

U.S. Cl. 360—128 **11 Claims**



1. A cleaning tape for use in a tape drive to remove debris from elements in the tape path of the tape drive comprising:

a substrate, having a length and a width;

a cleaning agent in liquid form for chemically cleaning said debris from said elements when applied thereto; and

a coating applied to said substrate along its length, for substantially permanently storing said cleaning agent prior to insertion of said cleaning tape into a tape drive and substantially uniformly along substantially the entirety of said length of said substrate, wherein said coating is comprised of a porous material to controllably release said permanently stored cleaning agent from any point along said length of said coating upon the application of pressure to said coating at said point by said elements in said tape path when said cleaning tape is inserted into said tape drive.

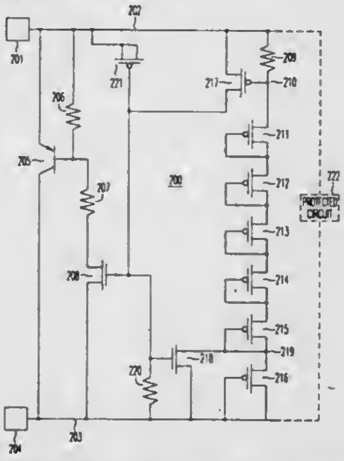
5,463,520

ELECTROSTATIC DISCHARGE PROTECTION WITH HYSTERESIS TRIGGER CIRCUIT

Dale H. Nelson, Shillington, Pa., assignor to AT&T IPM Corp., Coral Gables, Fla.

Filed May 9, 1994, Ser. No. 239,632
Int. Cl.⁶ H02H *9/06*

U.S. Cl. 361—56 **12 Claims**



1. An integrated circuit comprising bondpads connected to circuitry, and having a protective transistor connected between two of said bondpads,

and further comprising a string of voltage dropping devices connected between said bondpads and providing a first intermediate node coupled to the control electrode of said protective transistor for allowing the flow of current through said protective transistor when the voltage across said bondpads exceeds a first voltage level;

wherein said integrated circuit further comprises a shorting transistor that conducts so as to effectively remove at least one of the voltage dropping devices from the string when the voltage across said bondpads increases beyond a first voltage level, and said shorting transistor does not conduct when the voltage across said bondpads is reduced below a second voltage level that is less than said first voltage level.

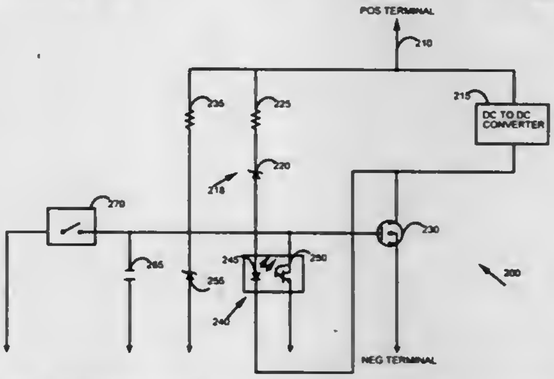
5,463,521

POWER SUPPLY PROTECTION CIRCUIT

W. John Love, Dunlap, Ill., assignor to Caterpillar Inc., Peoria, Ill.

Continuation of Ser. No. 972,337, Nov. 6, 1992, abandoned. This application Jun. 3, 1994, Ser. No. 253,817
Int. Cl.⁶ H02H *9/00;5/04*

U.S. Cl. 361—58 **11 Claims**



1. An apparatus for protecting electronic circuit elements from hazardous voltages produced by an energy source, comprising:

a energy source for producing electrical energy having a predetermined energy level, said energy source having positive and negative terminals;

an electrical load being connected to the positive and negative terminals of said electrical energy source, said electrical load receiving electrical energy from said energy source;

a first Zener diode for receiving electrical energy from said electrical energy source and producing an overvoltage signal in response to receiving electrical energy greater than the breakdown voltage of the first Zener diode;

an NMOSFET for controllably regulating the electrical current flowing through said electrical load, said NMOSFET having a drain, gate, source and substrate, and being connected between the negative terminal of said energy source and said electrical load; and

control means for receiving the overvoltage signal and responsively limiting the NMOSFET gate-source voltage to increase the impedance of said NMOSFET to a predetermined impedance level, thereby limiting the current flowing through said electrical load to protect said electrical load from hazardous voltages, wherein said NMOSFET remains conducting to allow said electrical load to receive electrical energy from said energy source at substantially the breakdown voltage of said first Zener diode during a hazardous voltage condition.

5,463,522

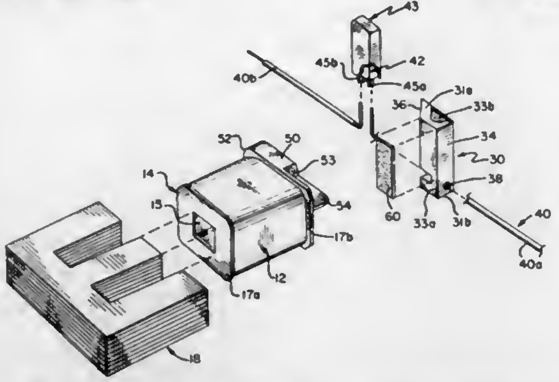
HOUSING AND MOUNTING ARRANGEMENT FOR THERMAL PROTECTOR DEVICE

Raymond H. Van Wagener, Darien, Conn.; Lothar Freimuth, Franklin Lakes, and Michael A. Stein, Wayne, both of N.J., assignors to MagneTek, Inc., Los Angles, Calif.

Filed Jul. 27, 1993, Ser. No. 98,471

Int. Cl.^{6} H02H *5/04*

U.S. Cl. 361—103 **13 Claims**



1. The combination comprising:

an electrical thermal protector device in a metal container having top and bottom ends for use with an electrical unit, a lead wire having one of its ends connected to said thermal protector at one of said container top and bottom ends, the other end of said lead wire adapted for connection for supplying current to the unit,

a housing of electrical insulating material having front and back walls, and only one side wall and at least one of an upper and lower wall connecting said front and back walls to form a hollow housing with an open area opposite said one side wall, said open area having a length at least equal to the distance between said protector device metal container top and bottom ends and through which said protector device metal container is placed into said housing, the thermal protector device container fitting within said hollow housing with a portion of its metal container exposed through and extending outwardly of said housing open area,

an opening in said one side wall through which said lead wire other end extends.

5,463,523

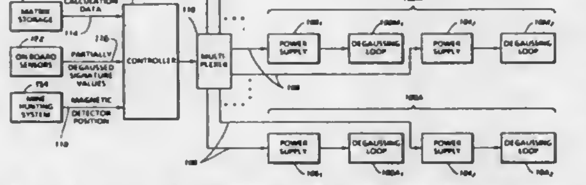
ZERO FIELD DEGAUSSING SYSTEM AND METHOD

John J. Holmes, Jessup, and Milton H. Lackey, Laurel, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 1, 1993, Ser. No. 115,075

Int. Cl.^{6} B63G *9/06*; **H01F** *13/00*

U.S. Cl. 361—149 **9 Claims**



8. In a system for controlling off-board magnetic fields of a marine vessel by a plurality of degaussing coils in response to current control signals, controller means for processing input data to determine said current control signals in accordance with a least squares minimization routine, data collecting means connected to said controller means for supply of the input data thereto relating to geographic position and heading of the vessel and one specific location thereof, underwater magnetic detector means for establishing said one specific location for the vessel, and means operatively connecting the controller means to the degaussing coils for distributing the current control signals thereto from the controller means.

5,463,524

PRODUCING ELECTROSUSPENSIONS

Stephen G. Szirmai, Northbridge, Australia, assignor to Commonwealth Scientific and Industrial Research Organisation, Campbell, and Auspharm International Limited, Perth, both of, Australia

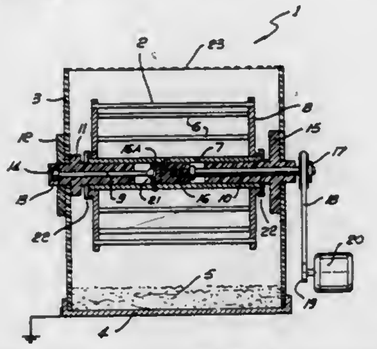
PCT No. PCT/AU90/00339, § 371 Date Mar. 10, 1992, § 102(e) Date Mar. 10, 1992, PCT Pub. No. WO91/23914, PCT Pub. Date Feb. 21, 1991

PCT Filed Aug. 9, 1990, Ser. No. 834,521

Claims priority, application Australia, Aug. 10, 1989, PJ-5702

Int. Cl.^{6} H01H *19/00*

U.S. Cl. 361—230 **23 Claims**



21. A method for use in producing an electro-suspension of micronized particles, the method comprising the steps of:

applying an electric field transversely across a bed of said particles and a region adjacent one surface thereof by rotating an electrode near the bed; and

irradiating said one surface with ions of a polarity naturally propelled toward said one surface by the electrical field such that secondary ionization of air or gases within the bed of said particles occurs sufficient to allow electro-suspension of said particles.

5,463,525

GUARD RING ELECTROSTATIC CHUCK

Michael S. Barnes, San Francisco, Calif.; John H. Keller, Newburgh, N.Y.; Joseph S. Logan, Jamestown, R.I.; Robert E. Tompkins, Pleasant Valley, and Robert P. Westerfield, Jr., Montgomery, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 20, 1993, Ser. No. 169,932

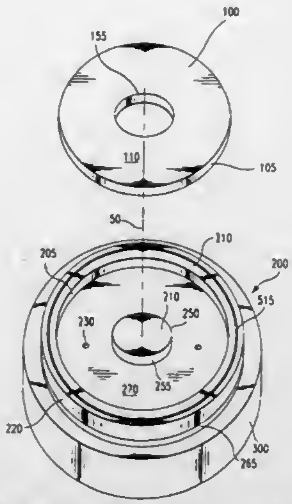
Int. Cl.^{6} H02N *13/00*

U.S. Cl. 361—234 **12 Claims**

1. An electrostatic chuck system for holding, in a vacuum ambient, by electrostatic attraction of a DC potential a workpiece having a workpiece radius comprising: at least two circularly symmetric, concentric aluminum electrodes having a hard-coat alumina coating and together providing a planar clamping surface, at least one of said aluminum electrodes having gas feed means therein, characterized in that:

an outer electrode of said at least two circularly symmetric, concentric aluminum electrodes has an electrode outer radius less than said workpiece radius by a guard ring distance;

said outer electrode is surrounded by a conductive guard ring having a guard ring outer radius less than said workpiece radius by an overhang amount, having a guard ring top surface substantially coplanar with said planar clamping surface and being dielectrically isolated from and capacitively coupled to said outer electrode and to said workpiece, whereby said guard ring suppresses vacuum arcs between said



workpiece and said outer electrode by establishing a equipotential area substantially equal in potential to said workpiece between said workpiece and said outer electrode.

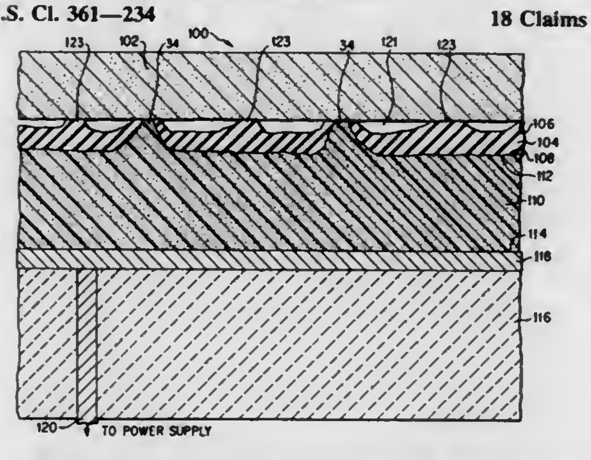
5,463,526
HYBRID ELECTROSTATIC CHUCK

Randall S. Mundt, Pleasanton, Calif., assignor to Lam Research Corporation, Freemont, Calif.

Filed Jan. 21, 1994, Ser. No. 184,707

Int. Cl.^{6} H02N ***13/00***

U.S. Cl. 361—234 **18 Claims**



1. An electrostatic chuck for electrostatically attracting and holding an object, comprising:

a first layer having top and bottom surfaces, the first layer consisting essentially of an insulating material for attracting and supporting such object on its top surface;

a second layer having upper and lower surfaces, the second layer consisting essentially of a semiconducting material, the upper surface of the second layer being in contact with the bottom surface of the first layer;

an electrode formed on the lower surface of the second layer;

supporting means for supporting the first layer, the second layer and the electrode; and

electrical connection means for connecting an electric potential between the object and the electrode;

whereby an attractive electrostatic force will be generated between the object and the chuck.

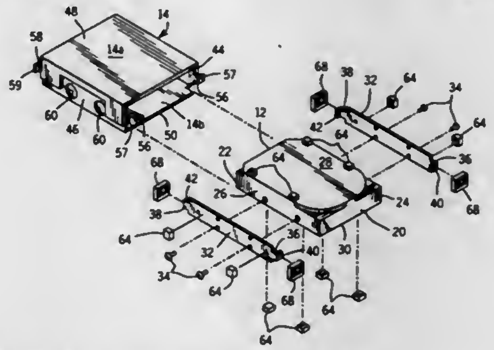
5,463,527
SUSPENSION SYSTEM FOR DISK DRIVES UTILIZING SHEAR LOADED ELASTOMERIC SUPPORTS OF DIFFERENT DUROMETER HARDNESSES AND ELASTOMERIC PADS

Robert J. Hager, Streetsboro; Warren K. Gibson, Eastlake, and Oral G. Lyons, Bay Village, all of Ohio, assignors to Allen-Bradley Company, Inc., Milwaukee, Wis.

Filed Oct. 6, 1993, Ser. No. 132,550

Int. Cl.^{6} G06F ***1/16;*** **F16M** ***13/00;*** **H05K** ***7/12***

U.S. Cl. 361—685 **10 Claims**



1. A disk drive support system comprising:

a support housing;

a disk drive;

a plurality of elastomeric mounts extending between said support housing and said disk drive, each said mount including:

a first portion for fixation to said support housing;

a second portion for fixation to said disk drive; and

a third portion spanning said first portion and said second portion,

wherein said third portion engages sides of said first and second portions so that no elastomeric material of the mount exists between said first and second portions, thereby requiring a force acting between said first and second portions to include at least some component of force acting in shear; and

a plurality of elastomeric pads positioned between but not spanning confronting surfaces of said support housing and said disk drive.

8. An elastomeric support system for a disk drive, comprising:

a housing having four corners;

four drive tangs rigidly affixed to a disk drive positioned within said housing, each of said drive tangs being adjacent to a different one of said four corners; and

four elastomeric mounts, each said mount affixed to a different one of said four corners at a housing connection zone and being affixed to an adjacent drive tang at a drive connection zone, wherein one or more voids are formed in each said mount such that any straight line path through said mount between said connection zones is interrupted by at least one of said voids;

wherein (a) said housing is oriented so that each said mount extends vertically in the direction between its connection zones, (b) two of said mounts extend above said disk drive and two of said mounts extend below said disk drive, and (c) said two mounts which extend above said disk drive are of a higher durometer hardness than said two mounts which extend below said disk drive.

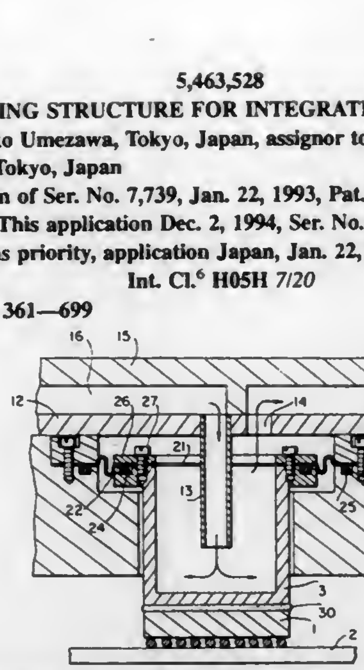
5,463,528

COOLING STRUCTURE FOR INTEGRATED CIRCUITS

Kazuhiko Umezawa, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Division of Ser. No. 7,739, Jan. 22, 1993, Pat. No. 5,390,076.
This application Dec. 2, 1994, Ser. No. 348,488
Claims priority, application Japan, Jan. 22, 1992, 4-31634
Int. Cl.⁶ H05H *7/20*

U.S. Cl. 361—699 **9 Claims**



3. A cooling structure for integrated circuits, comprising:

a plurality of integrated circuits;

a wiring substrate for mounting said plurality of integrated circuits;

a plurality of cylindrical pistons each having an open upper portion formed with a flange and a flat lower surface portion which is in thermal contact with a heat radiating surface of a corresponding one of said integrated circuits;

a housing having holes formed correspondingly in position to respective said integrated circuits for receiving said pistons respectively;

a thin disc spring fixedly secured to each said piston through said flange and to said housing by means of screws;

a plurality of nozzles each for jetting a liquid coolant through said open upper portion of each piston into a bottom surface thereof; and

a cover member fixedly secured to said housing and having coolant passages for supplying said liquid coolant to said nozzles and discharging said liquid coolant jetted through said nozzles outwardly of said pistons.

5,463,529

HIGH POWER DISSIPATING PACKAGES WITH MATCHED HEATSPREADER HEATSINK ASSEMBLIES

Chok J. Chia, Campbell; Manian Alagaratnam; Qwai H. Low, both of Cupertino, and Seng-Sool Lim, San Jose, all of Calif., assignors to LSI Logic Corporation, Milpitas, Calif.

Continuation of Ser. No. 23,981, Feb. 26, 1993, Pat. No. 5,353,193. This application Oct. 4, 1994, Ser. No. 317,968
Int. Cl.⁶ H05K *7/20*

U.S. Cl. 361—704 **28 Claims**

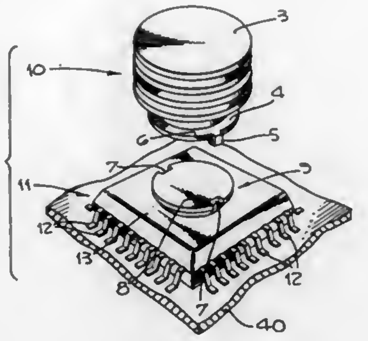
1. An electronic assembly, comprising:

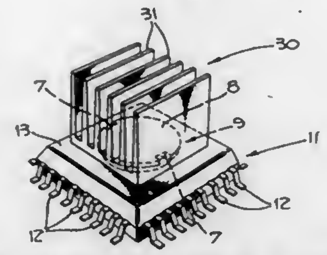
a packaged electronic device; and

a heatsink assembly for radiating heat away from said device, including:

a removable heatsink unit having at least one fin and a coupling collar;

a heatspreader having a platform, at least one tab and an inner collar, said platform being attached to said inner collar and said tab being disposed along the periphery of said platform, said heatspreader adapted to be in thermal contact with the packaged electronic device and adapted to receive a portion of said coupling collar of said heatsink unit within said tab such that when said heatsink unit is turned, said coupling collar removably engages said platform of said heatspreader, thereby removably coupling said heatsink unit to said heatspreader.





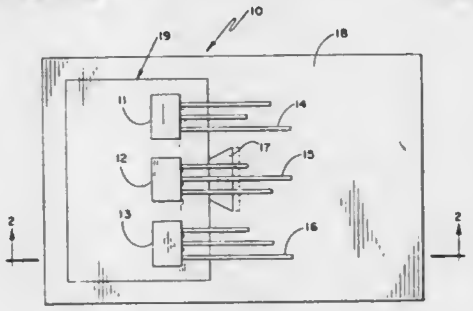
5,463,530

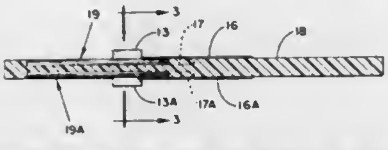
DUAL SIDED LAMINATED SEMICONDUCTOR MOUNTING

David C. DeGree, Burnsville, Minn., assignor to The Bergquist Company, Minneapolis, Minn.

Continuation of Ser. No. 14,475, Feb. 5, 1993, abandoned.
This application Feb. 28, 1994, Ser. No. 203,709
Int. Cl.⁶ H05K *7/20*

U.S. Cl. 361—707 **20 Claims**





1. A heat-dissipating structure for fixably carrying laminated electronic device mounting structures in back-to-back arrangement comprising:

(a) a substantially flat thermally conductive central support member defining a pair of substantially parallel oppositely disposed spaced surfaces;

(b) wherein said central support member contains one or more recesses arranged in each of said oppositely disposed surfaces in generally back-to-back relation, each of said one or more recesses having a surface and being configured to accommodate an electronic device mounting structure of matching shape in a keyed mating, locking relation, the device mounting structure locking in situ in a predetermined position upon insertion in one of said recesses; and

(c) said central support member further including conductive printed circuitry on at least one surface thereof arranged to abut with matching circuitry on a device mounting structure when locked in situ in one of said recesses.

5,463,531

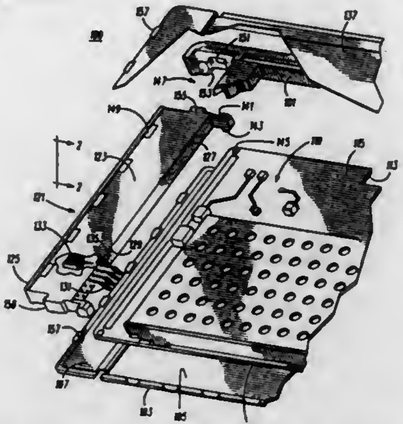
PCMCIA ELECTRONICS HOUSING

Los P. Choon, and Brian Redman, both of Richmond, Canada, assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 5, 1994, Ser. No. 270,354

Int. Cl.^{6} H05K *1/14*

U.S. Cl. 361—737 **13 Claims**



1. An electronics housing that is compliant with a type II PCMCIA standard, the housing comprising in combination:

a frame;

a first cover, coupled to said frame, having an interior surface that is substantially planar and an interface surface that is disposed parallel to said interior surface and spaced at an offset dimension, said offset dimension conforming to the type II PCMCIA standard;

a carrier, having a first side and a second side, said first side disposed adjacent to said interior surface and said second side substantially uniformly spaced from said first side by a thickness dimension and arranged to secure and inter couple an electronic circuit;

a connector further including

a body disposed adjacent to said interface surface and further including a first surface, a second surface, and a plurality of openings, said first surface and said second surface disposed substantially perpendicular to said interface surface, said plurality of openings extending through said body from said first surface to said second surface, and

a plurality of terminals each including a receptacle and an integral contact, said receptacle disposed within said opening, said integral contact extending from said second surface and formed to be mechanically coupled to said second side of said carrier;

a second cover, coupled to said frame and spaced at a height dimension from said first cover, for enclosing and protecting said electronic circuit, said height dimension conforming to the type II PCMCIA standard.

5,463,532

ELECTRICAL CIRCUIT CARD WITH EMI SHIELDING STRIP ADAPTED TO MAKE CONTACT WITH NON-OUTWARDLY FACING SURFACE OF CARD-RECEIVING HOUSING

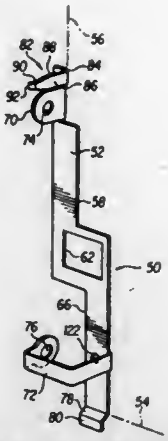
Eric M. Petitpierre, Westminster, Md., and John E. Holmes, Woodbridge, Va., assignors to Hubbell Incorporated, Orange, Conn.

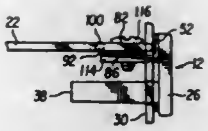
Filed Apr. 15, 1994, Ser. No. 227,887

Int. Cl.^{6} H05K *7/14;9/00*

U.S. Cl. 361—800 **20 Claims**

1. An electrical assembly characterized by reduced emission of electromagnetic interference, comprising:





a grounded, electrically conductive housing for receiving a plurality of insertable circuit cards, said housing having a horizontally extending front opening for receiving said circuit cards vertically in a side-by-side manner, outwardly facing surfaces above and below said front opening, and non-outwardly facing surfaces; and

at least one electrical circuit card received in said housing, said circuit card comprising:

an insulative circuit board having a front edge, a rear edge, longitudinally extending side edges, and a generally planar surface having electrical circuitry thereon;

an insulative faceplate coupled to said circuit board along the front edge thereof and adapted to lie generally vertically across said front opening of said housing when said circuit card is received in said housing; and

an electrically conductive shunt carried by at least one of said circuit board and said faceplate, said electrically conductive shunt comprising an intermediate portion extending generally vertically along the rear surface of said faceplate, and upper and lower contacts adapted to be brought into contact with said housing when said circuit card is inserted into said housing, at least one of said upper and lower contacts being adapted to be brought into contact with a non-outwardly facing surface of said housing bordering to said front opening when said circuit card is inserted into said housing, and at least one of said upper or lower contact and said non-outwardly facing surface being resiliently deflected by the other when brought into such contact.

5,463,533

VARIABLE DEPTH LOAD CENTER ENCLOSURE

Leonard Donnerstag, deceased, late of Atlanta, and Rory Donnerstag, executor, Lawrenceville, both of Ga., assignors to Siemens Energy & Automation, Inc., Alpharetta, Ga.

Filed Jun. 24, 1994, Ser. No. 265,487

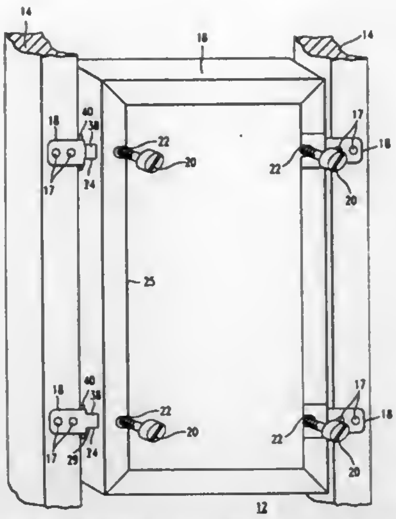
Int. Cl.^{6} H02B *1/06;* H02G *3/12*

U.S. Cl. 361—825 **18 Claims**

16. An adjustable depth load center electrical enclosure, comprising:

a load center enclosure having opposing sides, a back and a front, said enclosure having a "T" shaped formed-in-place knockout slot in at least two of said opposing sides thereof, said "T" shaped slots having their length extending from said front to said back of said enclosure, said enclosure further having a flange disposed on at least one of said opposing sides and adjacent said front, said flange have an interior side facing said back of said enclosure and an opposing second side, said flange further having at least one recess therein;

at least two elongate mounting brackets each of which extends through each said "T" shaped slots and having a first portion at one end thereof for affixing said enclosure to a wall element, an opposing end and a narrow portion disposed intermediate of said first one end and said opposing end, said narrow portion comprised of at least two opposing notches,

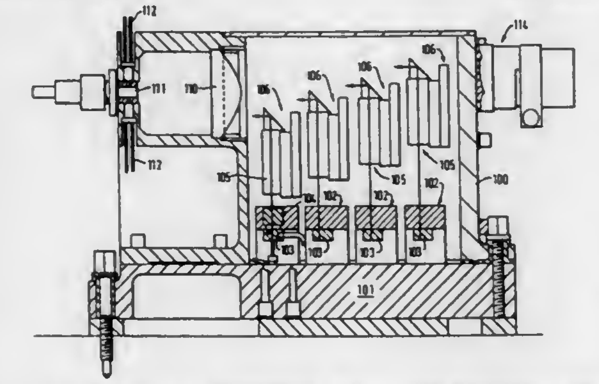


wherein said opposing notches are slidably disposable in said slot such that when said brackets are attached to the wall element, said enclosure is moveable with respect to said brackets in a direction between said back and said front of said enclosure; and

an adjustment mechanism comprised of a threaded bolt having a first head at one end thereof and a second head axially disposed from said first head, said second head disposed adjacent said interior side of said flange and said first head is adjacent said opposing second side of said flange such that said threaded bolt is rotatably retained by said recess and wherein the end of said bolt axially disposed from said first head being rotatably attached to said opposing end of each said bracket whereby rotation of said adjustment mechanism moves said enclosure with respect to said mounting brackets.

5,463,534
HIGH POWER LIGHT SOURCE

Anthony Raven, Royston, England, assignor to Diomed Limited, Cambridge, England
Continuation of Ser. No. 829,037, Jan. 31, 1992, Pat. No. 5,319,528. This application Mar. 24, 1994, Ser. No. 194,109
Claims priority, application United Kingdom, Aug. 1, 1990, 9016857; Sep. 26, 1990, 9020904
Int. Cl.^{6} F21V *7/04*
U.S. Cl. 362—32 **12 Claims**



1. A light source for transmitting light to a predetermined target area within a certain light acceptance solid angle associated with the target area, said light source comprising:

a plurality of stripe-shaped light sources, each said stripe-shaped source having a long dimension and a short dimension and emitting a beam of light having a cross-section with an x-axis width and a y-axis width corresponding respectively to said long and short stripe-shaped source dimensions;

said light source further comprising:

imaging means for producing images of said stripe-shaped sources substantially within said target area, with said beams converging onto said target area and occupying substantially different regions within said target area acceptance angle, and with a resulting anamorphic ratio between the magnification of each said stripe-shaped source in its short dimension and in its long dimension being greater than one;

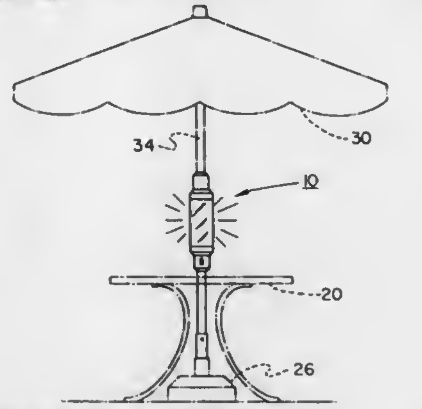
said imaging means comprising:

anamorphic means for forming each said laser diode beam into a collimated beam having its x-axis width increased relative to its y-axis width; and

means arranged downstream of said anamorphic means for focusing said collimated beams onto said target area, said focusing means having substantially equal focal lengths in said x and y axes.

5,463,535
UMBRELLA POST LIGHT

William C. Vest, 380 Lake Shore Dr. #27, Shelby, Ala. 35143
Filed Sep. 22, 1994, Ser. No. 310,346
Int. Cl.^{6} A45B *3/02*
U.S. Cl. 362—102 **11 Claims**



1. An umbrella post light comprising;

a main body having a lower end cap spaced from an upper end cap:

lighting means interposed between said upper and lower end caps for creating and dispensing light exteriorly of said main body;

a lower post coupler extending from said lower end cap;

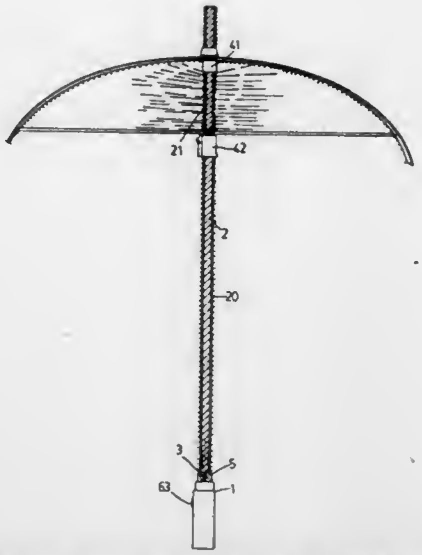
an upper post coupler extending from said upper end; and

a substantially tubular support post coupled to said lower post coupler, said support post being coupled to a base coupler, with said base coupler being couplable to a weighted base positioned beneath a table such that said lighting means is positioned above said table, whereby said table and items residing thereon can be illuminated by said lighting means.

5,463,536
UMBRELLA WITH A LIGHT SOURCE AND LIGHT REFRACTING MEANS

Luk Chou, No. 1, Alley 9, Lane 250, Sec 2, Cheng Gung Rd., Nei Hu Area, Taipei; Jonathan Cheng, 5F., No. 10, Lane 169, Sec 1, Ta-an Rd., Taipei, and Chin I. Lin, No. 23, Jui Yuan Area, Ta Hsi City Taoyuan Hsien, all of, Taiwan, Prov. of China
Filed Feb. 28, 1995, Ser. No. 396,437
Int. Cl.^{6} A45B *3/02*
U.S. Cl. 362—102 **7 Claims**

1. An umbrella comprising a shaft, a handle securely fixed to one end of said shaft, a fixed ring and a runner respectively mounted around said shaft, a plurality of ribs respectively hinged to said fixed ring, an umbrella cover stretched over said ribs, a plurality of stretchers respectively hinged between said runner and



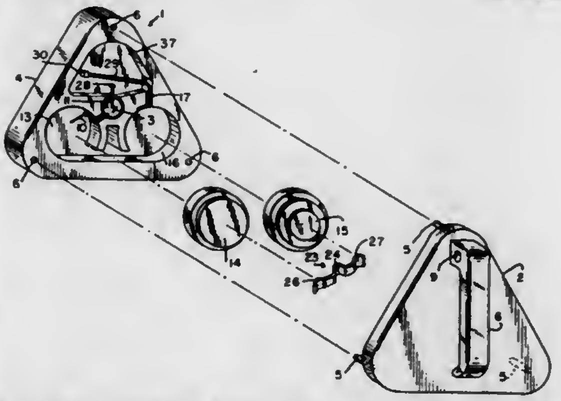
said ribs, a power control unit mounted on said handle, and a light source mounted inside said handle and controlled to give off light, wherein a refractor is mounted on said shaft around said light source to refract the light of said light source out of said handle; said shaft is a transparent, solid, polygonal rod having a refracting area adjacent to said fixed ring for refracting the light of said light source toward the ribs and umbrella cover of the umbrella.

5,463,537
FLASHING LIGHT DEVICE

Burton C. Trattner, 281 E. Skyline Lakes Dr., Ringwood, N.J. 07456, and Wes LeMarr, 79 Hobart Ave., Rutherford, N.J. 07070

Filed Jul. 29, 1994, Ser. No. 282,632
Int. Cl.^{6} F21L *15/14*

U.S. Cl. 362—103 **20 Claims**



1. A device capable of flashing upon movement of said device comprising:

at least one light emitting diode having a first preformed conductor connected to a cathode of said diode and a second preformed conductor connected to an anode of said diode;

first means to provide a power source having a positive terminal and a negative terminal, said negative terminal being connected to said first conductor;

a normally open contact lever having a predetermined spring characteristic and one end thereof coupled to said positive terminal capable of closing a connection to said second conductor adjacent a point on said lever spaced from the other end of said lever resulting in light being emitted from said diode, said lever having a predetermined proximity to said second conductor when at rest; and

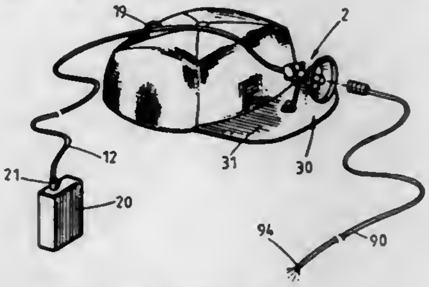
second means having a predetermined weight associated with said lever responsive to movement of said device to cause intermittant closing of of said connection to said second conductor resulting in said diode flashing;

said predetermined spring characteristic, said predetermined weight and said predetermined proximity all being selected to provide a desired increase in switching activity and, hence, a desired increase in flashing when said lever bounces on said second conductor in response of said second means in response to movement of said device.

5,463,538
HEAD MOUNTED WORK LIGHT

Robert C. Womack, 2010 Shea Rd., Dallas, Tex. 75235
Filed Feb. 16, 1994, Ser. No. 197,118
Int. Cl.^{6} F21L *15/14*

U.S. Cl. 362—106 **16 Claims**



1. A portable work light comprising:

a light source comprised of a light bulb mounted within a mounting socket which is slidably disposed within an attachment bracket where said bracket includes a transverse groove formed in said socket and receivable to an attachment arm to prevent the relative rotation of said socket;

a reflector disposed about said socket and bulb where said reflector includes means to focus the light projected by said bulb;

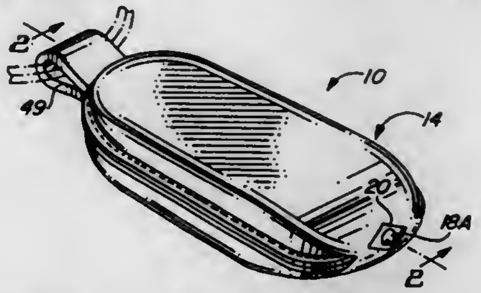
means to mount said light source on a hat or cap including a bill and a crown where said means comprises said attachment arm associated with mounting base, where said base is releasably securable to said hat or cap and where said arm is pivotally oriented with respect to said bracket which is slidably coupled to said socket;

an electrical connector operatively coupled at one end to said mounting socket at the other end to a portable power source.

5,463,539
MINIATURE POCKET FLASHLIGHT WITH LENS MODULE AND OUTER FLEXIBLE SHEATH

Rudy Vandenbelt, Ottawa, Canada, and Peter R. Altman, Austin, Tex., assignors to Lumatec Industries, Inc., Austin, Tex.
Filed Dec. 10, 1993, Ser. No. 165,736
Int. Cl.^{6} F21L *7/00*

U.S. Cl. 362—189 **9 Claims**



1. A miniature pocket flashlight, comprising:

(a) means for generating light including a battery receptacle and electrical switch unit, a lamp at one end mounted to one end of said battery receptacle and electrical switch unit and electrically connected thereto and being operable to emit light and a lens module mounted to said one end of said battery receptacle and electrical switch unit and surrounding said lamp, said lens module including a lens element disposed adjacent and in overlying relation to said lamp and adapted to transmit the light emitted by said lamp; and

(b) an outer sheath of flexible material encasing and covering said battery receptacle and electrical switch unit, said lamp, and said lens module of said light generating means except for an outer end of said lens element of said lens module, said outer sheath having an aperture defined in one end thereof such that only said lens element outer end of said lens module of said light generating means is exposed through said aperture in said one end of said outer sheath, said lamp being disposed internally of said outer sheath and aligned with and spaced from said aperture, said lens element of said lens module extending between said aperture and lamp and having a peripheral shoulder surrounding said outer end thereof and supporting an annular edge portion of said outer sheath which defines said aperture in said one end thereof;

(c) said flexible outer sheath being formed solely by a pair of flexible flaps facing toward one another in an opposing relationship and being integrally connected together solely at said one end of said outer sheath where said aperture is defined, said flexible flaps having peripheral edges extending about said flaps from said one end of said outer sheath and being attached to one another so as to encase and enclose said battery receptacle and electrical switch unit, said lamp and lens element of said lens module, except for said outer end of said lens element of said lens module being exposed through said aperture in said one end of said outer sheath, and thereby retain together said battery receptacle and electrical switch unit, said lamp and said lens module.

5,463,540

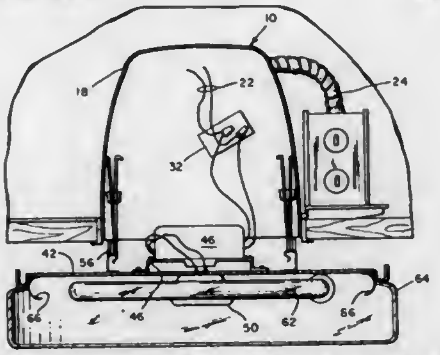
INCANDESCENT TO FLUORESCENT LIGHT CONVERSION KIT

Roy Jones, Whittier, Calif., assignor to CSL Lighting Mfg. Inc., Valencia, Calif.

Filed Mar. 25, 1993, Ser. No. 39,576

Int. Cl.^{6} F21S *3/00*

U.S. Cl. 362—260 **6 Claims**



1. Apparatus for converting an incandescent lighting fixture that is installed in a receptacle/housing, including bracket means that is installed within a ceiling, to a fluorescent fixture comprising:

a. a base plate having an interior surface and an exterior surface;

b. a ballast/transformer assembly mounted to said base plate interior surface;

c. a fluorescent lamp socket mounted to said base plate exterior surface and adapted to be electrically connected to said ballast/transformer assembly;

d. a separable connector assembly electrically coupling said ballast/transformer assembly to the permanent electrical wiring adapted to connect to the incandescent fixture; and

e. spring hangers coupled to said base plate and adapted to attach to the receptacle/housing using existing receptacle/housing structural elements for engaging said base plate in first and second orientations, said first orientation allowing access to the interior of the receptacle/housing above said base plate and said second orientation holding said base plate secure against the receptacle/housing and blocking access to the interior of the receptacle/housing,

whereby an existing receptacle housing for an incandescent light fixture can be adapted to accept a fluorescent light fixture.

5,463,541

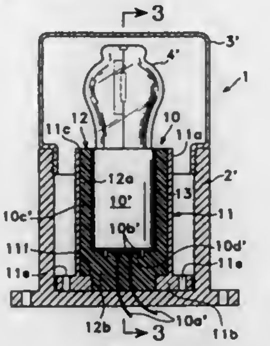
OMNI-DIRECTION VIBRATION DAMPENING LAMPHOLDER ASSEMBLY

Kenneth L. Greene, 20 Cornelia La., Lake Grove, N.Y. 11755

Filed Sep. 10, 1992, Ser. No. 943,033

Int. Cl.^{6} F21V *15/04*

U.S. Cl. 362—369 **5 Claims**



1. An omni-direction vibration dampening lampholder assembly for a lighting structure, said lampholder assembly comprising

a housing member selectively attachable to a lighting structure, said housing member comprising a hollow upper portion and a base plate portion, a top end and a bottom end of said housing member being open;

a resilient body disposed in said housing member, an upper portion of said resilient body being co-extensive with the upper portion of said housing member and having a lampholder cavity formed therein, a lower portion of said resilient body having a deformation opening formed therein and disposed adjacent to the open bottom end of said housing member; and

a lampholder disposed in the cavity of said resilient body, side walls and a bottom wall of said lampholder being fully encased within said resilient body,

said resilient body being selectively displaceable from said housing member for vibration dampening by displacement of the lower portion of said resilient body through the open bottom end of said housing member and by displacement of the upper portion of said resilient body through the open top end of said housing member thereby maintaining said lampholder and a lamp disposed therein in consistent relative displacement.

5,463,542

DC/DC CONVERTER AND RS-232 INTERFACE CIRCUIT USING THE SAME

Kouhei Okamoto, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 31,900, Mar. 16, 1993, abandoned. This application Feb. 1, 1995, Ser. No. 383,685

Claims priority, application Japan, Mar. 17, 1992, 4-060587

Int. Cl.^{6} H02M *3/18*

U.S. Cl. 363—60 **3 Claims**

1. A DC/DC converter, comprising:

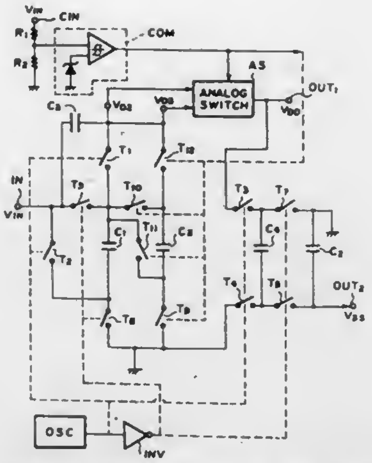
an input terminal supplied with an input voltage;

a first output terminal;

a reference terminal;

first, second, third, fourth and fifth nodes;

a first capacitor connected between said input terminal and said first node;



a second capacitor connected between said second and third nodes;

a third capacitor connected between said fourth and fifth nodes;

a first switch connected between said first and second nodes;

a second switch connected between said input terminal and said second node;

a third switch connected between said input terminal and said third node;

a fourth switch connected between said third node and said reference terminal;

a fifth switch connected between said first and fourth nodes;

a sixth switch connected between said second and fourth nodes;

a seventh switch connected between said second and fifth nodes:

an eighth switch connected between said fifth node and said reference terminal;

a control node supplied with a control signal which takes a first logic state in a first mode and a second logic state in a second mode;

means for operating in said first mode to control said first through eight switches such that a first voltage is produced at said first output terminal and in said second mode to control said first through eighth switches such that a second voltage is produced at said second output terminal, said first voltage assuming a first level which is two times as large as said input voltage and said second voltage assuming a second level which is three times as large as said input voltage means; and

means for transferring said first voltage to said first output terminal in said first mode and said second voltage to said first output terminal in said second mode.

5,463,543

CONTROL SYSTEM INCORPORATING A FINITE STATE MACHINE WITH AN APPLICATION SPECIFIC LOGIC TABLE AND APPLICATION INDEPENDENT CODE

Ferdinand H. Wagner, Wheaton, Ill., assignor to Janusz A. Dobrowolski, Wheaton, Ill.

Continuation of Ser. No. 693,936, Apr. 29, 1991, Pat. No. 5,301,100. This application Mar. 28, 1994, Ser. No. 219,194

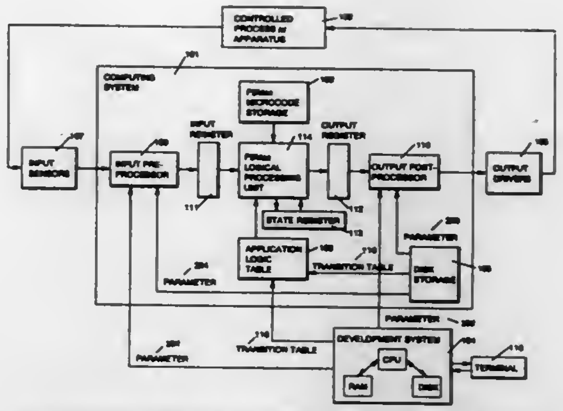
Int. Cl.^{6} G05B *11/01*

U.S. Cl. 364—141 25 Claims

3. A control system for a process or apparatus comprising:

a. preprocessing means for deriving input names corresponding to input conditions from input signals,

b. a logic unit, which incorporates an application logic table and separate, application independent, control code wherein said logic unit executes said control code and in response to said input names, uses said application logic table to produce output names representing at least one control action which controls the process or apparatus, and



c. post processing means responsive to said output names for producing said control action.

5,463,544

PROGRAMMABLE CONTROLLER AND METHOD OF MONITORING A SEQUENCE PROGRAM THEREOF

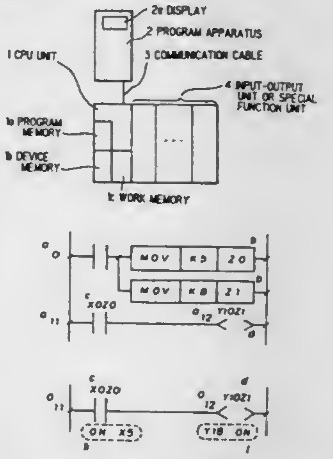
Shun Ohta, Nagoya, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 861,021, Mar. 31, 1992, abandoned. This application Sep. 16, 1994, Ser. No. 307,029

Claims priority, application Japan, Apr. 1, 1991, 3-068456; Jan. 21, 1991, 3-272387

Int. Cl.^{6} G06F *9/00;* G05B *19/05*

U.S. Cl. 364—147 19 Claims



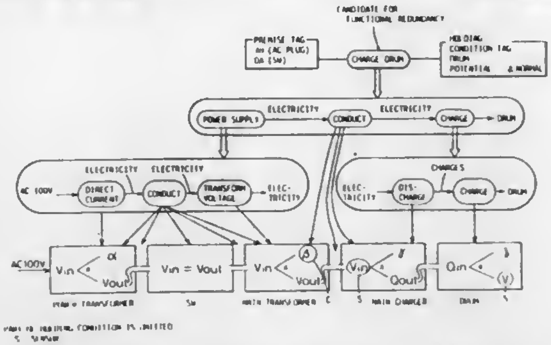
1. A programmable controller comprising a CPU unit, a work memory coupled to said CPU unit, a program memory coupled to said CPU unit and program apparatus means, said programmable controller being operated by a sequence program stored in said program memory and executable in a sequence of steps by said CPU unit and controlling the condition of a plurality of devices,

said program apparatus means monitoring a device condition during execution of said sequence program by said CPU unit and comprising display means for displaying an arbitrary sequence step in said sequence program, and

said CPU unit comprising transmission means for transmitting to said display means information concerning an arbitrary device having index qualification for a subroutine in said program apparatus and a condition of said arbitrary device during execution of the programmed sequence program, said information being stored in said work memory and comprising an index qualification contents value and status of said arbitrary device.

5,463,545
FUNCTIONAL REDUNDANCY CONTROL SYSTEM

Yasushi Umeda, Chofu; Tetsuo Tomiyama, Chiba; Hiroyuki Yoshikawa, Tokyo, and Yuichi Koike, Tokorozawa, all of, Japan, assignors to Mita Industrial Co., Ltd., Japan
Continuation of Ser. No. 989,511, Dec. 11, 1992, abandoned.
This application Feb. 23, 1995, Ser. No. 393,244
Claims priority, application Japan, Dec. 19, 1991, 3-336733
Int. Cl.^{6} G06F *19/00;11/16*
U.S. Cl. 364—187 **21 Claims**



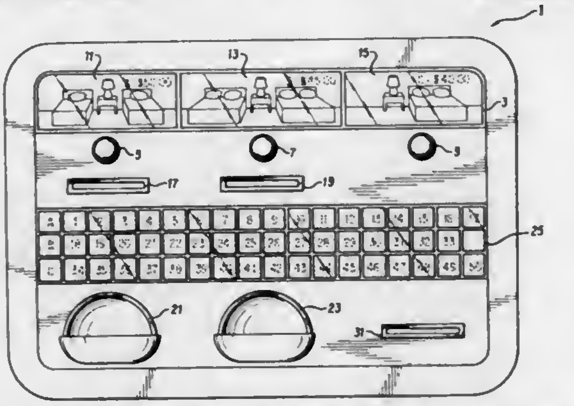
1. A function redundancy control system for an apparatus including a plurality of elements controllable by a control means, each of said plurality of controllable elements having ability to perform a predetermined function inherently required in the apparatus, said system comprising:

retrieving means for determining whether controllable elements of said plurality are controllable to perform a potential function which is substantially the same as a predetermined inherent function of another one of said plurality of controllable elements and which potential function is not ordinarily performed, and for identifying controllable elements having said potential function; and

redundancy system control means for causing one of said controllable elements to perform the potential function thereof after said one controllable element has been identified by said retrieving means.

5,463,546
LODGING FACILITY AUTOMATED PROCESSING STATION

Carmenina Parkhurst, P.O. Box 969, Fortuna, Calif. 95540
Filed Sep. 16, 1994, Ser. No. 306,894
Int. Cl.^{6} G06F *153/00*
U.S. Cl. 364—407 **6 Claims**



1. A lodging facility automated processing station for use with a lodging facility having a plurality of different categories of rooms therein and with each room category defining a different room rental rate, said automated processing station including:

a pictorial room display having separate lighted displays therein of at least one representative room of each of the different categories of rooms having different rental rates, and the rental rate for each of the categories of rooms displayed;

a plurality of room category keypad pushbuttons, with each of said room category keypad pushbuttons corresponding to one of said separate lighted displays of said pictorial room display;

each of said room category keypad pushbuttons providing for the selection of one of the categories of rooms and being automatically illuminated according to the availability of the selected room category;

a plurality of individual room keypad pushbuttons, with each of said room keypad pushbuttons corresponding to one room of the lodging facility and further being divided into a plurality of groups each corresponding to one of the categories of rooms and a corresponding one of said room category keypad pushbuttons;

each of said individual room keypad pushbuttons providing for the selection of a specific room of one of the categories of rooms and being automatically illuminated according to the availability of the selected room;

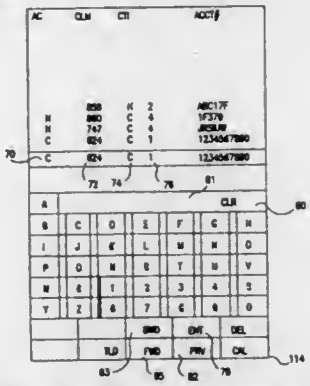
monetary exchange means including at least one monetary acceptance slot, and providing for a monetary transaction to take place between said automated processing station and the user of said station, and;

key dispenser means providing for the dispensing of at least one room key according to the availability of the room selected by the user of said station by means of said room category keypad pushbuttons and said individual room keypad pushbuttons, whereby;

the user of said lodging facility automated processing station selects a room by means of said room category keypad pushbuttons and said individual room keypad pushbuttons according to the room categories and rooms indicated respectively by the illumination of said room category keypad pushbuttons and said individual room keypad pushbuttons, provides payment for the selected room by means of said monetary exchange means, and is provided with a key to the selected room by means of said key dispenser means.

5,463,547
PORTABLE TRADE RECORDATION SYSTEM INCLUDING MEANS FOR ABBREVIATED ENTRY OF DATA

Arthur D. Markowitz, Harrington Park, N.J., and John J. Sabo, Wilton, Conn., assignors to New York Mercantile Exchange, New York, N.Y.
Continuation of Ser. No. 126,109, Sep. 23, 1993, abandoned, which is a continuation of Ser. No. 511,053, Apr. 19, 1990, abandoned. This application Jan. 27, 1995, Ser. No. 384,259
Int. Cl.^{6} G06F *153/00*
U.S. Cl. 364—408 **4 Claims**



1. A method of selectively entering data into one of a plurality of data records displayed on a display screen of a data entry apparatus, comprising the steps of:

(a) displaying an edit area on the display screen containing the plurality of data records, each data record having a plurality of character fields, a plurality of which are more than one character and which are used in a complete transaction;

(b) displaying an entry field on the display screen;

(c) displaying input data entered on the data entry apparatus in said entry field;

(d) transferring input data displayed in said entry field to a character field of a data record of said plurality of data records by direct user indication of said character field on the display screen;

(e) storing completed data records of said plurality of data records in a memory;

(f) removing said completed data records from the edit area of the display screen; and

(g) retaining incomplete data records of said plurality of data records in the edit area of the display screen;

wherein said steps of storing, removing, and retaining are performed upon activation of at least one field.

5,463,548

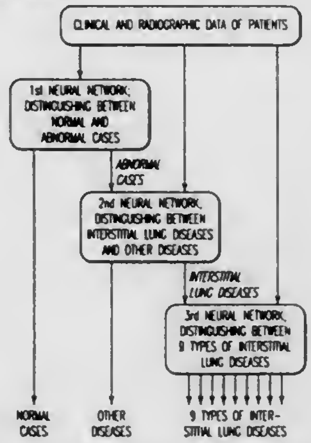
METHOD AND SYSTEM FOR DIFFERENTIAL DIAGNOSIS BASED ON CLINICAL AND RADIOLOGICAL INFORMATION USING ARTIFICIAL NEURAL NETWORKS

Naoki Asada, Higashioji, Japan, and Kunio Doi, Hinsdale, Ill., assignors to Arch Development Corporation, Chicago, Ill.

Continuation of Ser. No. 573,800, Aug. 28, 1990, abandoned. This application Apr. 28, 1993, Ser. No. 53,345

Int. Cl.^{6} G06F *159/00*

U.S. Cl. 364—413.02 **3 Claims**


CLINICAL AND RADIOGRAPHIC DATA OF PATIENTS
1st NEURAL NETWORK; DISTINGUISHING BETWEEN NORMAL AND ABNORMAL CASES
ABNORMAL CASES
2nd NEURAL NETWORK; DISTINGUISHING BETWEEN INTERSTITIAL LUNG DISEASES AND OTHER DISEASES
INTERSTITIAL LUNG DISEASES
3rd NEURAL NETWORK; DISTINGUISHING BETWEEN 9 TYPES OF INTERSTITIAL LUNG DISEASES
NORMAL CASES
OTHER DISEASES
9 TYPES OF INTERSTITIAL LUNG DISEASES

3. A method for differential diagnosis of a plurality of predetermined interstitial lung diseases using an incomplete set of input data, comprising:

selecting a plurality of clinical parameters defining characteristics of a subject;

selecting a plurality of radiographic descriptors comprised of predetermined features obtained from a radiographic chest image defining characteristics of interstitial lung diseases, including at least plural of the following fourteen radiographic descriptors:

distribution of infiltrates in 6 lung zones,

homogeneity, fineness, nodularity, septal lines and honeycombing of said infiltrates, and

lymphadenopathy, pleural effusions and heart size;

forming a complete set of input data comprised by said plurality of clinical parameters and said plurality of radiographic descriptors;

converting said plurality of clinical parameters and said plurality of radiographic descriptors into numerical expressions;

transforming each of said numerical expressions into a number in a predetermined range;

training a neural network comprising a plurality of successive neural networks to identify each of said plurality of predetermined interstitial lung diseases using a database of said complete set of data;

inputting said transformed numerical expressions into said neural network, said input expressions representing incomplete sets of input data;

diagnosing at least one of said plurality of predetermined interstitial lung diseases using said neural network in accordance with said input expressions;

distinguishing between normal and abnormal patterns in said radiographic chest image using a first of said plurality of successive neural networks;

distinguishing between said plurality of predetermined interstitial lung diseases and other diseases using a second of said plurality of successive neural networks; and

distinguishing between said plurality of predetermined interstitial lung diseases using a third of said plurality of successive neural networks.

5,463,549

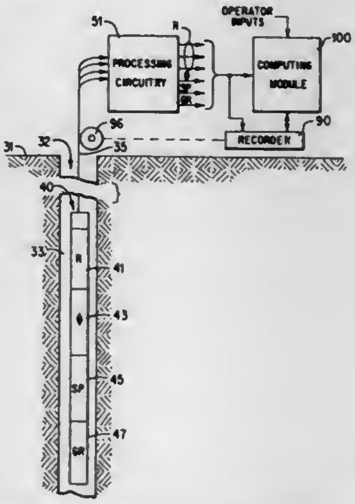
METHOD AND APPARATUS FOR DETERMINING PERMEABILITY OF SUBSURFACE FORMATIONS

Elizabeth B. Dussan V.; François M. Auzerais, both of Ridgefield, and Barbara I. Anderson, Brookfield Center, all of Conn., assignors to Schlumberger Technology Corporation, Ridgefield, Conn.

Filed Oct. 15, 1993, Ser. No. 137,826

Int. Cl.^{6} E21B *47/00*

U.S. Cl. 364—422 **27 Claims**



1. A method for determining the permeability of formations surrounding a borehole drilled in the earth using drilling fluid, comprising the steps of:

suspending a logging tool in the borehole;

producing a plurality of resistivity measurements, having respectively different radial depths of investigation, as said logging device is moved through said borehole, to obtain a plurality of resistivity logs;

determining the presence of a buoyancy marker in said resistivity logs in a formation bed invaded with filtrate from said drilling fluid, and the extent of said buoyancy marker; and

determining permeability of said formations as a function of the extent of said buoyancy marker.

5,463,550

DRIVING AND BRAKING CONTROL OF VEHICLES EQUIPPED WITH A PLURALITY OF SINGLE WHEEL DRIVE AND BRAKE MODULES

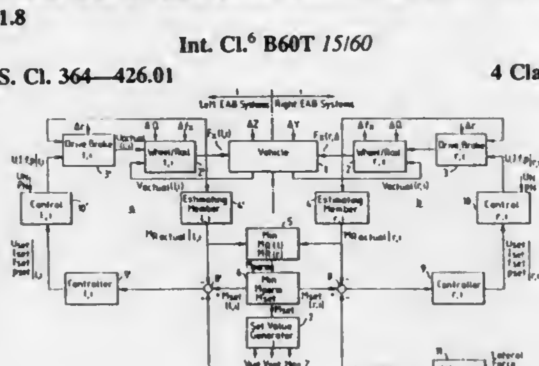
Joachim Körber, Weinheim; Klaus Niemann, Welzheim; Fritz Frederich, Krefeld, and Christian Günther, Haar, all of, Germany, assignors to AEG Westinghouse Transport-Systeme GmbH, Berlin, Germany

Filed Oct. 23, 1992, Ser. No. 964,637

Claims priority, application Germany, Jan. 25, 1991, 41 35 691.8

Int. Cl.^{6} B60T *15/60*

U.S. Cl. 364—426.01 **4 Claims**



1. An apparatus for regulating driving and braking of vehicles having right and left wheels, the apparatus comprising:

at least two single wheel drive and brake unit modules each respectively associated with the respective right and left wheels and each being symmetrically disposed with respect to a plane of the vehicle to form a respective pair of individual single wheel drive and brake unit modules, the modules regulating the driving and braking of the vehicle to affect a guiding function of the respective wheels;

first generator means for generating a set torque value;

at least two torque control processing circuits each being respectively associated with and controlling a respective one of the at least two single wheel drive and brake unit modules, and each including changing means for dynamically changing a degree of coupling of the torque control processing circuits, the changing means comprising means for determining respective estimated actual torque values at the associated wheel from circumferential forces;

coupling means for coupling in pairs the torque control processing circuits, and comprising:

a first minimum value determination stage means for receiving respective right and left wheel estimated actual torque values, forming a minimum value therefrom, and outputting a corresponding permissible torque value; and

a second minimum value determination stage means, for subsequently forming a common minimum set torque value for the respective torque control processing circuits from the permissible torque value and the set torque value;

second generator means for generating respective additional set torque values each with different signs for each torque control processing circuit, representative of any extraneous lateral forces; and

combining means for receiving and combining the respective additional set torque values with the respective common minimum set torque value for the respective left and right torque control processing circuits for producing a controlled transverse slip of the wheels and creating the guiding force to counteract the lateral forces at a point where the wheels contact a traveling surface.

5,463,551

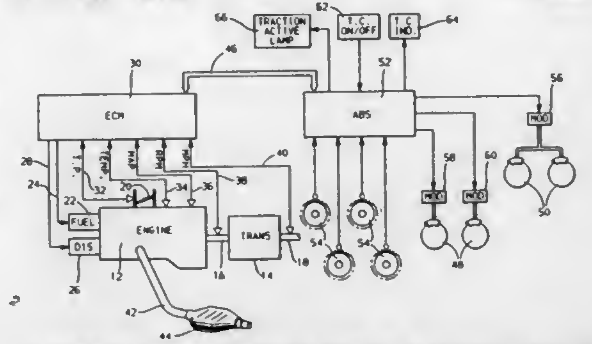
INTEGRATED TRACTION CONTROL SYSTEM

Rimas S. Milunas, Rochester Hills, Mich., assignor to Saturn Corporation, Troy, Mich.

Filed Sep. 2, 1994, Ser. No. 299,986

Int. Cl.^{6} B60K *28/16;* **B60T** *8/58*

U.S. Cl. 364—426.02 **12 Claims**



1. A traction control method for reducing a detected wheel slip condition in driven wheels of an automotive vehicle having an internal combustion engine fueled by a plurality of fuel injectors, wherein fuel admitted to the engine is combusted following ignition signals issued at times corresponding to a spark timing value, comprising the steps of:

determining a slip condition in the driven wheels;

adjusting the spark timing value in a retard direction corresponding to a decreased engine output torque to reduce the determined slip condition;

determining when the adjusted spark timing value exceeds a predetermined limit value;

disabling a predetermined one of the plurality of fuel injectors upon determining that the adjusted spark timing value exceeds the predetermined limit value to decrease engine output torque and reduce the determined slip condition; and

adjusting the spark timing value in an advance direction opposing the retard direction upon disabling the predetermined one of the plurality of fuel injectors to mitigate the decrease in engine output torque resulting from such disabling.

5,463,552

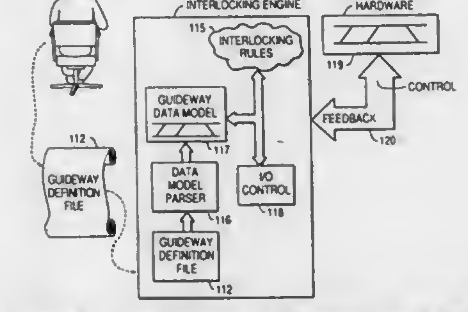
RULES-BASED INTERLOCKING ENGINE USING VIRTUAL GATES

Richard A. Wilson, Jr.; John M. Daubner, and Frank D. Jeffers, all of Pittsburgh, Pa., assignors to AEG Transportation Systems, Inc., Pittsburgh, Pa.

Filed Jul. 30, 1992, Ser. No. 921,756

Int. Cl.^{6} G06F *163/00;* **B61L** *27/00*

U.S. Cl. 364—436 **19 Claims**



1. A method of implementing a computer based interlocking system for protecting trains traversing a guideway system, said guideway system comprising guideways comprised of guideway objects which influence movement of trains in the guideway system, comprising:

providing a data base of prestored rule sets for a plurality of guideway objects, said guideway objects defined by entry and exit points, the entry point to at least one guideway object being a virtual gate, the rule sets defining conditions for a respective guideway object which must be met before entry through a virtual gate of said object is permitted;

inputting a high-level description of a guideway system layout including all of the guideway objects that make up guideways in the guideway system;

processing by a computer implemented interlocking engine the high-level description of the guideway system layout using the prestored rule sets to form an internal guideway data model;

supplying status signals from guideway objects and control requests to said interlocking engine;

processing said status signals and control requests by said interlocking engine in real time with reference to said prestored rule sets and said internal guideway data model; and

outputting control signals denying control requests that would result in unsafe conditions.

5,463,553

NAVIGATION APPARATUS AND NAVIGATION METHOD

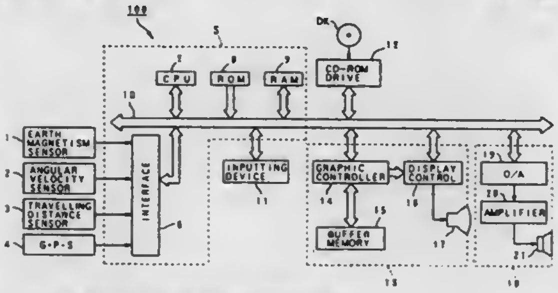
Morio Araki; Katsuyoshi Hayashi, and Yukiko Habu, all of Kawagoe, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jun. 16, 1994, Ser. No. 260,833

Claims priority, application Japan, Jun. 18, 1993, 5-148102

Int. Cl.^{6} G06F *17/00*

U.S. Cl. 364—444 **6 Claims**



1. A navigation apparatus comprising:

a measuring means for measuring a present position of a movable body to output a present position information indicating the measured present position;

a storing means for storing map information;

a displaying means having a display picture plane, for displaying various information on the display picture plane;

a display controlling means for controlling said displaying means to display a target position information, which is set as information indicating a target position, and the present position information on the map information;

a judging means for judging whether a distance between the present position and the target position is within a predetermined value; and

a calculating means for calculating a middle position between the present position and the target position when the judged distance is within the predetermined value according to a judgement by the judging means, to output middle position information indicating the calculated middle position;

said display controlling means controlling said displaying means to display the target position information and the present position information under a condition where a display position of the middle position information is located at a center of the display picture plane when the judged distance is within the predetermined value according to the judgement by the judging means, and to display the target position information and the present position information under a condition where a display position of the present position information is away from the center of the display picture plane by a predetermined distance when the judged distance is not within the predetermined value according to the judgement by the judging means.

5,463,554

VEHICLE NAVIGATION SYSTEM WHICH AUTOMATICALLY ADJUSTS TO A CHANGED TRAVEL ROUTE

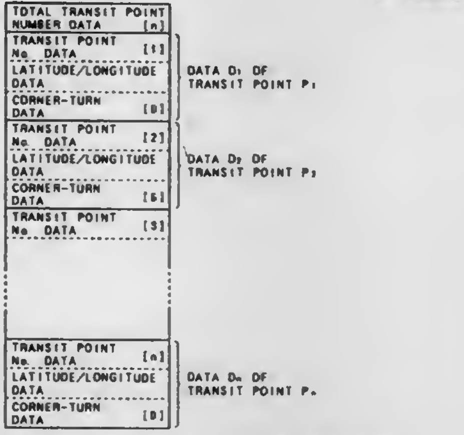
Morio Araki; Katsuyoshi Hayashi, and Yukiko Habu, all of Kawagoe, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jun. 16, 1994, Ser. No. 260,834

Claims priority, application Japan, Jun. 18, 1993, 5-148100

Int. Cl.^{6} G06F *17/00*

U.S. Cl. 364—444 **6 Claims**


TOTAL TRANSIT POINT NUMBER DATA [n]
TRANSIT POINT No. DATA [1]
LATITUDE/LONGITUDE DATA
CORNER-TURN DATA [0]
DATA D1 OF TRANSIT POINT P1
TRANSIT POINT No. DATA [2]
LATITUDE/LONGITUDE DATA
CORNER-TURN DATA [6]
DATA D2 OF TRANSIT POINT P2
TRANSIT POINT No. DATA [3]
TRANSIT POINT No. DATA [n]
LATITUDE/LONGITUDE DATA
CORNER-TURN DATA [0]
DATA Dn OF TRANSIT POINT Pn

1. A navigation system installed in a vehicle comprising:

measurement means for measuring a current position of the vehicle and for outputting current position data;

road map data storage means for storing road map data;

display means for displaying information;

display control means for permitting said display means to display the current position of the vehicle on the basis of the current position data and a road map around the current position of the vehicle on the basis of the road map data;

transit point storage means for storing transit point data representing positions of a plurality of transit points located on a travel route from a start point to a destination and travel order data representing a travel order according to which the vehicle passes the transit points;

guide means for representing guide information relating to the travel route on the basis of the transit point data and the travel order data;

distance calculation means for continuously calculating a transit point distance from the current position, moving according to movement of the vehicle, to the transit point for each of the transit points on the basis of the current position data and the transit point data;

comparison means for comparing the transit point distances with a predetermined reference distance during driving of the vehicle and for detecting a special transit point which transit point distance is smaller than the reference distance; and

target point determination means for determining a target transit point to be passed next according to the travel order on the basis of the travel order data, wherein said target point determination means changes the target transit point to the transit point to be passed subsequently to the special transit point according to the travel order, when said comparison means detects the special transit point during driving of the vehicle.

5,463,555

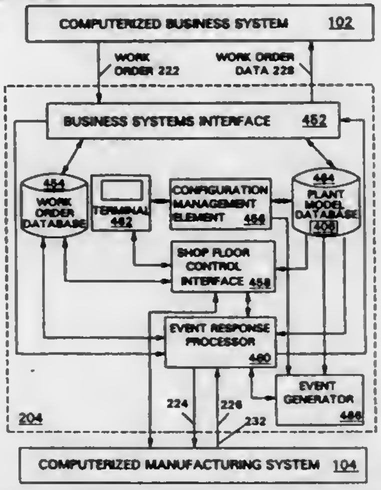
SYSTEM AND METHOD FOR INTEGRATING A BUSINESS ENVIRONMENT WITH A PROCESS CONTROL ENVIRONMENT

Dennis M. Ward, Sherwood Park, Canada; Ronny A. W. Aerts, Kloosterzande; Jean-Pierre Meijer, Malden, both of, Netherlands; Silke Arnswald, Gnarrenburg, Germany; Gerald A. Sandoval, Midland, Mich., and Herbert Schneemann, Stade, Germany, assignors to The Dow Chemical Company, Midland, Mich.

Filed Sep. 28, 1993, Ser. No. 127,876

Int. Cl.^{6} G06F *17/60*

U.S. Cl. 364—468 **42 Claims**


COMPUTERIZED BUSINESS SYSTEM 102
WORK ORDER 222
WORK ORDER DATA 228
BUSINESS SYSTEMS INTERFACE 452
454 WORK ORDER DATABASE
TERMINAL 462
CONFIGURATION MANAGEMENT ELEMENT 464
464 PLANT MODEL DATABASE 406
SHOP FLOOR CONTROL INTERFACE 458
EVENT RESPONSE PROCESSOR 460
EVENT GENERATOR 466
204
224
226
232
COMPUTERIZED MANUFACTURING SYSTEM 104

1. A computer-based system for integrating a computerized business system with a computerized manufacturing system, wherein the computerized business system creates a work order containing data specifying a product to be manufactured by the computerized manufacturing system, comprising:

a business systems interface configured to receive the work order from the computerized business system and to extract the data from the received work order; and

an event response processor coupled to said business system interface and configured to apply at least one rule to said extracted data to generate one or more setpoints, and to provide said one or more setpoints to the computerized manufacturing system, wherein said one or more setpoints are manufacturing process settings used to manufacture the product.

5,463,556

PROCESS AND DEVICE FOR CONTROL OF AN AUTOLEVELING CONTROL FRAME

Peter Denz, Ingolstadt, Germany, assignor to Rieter Ingolstadt Spinnereimaschinenbau AG, Ingolstadt, Germany

Continuation of Ser. No. 74,111, Jun. 8, 1993, abandoned. This application Aug. 25, 1994, Ser. No. 296,085

Claims priority, application Germany, Jun. 17, 1992, 42 19 777.5

Int. Cl.^{6} D01H *5/32*

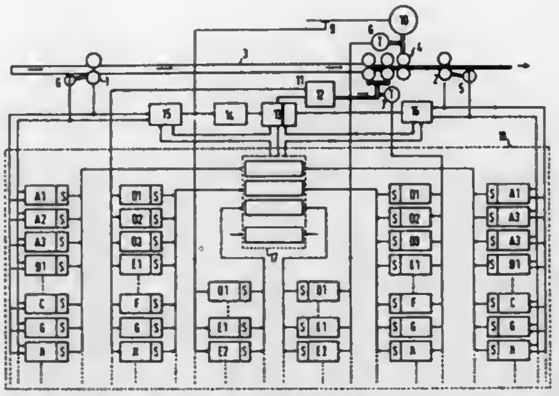
U.S. Cl. 364—470 **15 Claims**

1. A process for controlling an autolevelling draw frame as a function of parallel analysis of detected measured-value signals which are used by the draw frame to accomplish autolevelling, said process comprising the steps of:

conducting analyses of the measured-value signals over predetermined periods of time in parallel with and independent of the autolevelling processing of the measured value signals;

generating time dependent signal magnitudes from the analyses of the measured value signals, each time dependent signal magnitude derived from measurements of the respective measured value signals over the predetermined period of time;

saving the signal magnitudes in predetermined memory locations within a computer system;



updating the time related signal magnitudes, and comparing the updated signal magnitudes with the signal magnitudes stored in the corresponding memory locations;

replacing the stored signal magnitudes with the updated signal magnitudes in the corresponding memory location in the event that the updated signal magnitude is within a predetermined tolerance range of the stored signal magnitude; and

in the event that the deviation between any updated signal magnitude and stored signal magnitude is not within the tolerance range, interrogating all relevant stored signal magnitudes within said computer system in order to classify the type error causing the deviation.

5,463,557

ROVING MACHINE

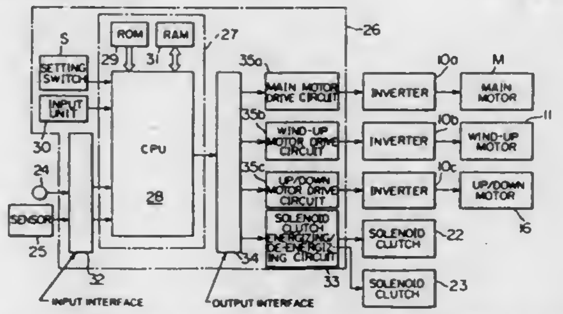
Tsutomu Nakano, and Katsumi Nakane, both of Kariya, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

Filed May 5, 1993, Ser. No. 59,079

Claims priority, application Japan, May 15, 1992, 4-123936; Sep. 17, 1992, 4-248322

Int. Cl.^{6} D01H *1/26*

U.S. Cl. 364—470 **11 Claims**



1. A roving machine including a wind-up speed changing apparatus for reducing the rotational speed of a bobbin in response to an increase in the roving weight of a textile fiber wound thereon, said roving machine comprising:

a contactless position sensor for detecting the position of a sliver portion of said textile fiber located between a front roller and a flyer in said roving machine;

input means through which a plurality of roving condition data for said textile fiber are entered, said data for said textile fiber including at least its sliver weight, its fiber kind, the speed of rotation of said flyer, and the number of laps of said textile fiber over a presser in said roving machine;

storage means for storing a first database for determining the amount of decrease in bobbin rotational speed that corresponds to said increase in said roving weight of said textile fiber wound around said bobbin with said roving weight of said textile fiber as a variable, said storage means further storing a second database or a calculation formula for determining an adjustment to said amount of decrease in bobbin rotational speed, said adjustment corresponding to the amount of positional shift of said sliver portion from a reference position for said sliver portion of said textile fiber in a proper tension state within the detectable range of said position sensor with said roving weight of said textile fiber as a variable; and

control means for reducing the rotational speed of said bobbin by determining the desired amount of the decrease in said bobbin rotational speed from data in said first database, determining an adjustment to said desired amount of said decrease in said bobbin rotational speed from data in said second database or calculation formula, adjusting said desired amount of decrease in said bobbin rotational speed by said determined adjustment, and outputting to said wind-up speed changing apparatus a control signal for reducing the rotational speed of said bobbin by the adjusted amount of said desired decrease.

5,463,558

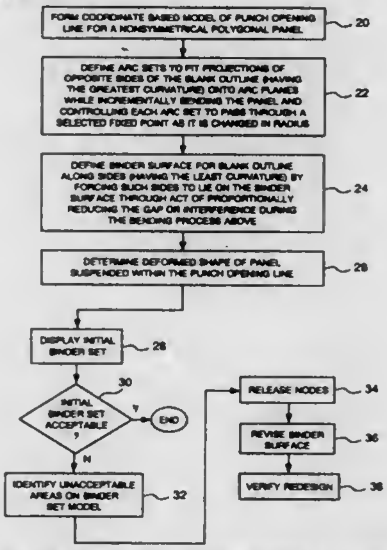
METHOD FOR DESIGNING A BINDER RING SURFACE FOR A SHEET METAL PART

Sing C. Tang, Plymouth; Maurice M. K. Lou, Canton, and Thomas J. Balun, Sterling Heights, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Feb. 4, 1994, Ser. No. 191,696

Int. Cl.^{6} G05B *19/18*

U.S. Cl. 364—472 **8 Claims**


FORM COORDINATE BASED MODEL OF PUNCH OPENING LINE FOR A NONSYMMETRICAL POLYGONAL PANEL
20
DEFINE ARC SETS TO FIT PROJECTIONS OF OPPOSITE SIDES OF THE BLANK OUTLINE (HAVING THE GREATEST CURVATURE) ONTO ARC PLANES WHILE INCREMENTALLY BENDING THE PANEL AND CONTROLLING EACH ARC SET TO PASS THROUGH A SELECTED FIXED POINT AS IT IS CHANGED IN RADIUS
22
DEFINE BINDER SURFACE FOR BLANK OUTLINE ALONG SIDES (HAVING THE LEAST CURVATURE) BY FORCING SUCH SIDES TO LIE ON THE BINDER SURFACE THROUGH ACT OF PROPORTIONALLY REDUCING THE GAP OR INTERFERENCE DURING THE BENDING PROCESS ABOVE
24
DETERMINE DEFORMED SHAPE OF PANEL SUSPENDED WITHIN THE PUNCH OPENING LINE
26
DISPLAY INITIAL BINDER SET
28
30
INITIAL BINDER SET ACCEPTABLE ?
Y
END
N
IDENTIFY UNACCEPTABLE AREAS ON BINDER SET MODEL
32
RELEASE NODES
34
REVISE BINDER SURFACE
36
VERIFY REDESIGN
38

1. A method for aiding sheet metal forming tool design, for use with a computer including memory, and forming tools including a draw die, punch and binder having surfaces designed to form the sheet metal into a part, and a die cavity, the sheet metal having a surface and being represented as a mesh including a plurality of nodes, the method comprising:

evaluating an initial binder-set associated with an initial binder surface design during a first stage of forming the sheet metal in which at least one of the plurality of sheet metal mesh nodes is forced against the binder surface;

detecting an area of unacceptable deformation on the sheet metal mesh in the die cavity;

identifying the at least one of the plurality nodes forced against the binder surface associated with the unacceptable sheet metal deformation;

releasing the at least one of the plurality of nodes identified, so as to allow the identified nodes to move as the sheet metal assumes a relaxed state; and

redesigning the initial binder surface based on the relaxed state to obtain a modified binder surface.

5,463,559

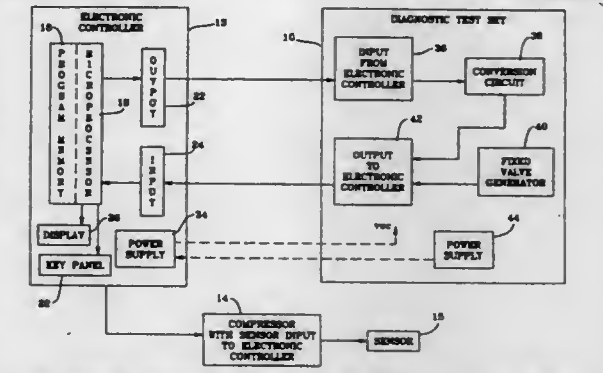
DIAGNOSTIC APPARATUS FOR AN ELECTRONIC CONTROLLER

Paul A. Kirkpatrick, Charlotte, and James D. Mehaffey, Mooresville, both of N.C., assignors to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Jul. 19, 1993, Ser. No. 93,418

Int. Cl.^{6} G05B *23/00;23/02*

U.S. Cl. 364—483 **12 Claims**



1. A portable diagnostic apparatus for an electronic controller of a machine, the electronic controller having a microprocessor and a program memory, the electronic controller having therein logic means for controlling the diagnostic apparatus and means for selectively connecting and disconnecting the machine being controlled from the electronic controller, the diagnostic apparatus comprising:

AC voltage detection means for sequentially detecting at least one high level AC voltage signal generated by at least one electronic controller output;

conversion means for converting the at least one high level AC voltage signal to at least one low level DC voltage signal which simulates a low level contact closure input;

means for generating at least one analog voltage signal which simulates at least one known, fixed value operating parameter of the machine;

means for sequentially outputting the at least one low level DC voltage signal and the at least one analog voltage signal to a low level DC voltage input of the electronic controller for processing by the microprocessor of the electronic controller thereby providing for automatic testing, diagnosing and exercising of the electronic controller in response to simulated operating parameters of the machine; and

means for selectively connecting and disconnecting the electronic controller from the diagnostic apparatus.

5,463,560

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE

Hiroyuki Goto, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Sep. 28, 1992, Ser. No. 952,690

Claims priority, application Japan, Sep. 27, 1991, 3-248695

Int. Cl.^{6} H03K *19/08*

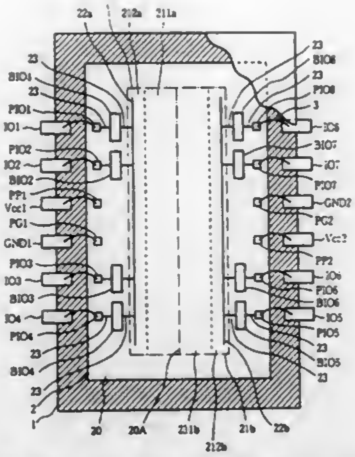
U.S. Cl. 364—489 **6 Claims**

1. A semiconductor integrated circuit device for receiving a plurality of signals and performing a data processing operation in response to said signals, said device comprising;

a semiconductor substrate of a rectangular shape defined by first and second edges opposite to each other and third and fourth edges opposite to each other;

an internal circuit formed on said semiconductor substrate and performing said data processing operation, said internal circuit having a first side facing said first edge of said semiconductor substrate and a second side facing said second edge of said semiconductor substrate;

a plurality of first pads provided for a first part of said signals to receive respective ones of said first part of said signals and



formed on said semiconductor substrate between said first edge of said semiconductor substrate and said first side of said internal circuit;

a plurality of second pads provided for a second part of said signals to receive respective ones of said second part of said signals and formed on said semiconductor substrate between said second edge of said semiconductor substrate and said second side of said internal circuit;

a set of first bus lines formed along and parallel with said first side of said internal circuit;

a set of second bus lines formed along and parallel with said second side of said internal circuit;

first means provided between said first edge of said semiconductor substrate and said first side of said internal circuit for coupling each of said first pads to an associated one of said first bus lines; and

second means provided between said second edge of said semiconductor substrate and said second side of said internal circuit for coupling each of said second pads to an associated one of said second bus lines; said internal circuit receiving said signals through said first and second pads and said first and second bus lines to perform said data processing operation in response to said signals.

5,463,561

HIGH CAPACITY NETLIST COMPARISON

Rahul Razdan, Princeton, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

Filed Jun. 30, 1993, Ser. No. 85,639

Int. Cl.^{6} G06F *17/50*

U.S. Cl. 364—489 **17 Claims**

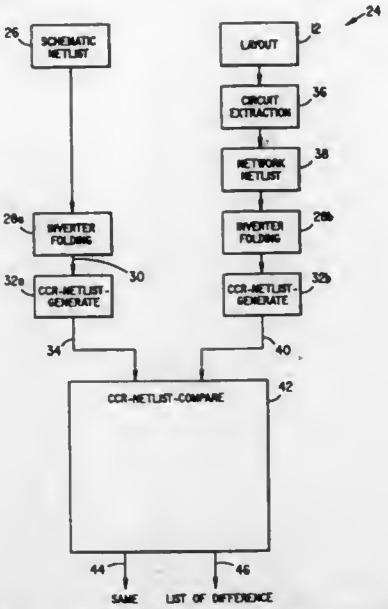
1. A method for determining whether multiple representations of a design of a circuit are consistent with each other, said circuit including a plurality of devices each of which has a channel for conducting electrical current and a plurality of nodes interconnecting said devices, each one of said representations including a list of device elements that describe said devices and a list of node elements that describe said nodes, said method including

modifying a of said lists in a first one of the multiple representations by:

analyzing said device elements and said node elements in said first one of the multiple representations to identify at least one channel connected region of said circuit, said channel connected region including a subset of said devices the channels of which are interconnected by a subset of said nodes,

defining, for each said channel connected region, a channel connected region element that describes said subset of said devices and said subset of said nodes in said region, and

replacing the device elements of each said subset of devices and the node elements of each said subset of nodes in said first list with said channel connected region element;



modifying said lists in a second one of the multiple representations by:

analyzing said device elements and said node elements in said second one of the multiple representations to identify at least one channel connected region of said circuit, said channel connected region including a subset of said devices the channels of which are interconnected by a subset of said nodes,

defining, for each said channel connected region, a channel connected region element that describes each said subset of said devices and each said subset of said nodes in said region, and

replacing the device elements of said subset of devices and the node elements of said subset of nodes in said second list with said channel connected region element; and

comparing the modified lists in said first one of the multiple representations with the modified lists in said second one of the multiple representations as a basis for determining whether said representations are consistent with each other.

5,463,562

DESIGN AUTOMATION METHOD FOR DIGITAL ELECTRONIC CIRCUITS

Leonard Theobald, Manchester, Great Britain, assignor to International Computers Limited, London, Great Britain

Filed Dec. 20, 1994, Ser. No. 359,519

Claims priority, application United Kingdom, Mar. 3, 1994, 9404078

Int. Cl.^{6} H01L *25/00;* **G01R** *15/12;* **H04B** *17/00;* **G05B** *23/02*

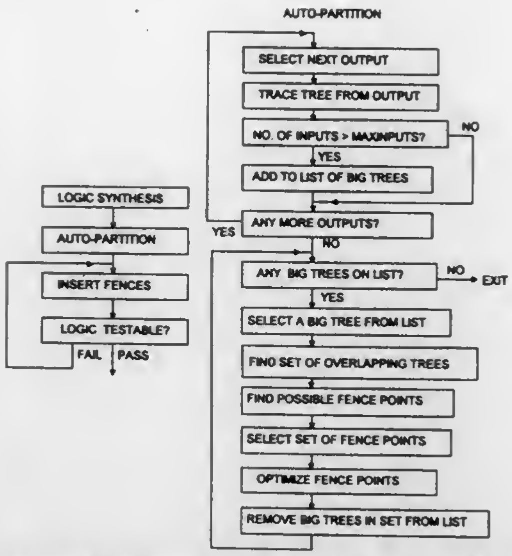
U.S. Cl. 364—489 **7 Claims**

1. A method of automatically partitioning a logic tree to improve testability thereof, comprising the steps:

(a) identifying a set of driving bits for each of a set of points within the tree;

(b) for each of said set of points, identifying a set of splittable input bits that can be isolated by insertion of a self-test register at that point; identifying which of said points are possible fence points,

(c) having more than one splittable input bit; and



(d) selecting a sub-set of said possible fence points, sufficient to reduce the number of inputs to the logic tree to a value less than a predetermined limit, and inserting self-test registers at said sub-set of possible fence points.

5,463,563

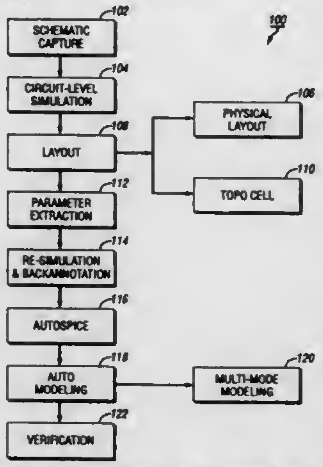
AUTOMATIC LOGIC MODEL GENERATION FROM SCHEMATIC DATA BASE

Owen S. Bair; Patrick Yin, and Chih-Chung Chen, all of San Jose, Calif., assignors to LSI Logic Corporation, Milpitas, Calif.

Continuation of Ser. No. 684,668, Apr. 12, 1991, Pat. No. 5,278,769. This application Jun. 30, 1993, Ser. No. 85,658

Int. Cl.^{6} G06F *17/50*

U.S. Cl. 364—490 **4 Claims**



1. Method of generating logic and timing models in an integrated circuit design station having a computer, a graphic display device displaying signals generated by the computer, a graphic input device for making inputs to the computer, comprising performing the following steps in the integrated design station:

operating on the inputs and storing in the computer a net-list interconnection representation of a graphical representation of a circuit;

providing stimulus data corresponding to patterns of input stimuli for the circuit;

simulating performance of a logic-level model of the circuit according to the stimulus data and providing logic simulation results, and representing the logic-level model of the circuit as interconnected logic blocks;

simulating, at the circuit-level, performance of a transistor-level model of the circuit according to the stimulus data and providing simulated performance results;

providing layout information to the transistor-level model of the circuit;

providing timing and delay information obtained from the simulation performance of transistor-level simulation to the logic blocks used in the simulation of the logic-level model;

comparing the logic simulation results with the simulated performance results according to pre-determined criteria for success; and

providing an indication of a result of said comparison for automatic verification of the functional and timing accuracy of the generated logic-level model.

5,463,564

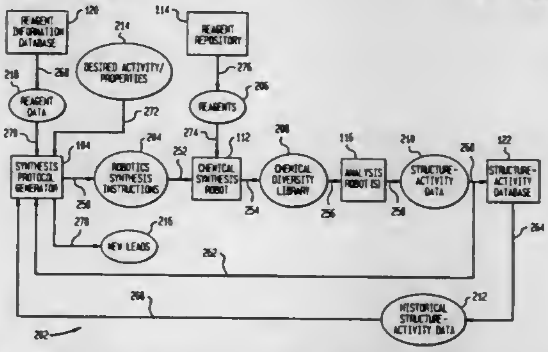
SYSTEM AND METHOD OF AUTOMATICALLY GENERATING CHEMICAL COMPOUNDS WITH DESIRED PROPERTIES

Dimitris K. Agrafiotis, Exton, Pa.; Roger F. Bone, Bridgewater, N.J.; Francis R. Salemme, Kennett Square, Pa., and Richard M. Soll, Lawrenceville, N.J., assignors to 3-Dimensional Pharmaceuticals, Inc., Philadelphia, Pa.

Filed Sep. 16, 1994, Ser. No. 306,915

Int. Cl.^{6} G06F *17/50*

U.S. Cl. 364—496 **64 Claims**


120
REAGENT INFORMATION DATABASE
214
DESIRED ACTIVITY/ PROPERTIES
114
REAGENT REPOSITORY
276
206
REAGENTS
218
268
REAGENT DATA
272
270
274
112
208
116
210
260
122
104
SYNTHESIS PROTOCOL GENERATOR
204
ROBOTICS SYNTHESIS INSTRUCTIONS
252
CHEMICAL SYNTHESIS ROBOT
CHEMICAL DIVERSITY LIBRARY
ANALYSIS ROBOT (S)
STRUCTURE-ACTIVITY DATA
STRUCTURE-ACTIVITY DATABASE
250
254
256
258
278
216
NEW LEADS
262
264
266
212
HISTORICAL STRUCTURE-ACTIVITY DATA
202

40. A computer based method of iteratively generating a plurality of directed diversity chemical libraries each comprising multiple chemical compounds, wherein chemical compounds in said directed diversity chemical libraries more closely conform to a prescribed set of activity/properties during each successive iteration, the method comprising the steps of:

(1) robotically synthesizing, in accordance with robotic synthesis instructions, a directed diversity chemical library comprising a plurality of chemical compounds;

(2) robotically analyzing said chemical compounds to obtain structure-activity data pertaining thereto;

(3) analyzing, under computer control, said structure-activity data of said compounds and historical structure-activity data pertaining to compounds synthesized and analyzed during prior iterations to derive structure-activity models having enhanced predictive and discriminating capabilities;

(4) identifying, under computer control and in accordance with said structure-activity models, reagents from a reagent database that, when combined, will produce a set of compounds predicted to exhibit activity/properties more closely matching said prescribed set of activity/properties;

(5) generating, under computer control, robotic synthesis instructions that, when executed, enable robotic synthesis of said set of compounds; and

(6) repeating steps (1)–(5), wherein step (1) is repeated using said generated robotic synthesis instructions.

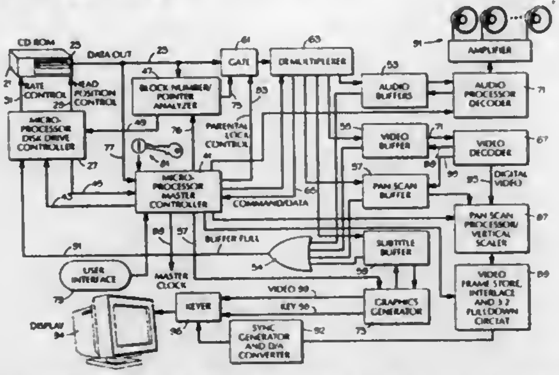
5,463,565
DATA BLOCK FORMAT FOR SOFTWARE CARRIER AND PLAYER THEREFOR

Christopher J. Cookson, and Lewis S. Ostrover, both of Los Angeles, Calif., assignors to Time Warner Entertainment Co., L.P., Burbank, Calif.

Filed Oct. 29, 1993, Ser. No. 146,440

Int. Cl.^{6} G11B *7/007*

U.S. Cl. 364—514 R **21 Claims**



1. An optical disk for use in a compatible player for representing a plurality of signals which are to be played synchronized with each other, said signals being represented on the disk in the form of digital data, with each of said signals being represented by a bit stream designed to be processed during play of the optical disk at a rate which varies with the information content of the signal itself and with the bit rates for said plurality of signals being independent of each other, the digital data on the optical disk being organized in a series of data blocks with the data blocks containing variable numbers of bits of each bit stream, the bit streams being distributed among the data blocks such that bits of each bit stream, after being read from the disk and buffered by a compatible player, are at all times available as required for proper reconstruction of the respective represented signal.

5,463,566
PREPROCESSOR FOR DETECTION OF PUNCTIFORM SOURCES IN INFRARED SCENARIOS

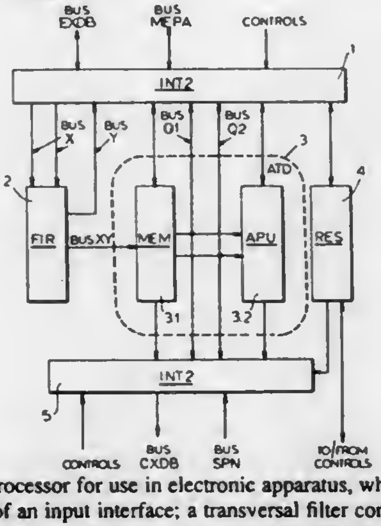
Paolo Marrucci, Morena; Germano Sgarzi, Rome, and Fabio Vitale, Ostia, all of, Italy, assignors to Alenia Aeritalia & Selenia S.p.A., Rome, Italy

Continuation of Ser. No. 934,175, Aug. 21, 1992, abandoned. This application Dec. 13, 1994, Ser. No. 357,045

Claims priority, application Italy, Aug. 21, 1991, RM91A0625

Int. Cl.^{6} G01S *17/02*

U.S. Cl. 364—516 **3 Claims**



1. A preprocessor for use in electronic apparatus, which consists essentially of an input interface; a transversal filter connected by a bus to the input interface; a device with adaptable threshold connected by at least one bus with the filter and by at least one bus with the input interface; an assembly of resources connected by a bus with the input interface, and an output interface connected by respective buses with said device and said assembly of resources, said device with adaptable threshold comprising an internal memory, and an arithmetic processing unit, said assembly of resources comprising a complex of counters and comparators and being connected to an external controller, said output interface being provided with means for acquiring angular reference data, the entire preprocessor being a chip capable of presenting a calculated integration in less than sixty thousand cells, said transversal filter comprising means a register and a plurality of multipliers and adders connected to said register for calculating a function of the type $y(n,N)=[c1*x(n,N)+x(n-a,N)]+[x(n-a-2,N)+c2*x(n-b,N)]$ for $N=16$ channels and where $x(n,N)$ represents input data in the filter at the moment of calculation for N.

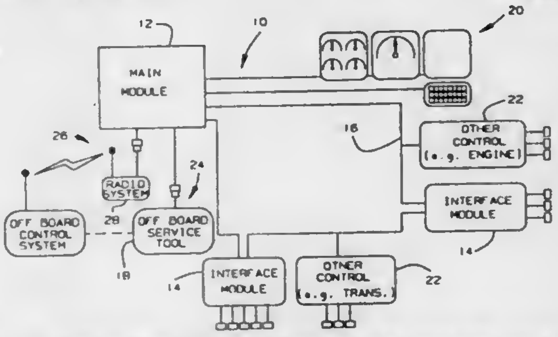
5,463,567
APPARATUS AND METHOD FOR PROVIDING HISTORICAL DATA REGARDING MACHINE OPERATING PARAMETERS

Charles G. Boen; John M. Hadank, both of Dunlap; Kenneth J. McGuire; David R. Schricker, both of Peoria, and Rolland D. Scholl, Dunlap, all of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Oct. 15, 1993, Ser. No. 137,853

Int. Cl.^{6} G01M *17/00;19/00;* **G06F** *11/00*

U.S. Cl. 364—551.01 **16 Claims**



1. An apparatus for providing historical data regarding machine operating parameters, comprising:

a plurality of sensor means for producing signals indicative of the level of machine parameters, said machine parameters including a first operating parameter and two or more dependency parameters, at least one of said dependency parameters being different from said first operating parameter;

means for selecting a processing method according to which operating parameter data is to be processed;

control means for receiving said signals and selecting data representative of said first operating parameter in response to a dependency definition being satisfied and discarding data representative of said first operating parameter in response to said dependency definition being unsatisfied, said dependency definition including a plurality of predefined ranges, each of said dependency parameters corresponding to one of said predefined ranges, said dependency definition being satisfied in response to said two or more dependency parameters each being within the corresponding predefined range;

memory means for storing the level or levels associated with the predefined range for each of said dependency parameters, each of said predefined ranges being accessible by said control means; and

compiling means for receiving the selected data from said control means, processing said selected data according to the selected processing method, and storing the processed data in said memory means.

5,463,568

METHOD AND APPARATUS FOR MEASURING A DISTANCE OF A ROUTE IN A SOLID FIGURE

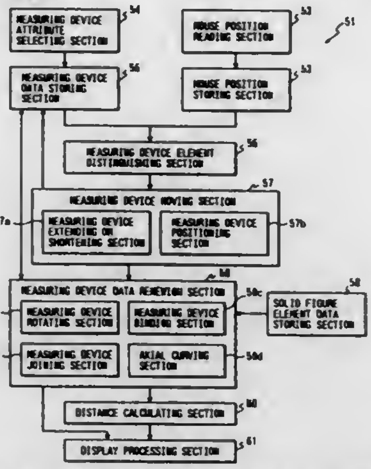
Takamasa Oyama, Kawasaki; Masao Kato, Yokohama, and Michio Miwa, Tokyo, all of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Nov. 23, 1993, Ser. No. 155,885

Claims priority, application Japan, Nov. 26, 1992, 4-337784

Int. Cl.^{6} G01B *7/28*

U.S. Cl. 364—561 **21 Claims**



MEASURING DEVICE ATTRIBUTE SELECTING SECTION
54
MOUSE POSITION READING SECTION
52
51
MEASURING DEVICE DATA STORING SECTION
55
MOUSE POSITION STORING SECTION
53
MEASURING DEVICE ELEMENT DISTINGUISHING SECTION
56
MEASURING DEVICE MOVING SECTION
57
57a
MEASURING DEVICE EXTENDING OR SHORTENING SECTION
MEASURING DEVICE POSITIONING SECTION
57b
MEASURING DEVICE DATA RENEWING SECTION
59
59c
SOLID FIGURE ELEMENT DATA STORING SECTION
58
59a
MEASURING DEVICE ROTATING SECTION
MEASURING DEVICE BINDING SECTION
59b
MEASURING DEVICE JOINING SECTION
AXIAL CURVING SECTION
59d
DISTANCE CALCULATING SECTION
60
DISPLAY PROCESSING SECTION
61

1. A solid figure distance measuring apparatus comprising:

measuring device data storing means for storing pieces of three-dimensional structural data of a measuring device which includes a piece of three-dimensional length data denoting a three-dimensional length of the measuring device and a piece of three-dimensional positional data denoting a three-dimensional position of the measuring device, the three-dimensional length of the measuring device being represented by a three-dimensional element distance between a first constitutional element of the measuring device and a second constitutional element of the measuring device;

solid figure data storing means for storing pieces of three-dimensional figure element data denoting three-dimensional shapes of a plurality of figure elements of a solid figure;

displaying means for displaying the solid figure in a display screen according to pieces of three-dimensional figure element data stored in the solid figure data storing means and displaying the measuring device in the display screen according to pieces of three-dimensional structural data of the measuring device stored in the measuring device data storing means;

measuring device positioning means for positioning the first constitutional element of the measuring device displayed by the displaying means at a first point on the display screen while changing the piece of three-dimensional positional data stored in the measuring device data storing means;

measuring device extending or shortening means for extending or shortening the three-dimensional length of the measuring device, of which the first constitutional element is positioned at the first point by the measuring device positioning means, to set the second constitutional element of the measuring device displayed by the displaying means at a second point on the display screen while changing the piece of three-dimensional length data stored in the measuring device data storing means; and

figure distance calculating means for calculating the three-dimensional length of the measuring device which is extended or shortened in the measuring device extending or shortening means, the three-dimensional length of the measuring device calculated by the figure distance calculating means being displayed in the display screen by the displaying means as a figure distance between a first figure element of the solid figure placed at the first point and a second figure element of the solid figure placed at the second point.

5,463,569

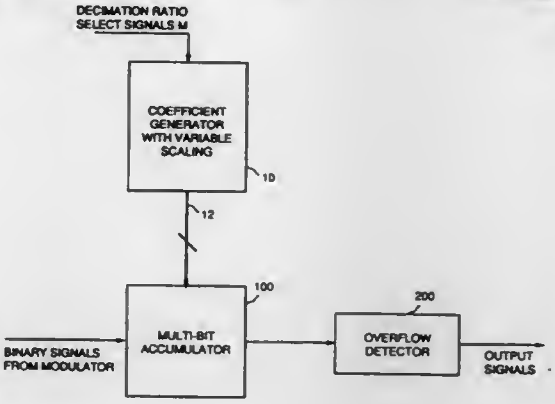
DECIMATION FILTER USING A ZERO-FILL CIRCUIT FOR PROVIDING A SELECTABLE DECIMATION RATIO

Daniel A. Staver, and Donald T. McGrath, both of Scotia, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jun. 24, 1994, Ser. No. 265,343

Int. Cl.^{6} G06F *15/31*

U.S. Cl. 364—724.1 **19 Claims**



DECIMATION RATIO SELECT SIGNALS M
COEFFICIENT GENERATOR WITH VARIABLE SCALING
10
12
100
200
BINARY SIGNALS FROM MODULATOR
MULTI-BIT ACCUMULATOR
OVERFLOW DETECTOR
OUTPUT SIGNALS

1. A decimation filter having a selectable decimation ratio for filtering at least one externally derived stream of quantized electrical signals having a predetermined rate, said filter comprising:

a coefficient generator responsive to a set of externally derived decimation-ratio select signals to provide a separate predeterminedly normalized coefficient signal at each respective one of a plurality of output ports;

said coefficient generator comprising:

a demultiplexer unit responsive to the set of externally derived decimation-ratio select signals to provide at a selected one of S demultiplexer output ports a predetermined scaling-control output signal, wherein S is a predetermined integer corresponding to a number of selectable decimation ratios provided by said decimation filter;

an (N+S−1)-bit counter responsive to a predetermined counter clock signal and coupled to receive the scaling-control signal from said demultiplexer unit to provide a separate counter output signal at selected ones of N+S−1 counter output ports, wherein N is a predetermined integer chosen so that 2^N and $2^{N-(S-1)}$, respectively, constitute upper and lower decimation ratio bounds of said decimation filter;

an inverter circuit coupled to said counter circuit to receive each counter output signal, said inverter responsive to an inverter control signal to selectively invert or not each received counter output signal; and

a zero-fill circuit coupled to receive each output signal from said inverter circuit and responsive to the scaling-control output signal from the demultiplexer unit to provide the separate normalized coefficient signals at each respective one of N+S−1 zero-fill circuit output ports which comprise the plurality of output ports of said coefficient generator;

an accumulator coupled to said coefficient generator to receive each normalized coefficient signal generated therein, said accumulator further coupled to receive said at least one stream of quantized electrical signals so as to produce, upon masking with respective ones of the received normalized coefficient signals, a plurality of accumulator output signals; and

an overflow detector coupled to said accumulator to detect an overflow condition in said accumulator.

5,463,570
DIGITAL DATA ROUNDING

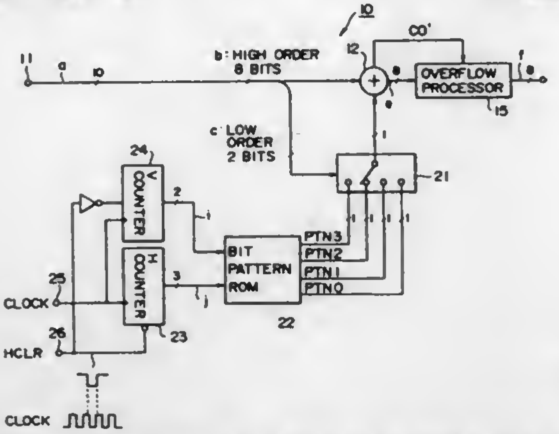
Tetsuro Nakata, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Aug. 12, 1993, Ser. No. 105,178

Claims priority, application Japan, Aug. 21, 1992, 4-223050

Int. Cl.^{6} G06F *7/38*

U.S. Cl. 364—745 **13 Claims**



1. Apparatus for converting n-bit digital data to k-bit digital data, where k<n, said apparatus comprising:

pattern signal generating means for generating at least $2^{(n-k)}$ fixed pattern signals independently of said n-bit digital data;

selecting means for selecting a particular fixed pattern signal from said $2^{(n-k)}$ fixed pattern signals according to a value of (n−k) least significant bits to be dropped; and

adding means for adding said particular fixed pattern signal selected by said selecting means to an upper k significant bits of said n-bit digital data,

whereby rounded k bits of digital data are output from said adding means.

5,463,571
MULTI-NARY OR LOGIC DEVICE

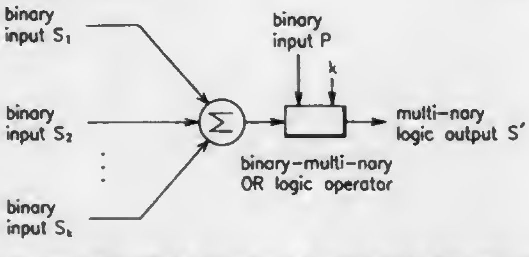
Jin-Up Kim, and Sun-Young Kim, both of Daejeon, Rep. of Korea, assignors to Electronics and Telecommunications Research Institute, Rep. of Korea

Filed Dec. 13, 1994, Ser. No. 357,245

Claims priority, application Rep. of Korea, Nov. 15, 1994, 94-29918

Int. Cl.^{6} G06F *7/00*

U.S. Cl. 364—746.2 **1 Claim**


binary input S₁
binary input P
k
binary input S₂
Σ
multi-nary logic output S'
binary-multi-nary OR logic operator
binary input Sₖ

1. A multi-nary OR logic device for carrying out the multi-nary OR logic operation of k (herein, k is an. integer) binary inputs having the designated bit, respectively, and one binary input, said k binary inputs and one binary input having the designated bits, respectively, comprising:

an arithmetic summer for sequentially summing the k binary inputs inputted in bit units, thereby calculating the multi-nary value corresponding to said k binary inputs; and

a binary multi-nary OR logic operator for receiving the output of the arithmetic summer and the binary input.

5,463,572
MULTI-NARY AND LOGIC DEVICE

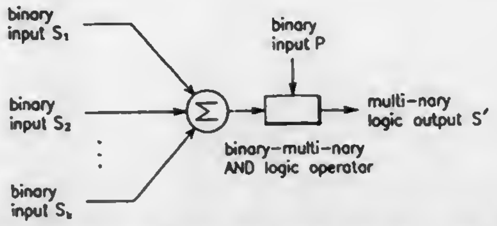
Jin-Up Kim, and Sun-Young Kim, both of Daejeon, Rep. of Korea, assignors to Electronics and Telecommunications Research Institute, Rep. of Korea

Filed Dec. 13, 1994, Ser. No. 357,246

Claims priority, application Rep. of Korea, Nov. 15, 1994, 94-29917

Int. Cl.^{6} G06F *7/00*

U.S. Cl. 364—746.2 **1 Claim**


binary input S₁
binary input P
binary input S₂
Σ
multi-nary logic output S'
binary-multi-nary AND logic operator
binary input Sₖ

1. A multi-nary AND logic device for carrying out the multi-nary AND logic operation of k (herein, k is an integer) binary inputs and one binary input, said k binary inputs and one binary input having the designated bits, respectively, comprising:

an arithmetic summer for sequentially summing the k binary inputs inputted in bit units, thereby calculating a multi-nary logic value corresponding to the binary inputs; and

a binary-multi-nary AND logic operator for receiving the output of the arithmetic summer and the binary input.

5,463,573
MULTIVALUED SUBTRACTER HAVING CAPABILITY OF SHARING PLURAL MULTIVALUED SIGNALS

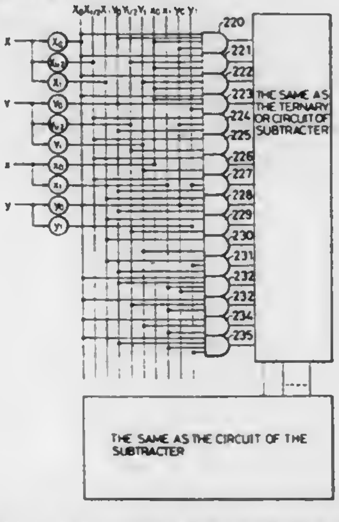
Yukihiro Yoshida, Ikoma, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Nov. 16, 1993, Ser. No. 152,860

Claims priority, application Japan, Nov. 18, 1992, 4-308455

Int. Cl.^{6} G06F *7/00;7/50*

U.S. Cl. 364—746.2 **12 Claims**


X
Y
x
y
220
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232
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235
THE SAME AS THE TERNARY OR CIRCUIT OF SUBTRACTER
THE SAME AS THE CIRCUIT OF THE SUBTRACTER

1. An apparatus for processing a subtraction between a first data and a second data, each of said first and second data being in one of binary logic and multivalued logic, comprising:

first input means having parallel inputs of binary logic and multivalued logic for receiving said first data, and for outputting a first set of bit data representing said first data;

second input means having parallel inputs of binary logic and multivalued logic for receiving said second data, and for outputting a second set of bit data representing said second data;

subtracting means connected to said first input means and said second input means for subtracting said second set of bit data from said first set of bit data; and

output means, connected to said subtracting means, for converting output of said subtracting means into data in binary logic and multivalued logic, in parallel, and for outputting converted data in binary logic and multivalued logic, in parallel.

5,463,574

APPARATUS FOR ARGUMENT REDUCTION IN EXPONENTIAL COMPUTATIONS OF IEEE STANDARD FLOATING-POINT NUMBERS

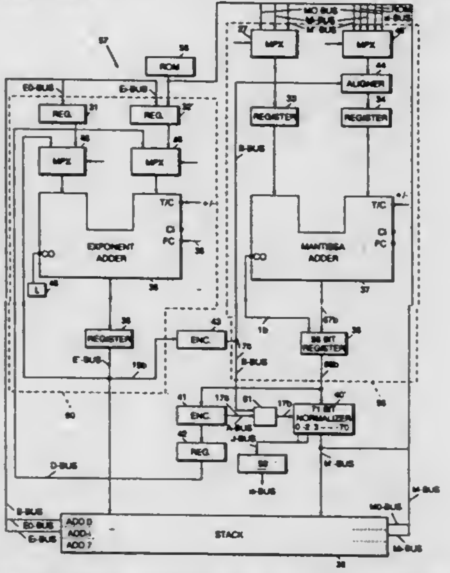
Bernard Desrosiers, Boissise Le Roi; Didier Louis, Fontainebleau; Didier Pinchon, Lew Ulis, and Andre Steimle, Evry, all of, France, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 29, 1993, Ser. No. 99,119

Claims priority, application European Pat. Off., Nov. 5, 1992, 92480165

Int. Cl.^{6} G06F *7/38*

U.S. Cl. 364—748 **3 Claims**



1. Apparatus (**57**) for executing an argument reduction stage in computing the value of an exponential function F(x)=(2**x)–1, by determining a value of xi and computing (x-xi) according to an IEEE 754 standard representation of floating-point format of a real number having a sign S, an exponent E and a mantissa M, wherein said real number is expressed as ((–1)**s))*(1.M)*(2**(E+BIAS)) with BIAS being a constant added to said exponent E, said apparatus comprising:

a) a first means (**59**) connected to a xi bus for performing pipeline ADD/SUBTRACT/COMPARE operations on an N bit mantissa by receiving input from a constant ROM and said xi bus, said first means including aligner means (**44**), a pair of input registers (**33**,**34**) one of which is connected to the output of said aligner mean, and mantissa adder (**37**) which receives an input from each of said pair of input registers and which provides an output to and an N+1 bit output register (**39**) wherein the most significant bit of said output register is a carry-out bit generated by the mantissa adder (**37**); the output register (**39**) is connected to both:

b) an N+4 bit normalizer means (**40'**) for receiving an output from said output register, said normalizer means having its three leftmost input bits tied to "zero" and having it three leftmost output bits J(**0**:**2**) output on a three-bit bus (J-BUS); and

c) a leading zero detector/encoder means (**41**) for determining the number Of leading zeros in said output register;

said apparatus further comprising:

d) a second means (**60**) for performing pipeline operations on exponents and having an output connected to an encoder means (**43**) whose output controls said aligner means;

e) a selector circuit (**61**) driven by the outputs of said detector/encoder means (**41**) and encoder means (**43**) whose output controls said normalizer means (**40'**); and,

f) a xi determining circuit (**62**), connected to the output of normalizer means (**40'**) by said three-bit bus, that calculates bits K(**1**) and K(**2**) from bits J(**0**:**2**) such that:

K(1)=J(0) or J(1)

K(2)=J(0) or J(2)

and generates the xi mantissa on the xi-BUS connected to said first means such that:

mantissa xi=0 K(1) K(2) 10 . . . . . 0.

5,463,575

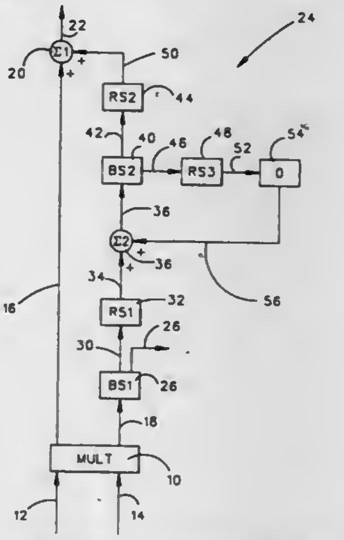
REDUCED QUANTIZATION NOISE FROM SINGLE-PRECISION MULTIPLIER

Stanley A. White, San Clemente, Calif., assignor to Rockwell International Corporation, Seal Beach, Calif.

Filed Jun. 24, 1994, Ser. No. 265,170

Int. Cl.^{6} G06F *7/38;7/52*

U.S. Cl. 364—754 **5 Claims**



1. An enhanced single-precision arithmetic multiplier for multiplying together two numbers, each number having n bits, namely, one sign bit, one integer bit, and n–2 fractional bits, wherein the enhanced multiplier has an output and comprises:

(a) a double precision multiplier constructed to multiply together the two numbers and to produce a product which has 2n-2 bits, the product comprising:
  (1) a most significant bit (MSBS) group of n bits, namely, one sign bit, one integer bit, and n–2 fractional bits; and
  (2) an unsigned least significant bit (LSB) group of n–2 bits, namely, n–2 fractional bits;

(b) a first adder having:
  (1) a first input connected to receive the n-bit MSBS group from the double precision multiplier;
  (2) a second input connected to receive the n-bit output of the below-recited second right shifter; and
  (3) an n-bit output, the output being the output of the enhanced multiplier;

(c) a first bit splitter constructed to:
  (1) receive as its input the n–2 bit LSB group from the double precision multiplier; and
  (2) produce an output comprising the n–3 MSBs of its input, the LSB of the n–2 bit input being discarded;

(d) a first right shifter constructed to:

  - (1) receive as its input the n–3 output of the first bit splitter; and
  - (2) produce an n-bit output comprising three zeroes followed by the n–3 bits of its input;
- (e) a second adder having:
  - (1) a first input connected to receive the n-bit output of the first right shifter;
  - (2) a second input connected to receive the n-bit output of the below-recited delay element; and
  - (3) an n-bit output;
- (f) a second bit splitter constructed to:
  - (1) receive as its input the n-bit output of the second adder;
  - (2) produce a first output comprising the 3 MSBs of its input; and
  - (3) produce a second output comprising the n–3 LSBs of its input;
- (g) a second right shifter constructed to:
  - (1) receive as its input the 3 bit first output (sign bit, integer bit, and most significant fractional bit) of the second bit splitter;
  - (2) produce an n-bit output comprising:
    - (A) as its n–2 MSBs, n–2 repetitions of the sign bit; followed by
    - (B) the integer input bit; followed by
    - (C) the most significant fractional input bit; and
  - (3) apply its n-bit output to the second input of the first adder;
- (h) a third right shifter constructed to:
  - (1) receive as its input the n–3 bit second output of the second bit splitter; and
  - (2) produce an n-bit output comprising three zeroes followed by the n–3 bits of its input; and
- (i) a delay unit connected to receive, as its input, the n-bit output of the third right shifter, and to produce, as its output, the n-bit second input of the second adder.

5,463,576

SEMICONDUCTOR MEMORY DEVICE INCLUDING MEMORY CELLS CONNECTED TO A GROUND LINE

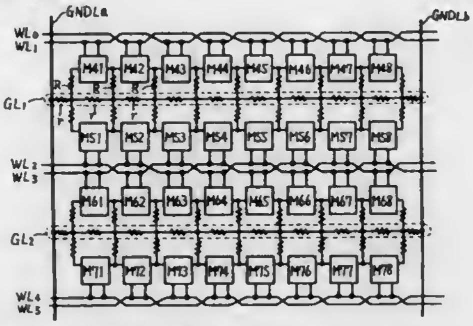
Hirotada Kuriyama, and Yoshio Kohno, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 126,765, Sep. 27, 1993, Pat. No. 5,379,247. This application Dec. 2, 1994, Ser. No. 353,387

Claims priority, application Japan, Sep. 28, 1992, 4-257840

Int. Cl.⁶ G11C *5/06*

U.S. Cl. 365—63 **4 Claims**



1. A semiconductor memory device, comprising:

a semiconductor substrate;

a memory cell array having a plurality of memory cells disposed in rows and columns on said substrate,

each said memory cell being bounded by first and second ground lines in the column direction;

a third ground line formed on said substrate in the row direction and connected to said memory cells; and

first and second word lines formed on said substrate in the row direction and connected to said memory cells, successive memory cells connected to said third ground line being connected to said first and second word lines alternately.

5,463,577

SEMICONDUCTOR MEMORY

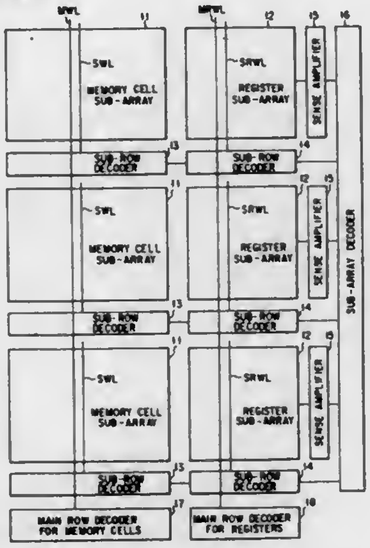
Yukihito Oowaki, and Takehiro Hasegawa, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 28, 1994, Ser. No. 365,104

Claims priority, application Japan, Dec. 28, 1993, 5-336667; Nov. 18, 1994, 6-285279

Int. Cl.⁶ G11C *11/24*

U.S. Cl. 365—63 **27 Claims**



15. A semiconductor memory comprising:

a semiconductor substrate;

a memory cell array having a plurality of memory cell sub-arrays, each of said sub-arrays constituted by a plurality of memory cell units arranged on said semiconductor substrate,

each of said memory cell units being constituted by cascade-connecting a predetermined number of memory cells with each other, each of said memory cells being selected by a row address and a column address;

a plurality of bit lines to which said plurality of memory cell units are coupled;

a plurality of sub word lines to which said plurality of memory cells are coupled;

a plurality of main word lines each of which selects a group of said sub word lines related to a memory cell unit in said memory cell arrays;

a main row decoder for receiving the row address and selectively activating a corresponding one of said main word lines;

a plurality of sub-row decoders respectively connected to a plurality of memory cell sub-arrays,

each of said sub-row decoders for activating said sub word lines related to said memory cell unit of corresponding memory cell sub-array; and

a sub-array decoder for activating corresponding one of said sub-row decoders;

wherein in accessing an arbitrary memory cell unit in said sub-arrays, all said sub-arrays determined by said row address being activated when a first memory cell is to be accessed, and one or ones among all said sub-array being selectively activated when second and sequential memory cells are accessed.

5,463,578

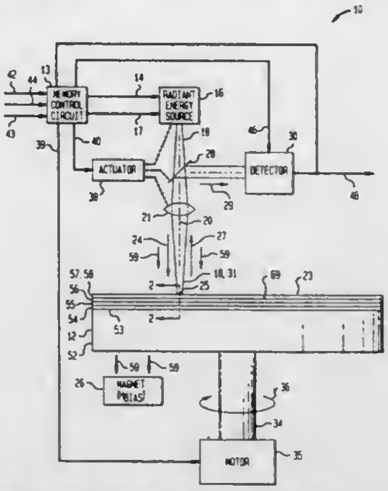
MAGNETO-OPTIC MEMORY ALLOWING DIRECT OVERWRITE OF DATA

Richard J. Gambino, Stony Brook, and Ralph R. Ruf, New City, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 22, 1994, Ser. No. 310,465

Int. Cl.^{6} G11C *13/06;* G11B *13/04*

U.S. Cl. 365—122 **12 Claims**



1. A magneto-optic storage media comprising:

a bias layer of first magnetic material having high coercivity and a square magnetization loop characteristic to provide an exchange bias field to act at first times on a storage layer,

a switching layer of second magnetic material having an antiferromagnetic state below a critical temperature T_{AF} and a ferromagnetic state above T_{AF} to provide exchange coupling between said bias layer and said storage layer, said second magnetic material having a thermal hysteresis between said antiferromagnetic state and said ferromagnetic state, and

a storage layer of third magnetic material having a square loop magneto-optic characteristic and a Curie temperature less than T_{AF}.

5,463,579

SEMICONDUCTOR MEMORY DEVICE WITH FLOATING GATE AND METHOD FOR DRIVING THE SAME

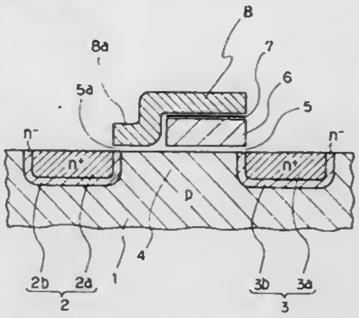
Noriyuki Shimoji, Kyoto, Japan, assignor to Rohm Co., Ltd., Kyoto, Japan

Continuation of Ser. No. 161,426, Dec. 6, 1993, abandoned. This application Mar. 9, 1995, Ser. No. 401,306

Claims priority, application Japan, Dec. 25, 1992, 4-347108

Int. Cl.^{6} G11C *11/34*

U.S. Cl. 365—185.01 **3 Claims**



1. A semiconductor memory device including a semiconductor substrate, and memory cells arranged in a matrix array on the semiconductor substrate, each of the memory cells comprising:

a drain region formed in the semiconductor substrate, the drain region comprising a high impurity concentration potion surrounded by a low impurity concentration portion,

a source region formed in the semiconductor substrate, the source region comprising a high impurity concentration portion surrounded by a low impurity concentration portion,

a channel region defined between the drain region and the source region,

a tunnel insulating film formed on the channel region of the substrate,

a floating gate formed only in the channel region and the low impurity concentration portion of the drain region on the tunnel insulating film, said floating gate having an end face aligned with an interface between said low impurity concentration portion and said high impurity concentration portion of said drain region,

an interlayer insulating film formed on the floating gate, and

a control gate formed on the interlayer insulating film,

wherein the drain region of each memory cell is connected to or is in common with the source region of the adjacent memory cell;

the floating gate covers only a portion of the channel region; and

the control gate is formed in a step shape such that a portion of the control gate covers either side of the channel region close to the drain or the source region with intervention of a gate insulating film while the remaining portion of the control gate covers the top and a lateral surface of the floating gate with intervention of the interlayer insulating film.

5,463,580

STATIC SEMICONDUCTOR MEMORY DEVICE HAVING IMPROVED READ OPERATION MARGIN AND SPEED

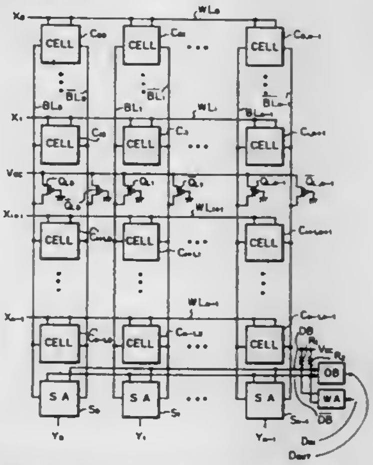
Kazuyuki Nakamura, Tokyo, Japan, assignor to NEC Corproation, Tokyo, Japan

Filed Jul. 7, 1994, Ser. No. 271,663

Claims priority, application Japan, Jul. 7, 1993, 5-167577; Sep. 2, 1993, 5-218293

Int. Cl.^{6} G11C *13/00*

U.S. Cl. 365—189.01 **10 Claims**



3. A semiconductor memory device, comprising:

a plurality of word lines;

a plurality of pairs of bit lines;

a plurality of static memory cells, each of said state memory cells being connected to a respective one of said word lines and one pair of said pairs of bit lines;

sense amplifier means, connected to said bit lines, for sensing a difference in potential between one of said pairs of bit lines;

a first plurality of first resistive loads connected to a power supply, each of said first resistive loads being connected at a substantially central location of one of said bit lines;

a second plurality of second resistive loads which are connected to a plurality of locations of each of said bit lines;

word line selecting means, connected to said word lines, for selecting one of said word lines;

bit line pair selecting means, connected to said pairs of bit lines, for selecting one of said pairs of bit lines; and

resistive load selecting means, connected to said first and second resistive loads, for selecting and turning ON one of said first and second resistive loads per one bit line.

5,463,581

MEMORY IN WHICH IMPROVEMENT IS MADE AS REGARDS A PRECHARGE OPERATION OF DATA READOUT ROUTES

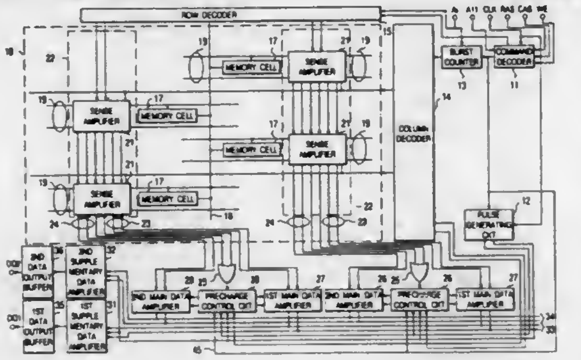
Yasuji Koshikawa, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Aug. 26, 1994, Ser. No. 295,076

Claims priority, application Japan, Aug. 29, 1993, 5-211320

Int. Cl.^{6} G11C *7/00*

U.S. Cl. 365—189.01 **6 Claims**



1. A semiconductor memory device comprising:

period determining means for determining a burst period;

a plurality of memory cells;

a plurality of word lines connected to said memory cells;

a plurality of bit line pairs connected to said memory cells, each of said bit line pairs comprising two bit lines having a bit line potential difference therebetween;

first processing means connected to said bit line pairs for processing said bit line potential difference into a first difference signal;

a plurality of read bus pairs connected to said first processing means and supplied with said first difference signal, each of said read bus pairs comprising two read buses having a read bus potential difference therebetween in dependence on said first difference signal;

second processing means connected to said read bus pairs for processing said read bus potential difference into a second difference signal to electrically charge said read bus pairs in accordance with the second difference signal; and

control means connected to said period determining means and said second processing means for controlling operation of said second processing means so that selected ones of said read bus pairs are electrically charged during said burst period except when said second processing means produces said second difference signal.

5,463,582

SEMICONDUCTOR MEMORY DEVICE CAPABLE OF MULTIDIRECTION DATA ACCESS

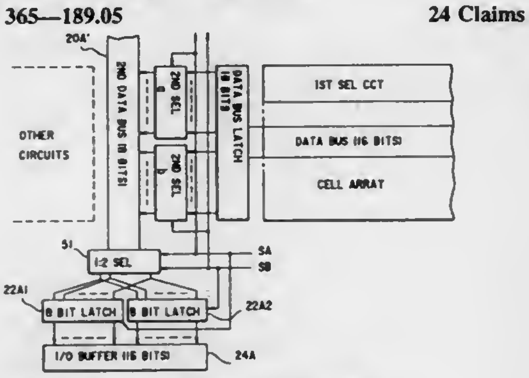
kazuya Kobayashi, Tokyo; Kiyoshi Miyasaka, and Junji Ogawa, both of Yokohama, all of, Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Division of Ser. No. 214,161, Mar. 17, 1994, which is a continuation of Ser. No. 782,719, Oct. 28, 1991, which is a continuation of Ser. No. 483,965, Feb. 15, 1990, which is a continuation of Ser. No. 88,334, Aug. 21, 1987. This application Sep. 21, 1994, Ser. No. 309,647

Claims priority, application Japan, Aug. 22, 1986, 61-196529; Dec. 4, 1986, 61-289677; Dec. 4, 1986, 61-289680; Jan. 19, 1987, 62-009493

Int. Cl.^{6} G11C *13/00*

U.S. Cl. 365—189.05 **24 Claims**



1. A semiconductor memory device comprising:

a plurality of memory blocks each comprising

a plurality of word lines,

a plurality of bit lines,

a plurality of memory cells connected to said bit lines and said word lines,

first selection means, operatively connected to said word lines, for selecting one of said word lines in response to a first address signal, and

second selection means, operatively connected to said bit lines, for receiving plurality of bit data from said bit lines and selecting at least two bit data from said received plurality of bit data in response to a second address signal, a relationship between said at least two bit data and said second address signal being changed in response to an access direction signal which designates one of said access directions; and

third selection means, operatively connected to said second selection means of each memory blocks, for selecting a plurality of bit data from the data selected by said second selection means in response to a third address signal,

wherein another relationship between said third address signal and the plurality of bit data selected by said third address signal is changed by said access direction signal.

5,463,583

NON-VOLATILE SEMICONDUCTOR MEMORY DEVICE

Nobuaki Takashina, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 970,649, Nov. 2, 1992, abandoned, which is a continuation of Ser. No. 545,790, Jun. 29, 1990, abandoned. This application Jan. 10, 1994, Ser. No. 180,798

Claims priority, application Japan, Jun. 30, 1989, 1-168394

Int. Cl.^{6} G11C *11/34*

U.S. Cl. 365—189.06 **4 Claims**

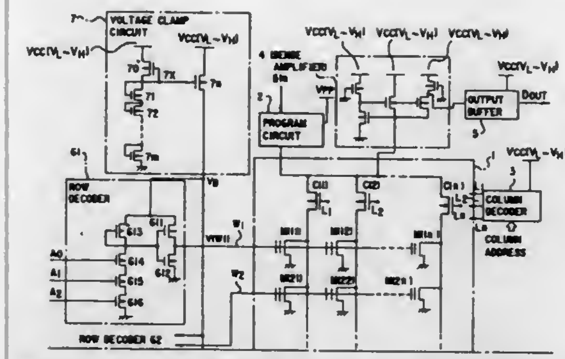
1. A non-volatile semiconductor memory device comprising:

word lines;

bit lines;

memory cell transistors located at intersections of said word lines and said bit lines, connected to said bit lines, and having floating gates and control gates connected to said word lines;

a power source line for supplying a power source voltage; and



selection means for applying a word line selection voltage to select a word line,

wherein, during a reading of data from the memory cell transistor, the word line selection voltage lower than the power source voltage is applied to the word line, and

wherein data written in the memory cell transistor is correctly read even if a predetermined threshold voltage of the memory cell transistor is lowered after a lapse of time due to decrease of the electrons injected to the floating gate of the memory cell transistor.

5,463,584

SEMICONDUCTOR MEMORY DEVICE

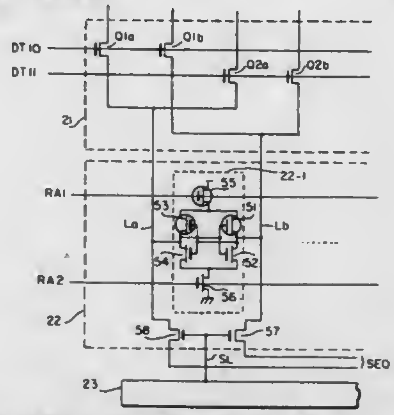
Yasuharu Hoshino, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 693,119, Apr. 29, 1991, abandoned. This application May 16, 1994, Ser. No. 243,009

Claims priority, application Japan, Apr. 27, 1990, 2-112414; Apr. 28, 1990, 2-112266

Int. Cl.^{6} G11C *7/00;8/00*

U.S. Cl. 365—189.05 **4 Claims**



2. A semiconductor memory device comprising:

a memory cell array including a plurality of word lines, a plurality of pairs of bit lines, and a plurality of memory cells, each memory cell being associated with a respective one of said word lines and a respective one of said pairs of bit lines, said pairs of bit lines being arranged into a plurality of groups, each group having a first and a second pair of bit lines;

a plurality of pairs of data bus lines provided in one to one correspondence with said groups;

a first means for generating selection information;

a gate circuit responding to said selection information and coupling said first pair of bit lines in each of said groups to an associated pair of said pairs of data bus lines when said selection information takes a first state and coupling said second pair of bit lines in each of said groups to an associated one of said pairs of data bus lines when said information takes a second state;

a second means for generating a latch control signal; and

a plurality of latch circuits provided in one to one correspondence with said pairs of data bus lines and supplied in common with said latch control signal, each of said latch circuits including first and second nodes, a first transfer gate connected between said first node and one of an associated pair of said pairs of data bus lines, a second transfer gate connected between said second node and the other of said associated one of said pairs of data bus lines, and a data latch portion connected between said first and second nodes and, when activated, amplifying a potential difference between said first and second nodes and holding an amplified potential difference, each of said first and second transfer gates assuming an open state to connect each of said first and second nodes to each of said associated pair of said pairs of data bus lines and said data latch portion being deactivated when said latch control signal takes a first logic level and each of said first and second transfer gates assuming a closed state to disconnect each of said first and second nodes from each of said associated pair of said pairs of data bus lines and said data latch portion being activated when said latch control signal takes a second logic level, said second means setting said latch control signal at said first logic level while said gate circuit is coupling one of said first and second pairs of bit lines in each of said groups to an associated pair of said pairs of data bus lines and thereafter changing said latch control signal to said second logic level, wherein said data latch portion includes a flip-flop circuit having a first and second input/output ends connected respectively to said first and second nodes and a switching transistor coupled between said flip-flop circuit and a power supply line, said switching transistor being coupled to said second means to receive said latch control signal and rendered nonconductive when said latch control signal takes said first logic level to disconnect said flip-flop circuit from said power supply line and conductive when said latch control signal takes said second logic level to connect said flip-flop circuit to said power supply line.

5,463,585

SEMICONDUCTOR DEVICE INCORPORATING VOLTAGE REDUCTION CIRCUIT THEREIN

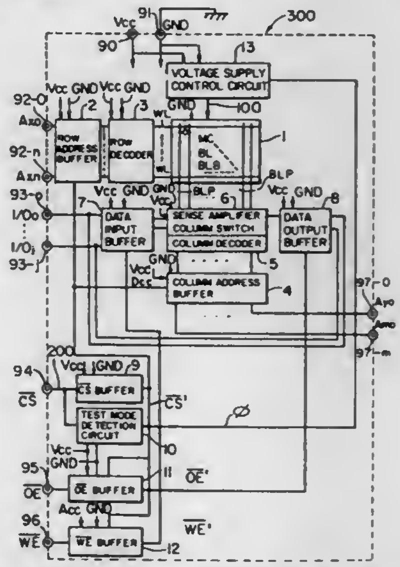
Kohji Sanada, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Apr. 14, 1994, Ser. No. 227,796

Claims priority, application Japan, Apr. 14, 1993, 5-112206

Int. Cl.^{6} G11C *29/00*

U.S. Cl. 365—201 **7 Claims**



1. A semiconductor device comprising storage means having a data input/output node and a power node provided independently of said data input/output node, said storage means inputting and operating on a voltage supplied to said power node, storing data transferred thereto through said data input/output node and output-

ting data stored therein to said data input/output node, a power terminal supplied with a power supply voltage, means coupled to said power terminal for generating a power-down voltage smaller than said power supply voltage, and means for supplying said power node of said storage means with said power-down voltage in a test mode and with said power supply voltage in a normal operation mode.

5,463,586
ERASE AND PROGRAM VERIFICATION CIRCUIT FOR NON-VOLATILE MEMORY

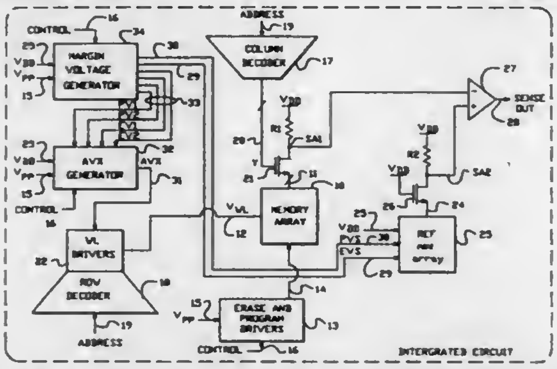
Liang Chao, Hsinchu, China; Tien-Ler Lin, Cupertino, and Tom D. Yiu, Milpitas, both of Calif., assignors to Macronix International Co., Ltd., Hsinchu, Taiwan, Prov. of China

PCT No. PCT/US93/05135, § 371 Date Aug. 31, 1993, § 102(e) Date Aug. 31, 1993

PCT Filed May 28, 1993, Ser. No. 108,670

Int. Cl.^{6} G11C *29/00;16/00*

U.S. Cl. 365—210 **19 Claims**



1. A programmable non-volatile memory device, comprising:

an array of memory cells having respective control terminals and output terminals;

sense circuitry coupled to the output terminals of the memory cells and including at least one reference cell having a control terminal and an output terminal, to detect a state of an addressed memory cell with reference to the output terminal of the at least one reference cell;

driver circuitry, coupled with the array of memory cells and the at least one reference cell, which supplies energizing voltage to the control terminals of selected memory cells and the at least one reference cell, to enable the output terminals of the selected memory cells and the at least one reference cell to indicate a state of the selected memory cells; and

control circuitry, coupled with the driver circuitry, which controls the energizing voltage for the array of memory cells and the at least one reference cell, the control circuitry having a read mode in which the energizing voltage for the array is a read potential and the energizing voltage for the at least one reference cell is a reference read potential, and a verify mode in which the energizing voltage for the array is a first verify potential and the energizing voltage for the at least one reference cell is a second verify potential different from the first verify potential.

5,463,587
NONVOLATILE SEMICONDUCTOR SYSTEM

Akira Maruyama, Suwa, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan

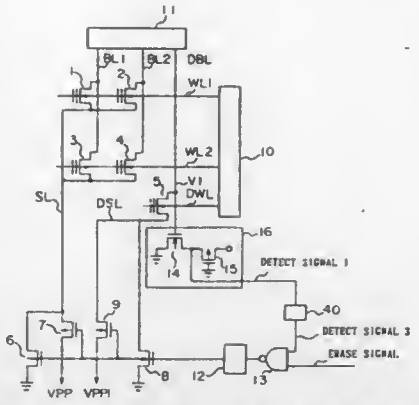
Continuation of Ser. No. 150,054, Nov. 18, 1993, abandoned. This application Feb. 15, 1995, Ser. No. 390,286

Claims priority, application Japan, Mar. 25, 1992, 4-067013

Int. Cl.^{6} G11C *7/02;16/06*

U.S. Cl. 365—210 **22 Claims**

1. A nonvolatile semiconductor system comprising:



a memory transistor comprising a floating gate electrode, a control gate electrode and first and second diffusion layers, said memory transistor storing data by injecting electrons into said floating gate electrode and releasing electrons from said floating gate electrode;

at least one dummy memory transistor comprising a floating gate electrode, a control gate electrode and first and second diffusion layers, a change rate of threshold voltage of said at least one dummy memory transistor being different from a change rate of threshold voltage of said memory transistor;

means for causing electrons to be injected into said at least one dummy memory transistor and for causing electrons to be released from said at least one dummy memory transistor; and

means for detecting the threshold voltage of said at least one dummy memory transistor when the electrons are released from said floating gate electrode of the memory transistor and the at least one dummy memory transistor.

5,463,588
DYNAMIC MEMORY DEVICE HAVING A PLURALITY OF INTERNAL POWER SOURCES

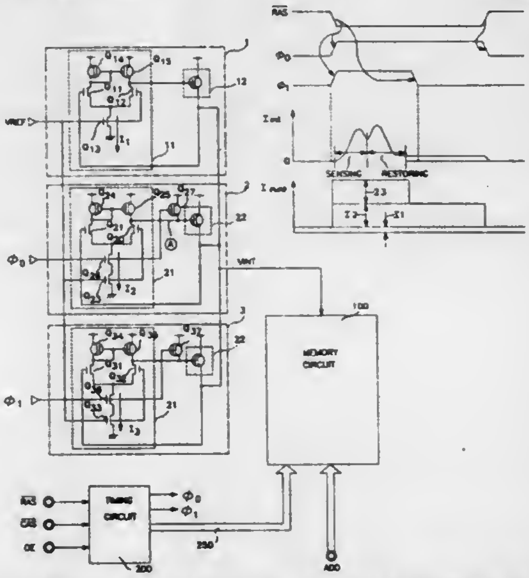
Toru Chonan, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Oct. 3, 1994, Ser. No. 321,813

Claims priority, application Japan, Jan. 6, 1993, 5-276109

Int. Cl.^{6} G11C *11/40*

U.S. Cl. 365—226 **10 Claims**



1. A semiconductor memory device having a standby mode and an active operation mode, said active operation mode including a first period following initiation of said active operation mode and a second period after said first period, said memory device comprising a memory circuit and an internal power source circuit generating and supplying an internal power voltage to said memory

circuit, said internal power voltage being smaller than an external power voltage supplied to said memory device, said internal power source circuit including a power circuit for stabilizing said internal power voltage to a predetermined level with a response speed relative to a current flowing through said power circuit and a current control circuit for changing said current flowing through said power circuit to a first value during said standby mode, a second value larger than said first value during said first period of said active operation mode and a third value larger than said first value and smaller than said second value during said second period of said active operation mode.

5,463,589

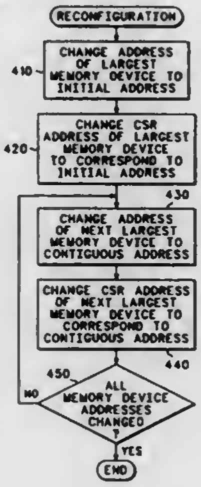
METHOD AND SYSTEM FOR AUTOMATIC CONFIGURATION OF MEMORY DEVICES

Eugene H. Gruender, Jr., Austin; C. W. Clark, Cedar Park, and Douglas R. Kraft, Austin, all of Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 30, 1994, Ser. No. 269,427

Int. Cl.^{6} G06F ***13/00***

U.S. Cl. 365—230.01 9 Claims


RECONFIGURATION
410
CHANGE ADDRESS OF LARGEST MEMORY DEVICE TO INITIAL ADDRESS
420
CHANGE CSR ADDRESS OF LARGEST MEMORY DEVICE TO CORRESPOND TO INITIAL ADDRESS
430
CHANGE ADDRESS OF NEXT LARGEST MEMORY DEVICE TO CONTIGUOUS ADDRESS
CHANGE CSR ADDRESS OF NEXT LARGEST MEMORY DEVICE TO CORRESPOND TO CONTIGUOUS ADDRESS
440
450
NO
ALL MEMORY DEVICE ADDRESSES CHANGED ?
YES
END

1. A method for automatic configuration of memory devices in a computer system upon startup or reset of the computer system, the computer system comprising a processor and the memory devices, each of the memory devices having a same initial address through which the processor accesses the memory devices at startup or reset of the computer system, the method performed by the computer system and comprising the steps of:

(a) disabling all of the memory devices but one enabled memory device;

(b) changing the initial address of the enabled memory device to a new unique address;

(c) enabling, unless all of the memory devices have been enabled, a next one of the memory devices to produce a next enabled memory device;

(d) repeating steps (b) and (c) until the initial address of each of the memory devices has been changed; and

(e) changing an address of one of the memory devices back to the initial address through which the processor accesses the one of the memory devices at startup or reset of the computer system.

5,463,590

MULTI-BANK SEMICONDUCTOR MEMORY DEVICE HAVING COMMON COMMAND DETECTION

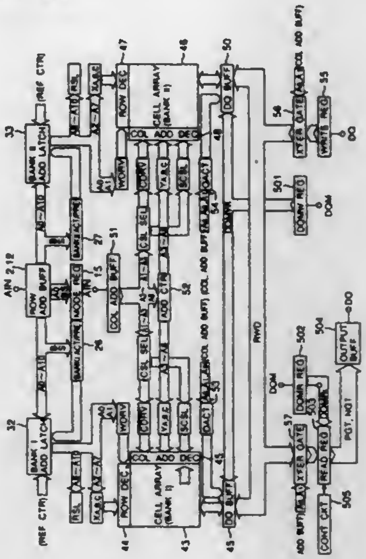
Yuji Watanabe, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Mar. 18, 1994, Ser. No. 210,343

Claims priority, application Japan, Mar. 19, 1993, 5-085220

Int. Cl.^{6} G11C ***11/40***

U.S. Cl. 365—230.03 37 Claims



1. A DRAM, comprising;

a memory, cell array divided into a plurality of banks each having a plurality of dynamic type memory cells arranged into substantially a matrix pattern, data being writable in and readable from each memory cell and further the data written in the memory cells being refreshable;

activating means for activating the memory cells to be read, written and refreshed;

precharging means for precharging data lines connected to the memory cells to be read;

a plurality of address latch sections each provided for each bank, each for latching addresses of the memory cells to be read, written and refreshed, each of said address latch sections being set to a latch status when said bank is activated and to a latch release status when said bank is precharged; and

command detecting means for detecting commands and outputting control signals corresponding to the detected commands to operate the DRAM in correspondence to the respective commands, said command detecting means being composed of a plurality of command detecting circuits each provided for a plurality of said banks in common to detect one command,

said refresh being executed when an auto-refresh command detecting circuit detects that an auto-refresh command is applied thereto periodically, a self-refresh being executed when a self-refresh command detecting circuit outputs a self-refresh command periodically applied thereto to the auto-refresh command detecting circuit.

5,463,591

DUAL PORT MEMORY HAVING A PLURALITY OF MEMORY CELL ARRAYS FOR A HIGH-SPEED OPERATION

Yoshiharu Aimoto, and Tadahiko Sugibayashi, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

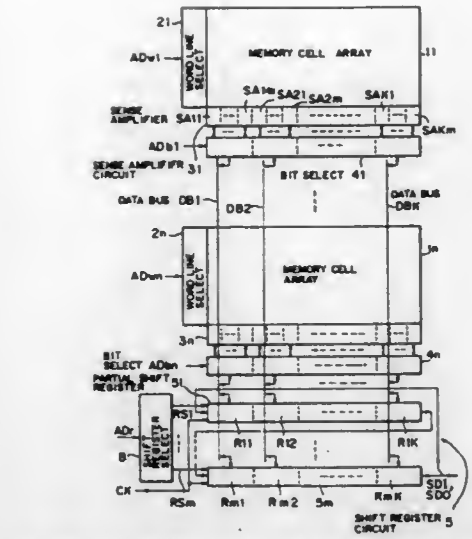
Filed Apr. 6, 1994, Ser. No. 225,450

Claims priority, application Japan, Apr. 6, 1993, 5-078433

Int. Cl.^{6} G11C ***8/00***

U.S. Cl. 365—230.05 7 Claims

1. A dual port memory comprising:



n memory cell arrays each having a plurality of word lines, a plurality of bit lines intersecting said plurality of word lines while insulated therefrom, and a plurality of memory cells, disposed correspondingly to intersections between said bit lines and said word lines, each for outputting data stored therein to corresponding one of said bit lines and for receiving data therefrom, said plurality of bit lines divided into k bit line groups, each of said k bit line groups including m bit lines;

k data buses each operatively connected to each of said k bit line groups of each of said n memory cell arrays;

n bit selecting circuits, disposed correspondingly to said n memory cell arrays, for selecting one of said m bit lines in each of said k bit line groups of said corresponding memory cell array in accordance with bit selection signals thereby effecting data transfer between said one of said m bit lines and said k data buses;

at least one serial access port;

and a shift register circuit connected to said serial access port, wherein said shift register circuit has p serially connected partial shift registers each including k serially connected individual registers operatively connected to each of said k data buses, respectively, said partial shift registers operating for receiving serial bit data from outside through said serial access port and storing said serial data in said individual registers or for transferring serial data stored in said partial shift registers through said k data buses to said one of said n memory cell arrays;

wherein each of said n, k, m and p is an integer not less than two.

5,463,592
DYNAMIC RANDOM ACCESS MEMORY DEVICE HAVING WORD LINE INTERMITTENTLY DRIVEN TO ACTIVE LEVEL

Toru Ishikawa, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jul. 29, 1993, Ser. No. 98,796

Claims priority, application Japan, Jul. 29, 1992, 4-201685

Int. Cl.^{6} G11C *8/00;7/00*

U.S. Cl. 365—230.06 **1 Claim**

1. A semiconductor memory device comprising:

a plurality of word lines;

a plurality of bit lines;

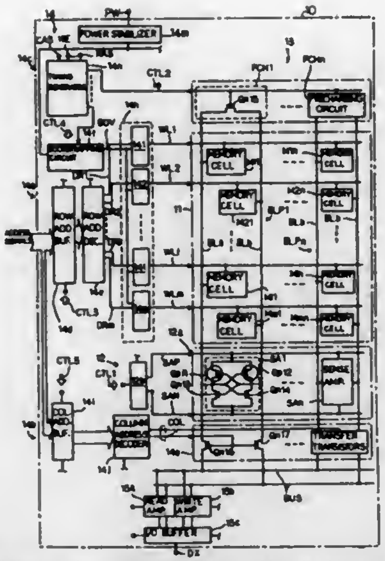
a plurality of memory cells each coupled to one of said word lines and one of said bit lines;

receiving means for receiving an address strobe signal for informing an arrival of a piece of valid address information by changing its Level from an inactive level to an active level;

generating means coupled to said receiving means for generating a first one-shot pulse signal in response to a change in level of said address strobe signal from said inactive level to said active level and further generating a second one-shot pulse signal in response to a change in level of said address strobe signal from said active level to said inactive level;

address decoding means responsive to said piece of valid address information for generating a set of decoded signals for selecting one of said word lines; and

energizing means responsive to said set of decoded signals and said first one-shot pulse signal for energizing one of said word lines during a first period of time defined by said first one-shot pulse signal and further responsive to said set of decoded signals and said second one-shot pulse signal for energizing said one of said word lines during a second period of time defined by said second one-shot pulse signal, said one of said word lines being energized to a first voltage level not higher than a power supply voltage during said first period of time and to a second voltage level higher than said power supply voltage during said second period of time.



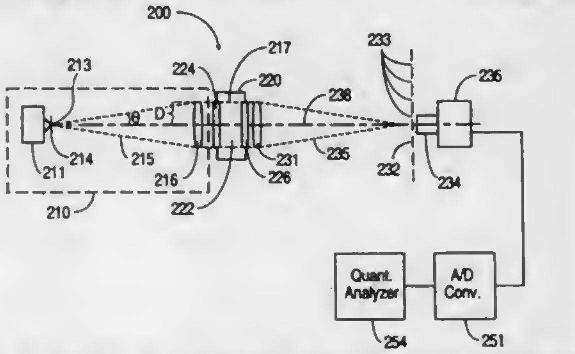
5,463,593
APPARATUS FOR QUANTITATIVE MEASUREMENTS OF ULTRASONIC WAVE POWER DISTRIBUTION

Claudio I. Zanelli, Sunnyvale, and Frank R. Whitehead, Orangevale, both of Calif., assignors to Claudio I. Zanelli, Intec Research Company, Sunnyvale, Calif.

Filed Mar. 14, 1994, Ser. No. 212,759

Int. Cl.^{6} H04B *17/00*

U.S. Cl. 367—13 **30 Claims**



1. An apparatus for quantitatively measuring a characteristic of ultrasonic acoustic waves, comprising:

an immersion tank to contain a medium through which said ultrasonic waves are passed;

a source of substantially parallel light oriented with respect to said medium so that said substantially parallel light enters said medium along a first axis;

- a spatial filter positioned to block a portion of light that emerges from said medium, wherein said portion of light blocked includes zero-th order diffracted light that emerges from said medium in a direction substantially parallel to said first axis;
- a camera positioned to image said light emerging from said medium that is not blocked by said spatial filter; and
- a quantitative analyzer coupled to said camera wherein said quantitative analyzer generates a quantitative measure of said characteristic of said ultrasonic waves passing through said medium.

5,463,594

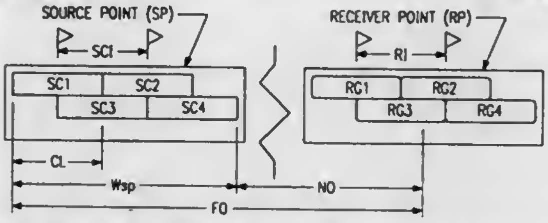
HIGH FREQUENCY RETENTION SEISMIC SURVEY METHOD

Joe P. Lindsey, 314 Lakeway Dr., Coldspring, Tex. 77331, and James R. Patch, 7058 Sharpcrest, Houston, Tex. 77074

Continuation-in-part of Ser. No. 980,661, Nov. 24, 1992, abandoned. This application Aug. 20, 1993, Ser. No. 110,504

Int. Cl.^{6} G01V *1/36*

U.S. Cl. 367—38 **47 Claims**



5. A process for creating high quality field records in seismic data gathering comprising:

- a) generating a first seismic signal at a source point;
- b) receiving reflections of the first seismic signal at a plurality of receivers, and receiving noise at the plurality of receivers while receiving the reflections of the first seismic signal, the reflections and the noise defining a first received signal;
- c) recording the first received signal, thus defining a recorded signal;
- d) generating a second seismic signal at a source point;
- e) receiving reflections of the second seismic signal at a plurality of receivers, and receiving noise at the plurality of receivers while receiving the reflections of the second seismic signal, the reflections and the noise defining a second received signal;
- f) adding the second received signal to the recorded signal, thus defining an added signal, the ratio of the amplitude of the reflections of the seismic signal in the added signal to the amplitude of the noise in the added signal defining a signal-to-noise ratio;
- g) recording the added signal, to replace the recorded signal;
- h) repeating steps d through f until the signal-to-noise ratio is 0.2 or greater.

5,463,595

PORTABLE SECURITY SYSTEM FOR OUTDOOR SITES

Arne Rodhall, 22313 76th Ave. W., Edmonds, Wash. 98026, and Donald E. Taylor, 1119 Cascade Dr., Everett, Wash. 98203

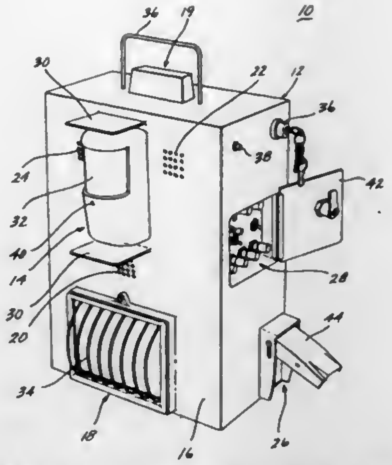
Filed Oct. 13, 1993, Ser. No. 135,795

Int. Cl.^{6} G01S *9/66;* **G08B** *23/00*

U.S. Cl. 367—93 **18 Claims**

1. A portable security system suitable for protection of property within a monitored area from human intruders, the security system comprising:

- a portable housing;
- a detector mounted on the housing for sensing an intrusion event within the monitored area and producing a detection signal when an intrusion event is detected;
- a first alarm generator mounted within the housing for producing an output signal effective at clearing the monitored area of non-human animal intruders, the output signal not being alarming to humans;



- a second alarm generator mounted within the housing for producing a second alarm capable of startling a human intruder;
- a controller mounted within the housing for sequentially activating the first alarm generator for a predetermined period of time in response to the detection signal from the detector and thereafter activating the second alarm generator if the detector is then producing the detection signal; and
- a power supply for powering the detector, the first and second alarm generators and the controller.

5,463,596

NONINVASIVE ULTRASONIC PROXIMITY DETECTOR FOR A FLUID ACTUATED CYLINDER

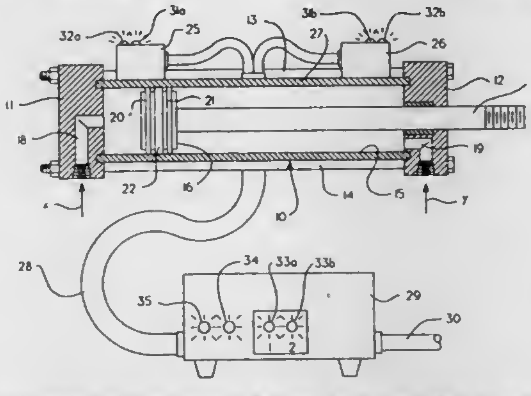
Allen J. Siefken, Lake Oswego, Oreg., assignor to The Rexroth Corporation, Lexington, Ky.

Continuation of Ser. No. 27,370, Mar. 8, 1993. This application Oct. 3, 1994, Ser. No. 316,897

The portion of the term of this patent subsequent to Oct. 17, 2012, has been disclaimed.

Int. Cl.^{6} G01S *15/00*

U.S. Cl. 367—98 **26 Claims**



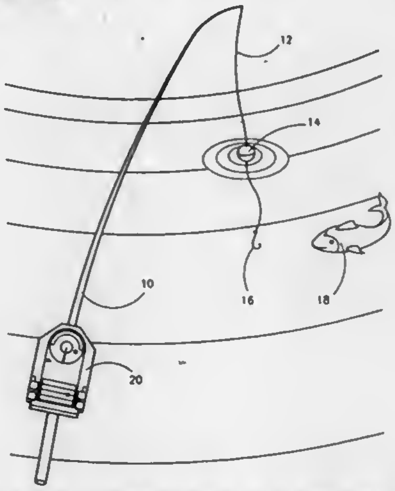
1. A noninvasive proximity detector device operable to detect a reciprocative piston located within a cylinder bore defined by a cylinder wall, said device comprising:

- at least one piston sensor positionable adjacent an outer surface of said cylinder wall at a selected sensing location;
- said piston sensor including ultrasonic transducer means for selectively generating an ultrasonic signal directed through said cylinder wall into said cylinder bore;
- said ultrasonic transducer means further operative after generation of said ultrasonic signal to receive at least a portion of said ultrasonic signal after propagation thereof through said cylinder wall; and
- control means responsive to an electrical output of said ultrasonic transducer means to detect a position of said piston, wherein said control means is operative to detect a signal level in said at least a portion of said ultrasonic signal after

propagation thereof through said cylinder wall and at least a portion of said cylinder bore during a sample time interval synchronized to have a start time a selected duration after generation of said ultrasonic signal, said sample time interval corresponding to period beginning a selected duration after receipt by said ultrasonic transducer means of an ultrasonic reflection from an interface defined by an inner surface of said cylinder wall.

5,463,597
FISH LOCATOR

Amos Harlev, Doar na Merkaz, Israel, assignor to Trigon Research & Development Co., Tel Aviv, Israel
Continuation of Ser. No. 61,936, May 17, 1993, abandoned.
This application Dec. 12, 1994, Ser. No. 354,346
Claims priority, application Israel, Jun. 12, 1992, 102182
Int. Cl.⁶ G01S *15/96*
U.S. Cl. 367—107 **18 Claims**

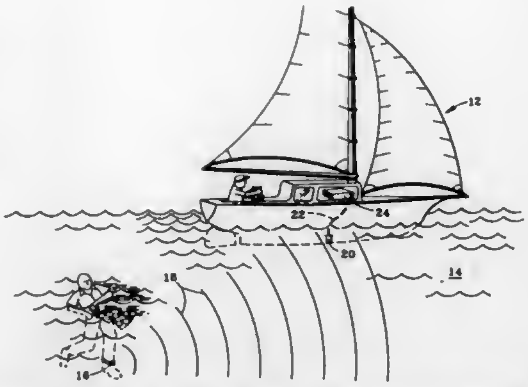


1. A system for communicating to a fisherman information relating to fish in water in the vicinity of a fishing lure or hook which is connected to a conventional non-electrically conducting fishing line, comprising:
(a) a float attached to a conventional non-electrically conducting fishing line, said float located at or below the water surface;
(b) a sensor for detecting a parameter relating to the fish, said sensor being housed in said float;
(c) an electronic card housed in said float;
(d) a transmitter for wirelessly transmitting said signal, said transmitter housed in said float;
(e) a power source housed in said float for exclusively providing electrical energy to said sensor and to said transmitter;
(f) a receiver for receiving said signal from said transmitter; and
(g) an output means for presenting information relating to said signal to the fisherman.

5,463,598
MAN OVERBOARD ALERT AND LOCATING SYSTEM

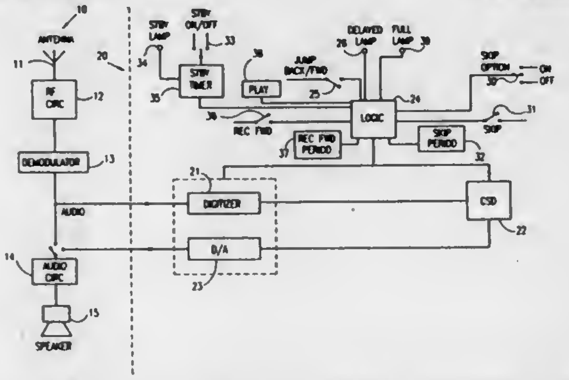
Malcolm J. Holland, Stowe, and Michael J. Rainey, Roxbury, both of Vt., assignors to SafeSea Systems, Inc., Stowe, Vt.
Filed Aug. 12, 1994, Ser. No. 289,772
Int. Cl.⁶ G01S *11/14*
U.S. Cl. 367—131 **8 Claims**

1. An automatic alert and locating system comprising:
a portable ultrasonic transmitter capable of transmitting an ultrasonic signal through water,
an ultrasonic receiver adapted to be immersed in water and further adapted to sense the signal produced by said transmitter, and
means coupled to said receiver for determining from the received signal the magnitude and direction of the velocity of said receiver with respect to said transmitter.



5,463,599
RADIO RECEIVER AND BUFFER SYSTEM THEREFOR

Aharon Yifrach, 19 Ayalon Street, Ashkelon, Israel, and David S. Newman, 16,500 N. Park Dr., Apt. 1917, Southfield, Mich. 48075
Filed Aug. 23, 1994, Ser. No. 294,743
Int. Cl.⁶ H04H *9/00*
U.S. Cl. 369—7 **20 Claims**



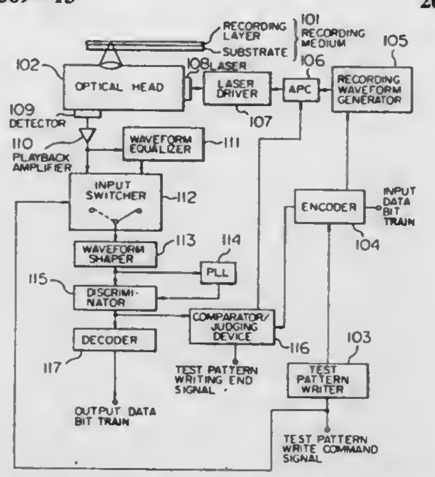
1. A buffer system for radio receivers having a processing circuit outputting audio signals to an audio analog circuit for reproduction as sounds, said buffer system comprising:
an analog-to-digital converter for converting to digital form the analog signals outputted by the processing circuit;
a digital cyclic storage device connected to the processing circuit for continuously storing in digital form the audio signals last outputted thereby over a predetermined time interval;
and a control circuit including a mode selector comprising:
a Skip-Mode manual switch actuatable to select a Skip Mode, in which the audio circuit is connected to receive the signals from the cyclic storage device at first with a slowly increasing delay from real-time such as not to unduly distort the audio signals until the delay reaches the predetermined time interval of the cyclic storage device, and thereafter with a delay from real-time equal to that of the predetermined time interval of the cyclic storage device;
and a Skip manual switch actuatable to connect the audio circuit to receive the audio signals from the processing circuit in real-time, and thus to skip the portion of the audio signals from the processing circuit equal to that of said predetermined time interval of the cyclic storage device.

5,463,600

MAGNETO-OPTICAL RECORDING SYSTEM USING RECORDING WAVEFORM HAVING A PLURALITY OF POWER LEVELS PROVIDING HIGH RECORDING DENSITY

Fumiyoshi Kirino, Tokyo; Atsushi Saito, Ichikawa; Tsuyoshi Toda; Hiroshi Ide, both of Kodaira; Hiroyuki Tsuchinaga; Takeshi Maeda, both of Kokubunji, and Fumio Kugiya, Hachioji, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 8, 1994, Ser. No. 225,315
Claims priority, application Japan, Apr. 15, 1993, 5-088391
Int. Cl.^{6} G11B *13/04*
U.S. Cl. 369—13 **26 Claims**



1. A magneto-optical disk drive for recording, reproducing, and erasing data by using a laser beam, comprising:

means for rotating a magneto-optical disk at a predetermined rotation speed;

means for modulating code information to be recorded, in accordance with a predetermined modulation scheme; and

means for recording an ellipsoidal recorded domain on said magneto-optical disk, the opposite ends of said ellipsoidal recorded domain corresponding to "1" of said modulated code information, and the bit length of said ellipsoidal recorded domain in the radial direction of said magneto-optical disk being maintained generally constant;

wherein said magneto-optical disk has two laminated layers each including

a transparent substrate having a guide groove and pre-pits and a diameter of 5.25 inches;

a first inorganic compound dielectric layer;

a magneto-optical recording layer having a vertical magnetic anisotropy, and

a second inorganic compound dielectric layer, and a light reflecting layer,

wherein said two laminated layers are adhered together with each said substrate facing outward and protective resin is coated thereon to complete said magneto-optical disk;

wherein a waveform of said laser beam used for recording and reproducing code information has a plurality of power levels;

wherein said power levels include:

a first level for use in reproducing code information;

a second level for use in controlling the temperature of said recording layer of said magneto-optical disk constant so as to be independent from an operating environmental temperature and a write code data pattern; and

third and fourth levels in combination for use in controlling a maximum temperature of said recording layer during code information recording; and

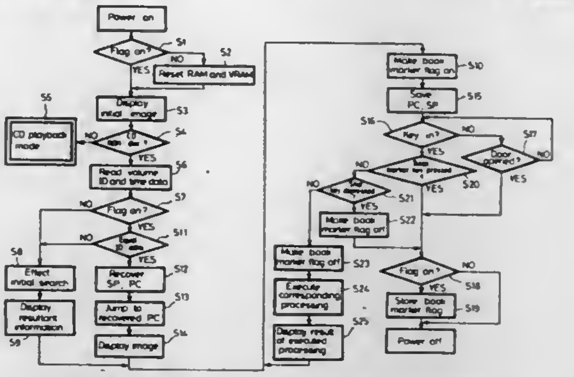
wherein said first to fourth levels are set to such values so as to maintain a domain width constant and control the domain length at a high precision.

5,463,601

CD-ROM DISC REPRODUCING APPARATUS WITH MEANS FOR STORING PROGRESSION DATA OF A CONTROL MEANS

Tetsu Yanagisawa, Saitama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Apr. 7, 1993, Ser. No. 44,132
Claims priority, application Japan, Apr. 8, 1992, 4-087331
Int. Cl.^{6} G11B *17/22*
U.S. Cl. 364—32 **9 Claims**



1. A CD-ROM disc reproducing apparatus comprising:

a) disc drive means for reproducing data from a CD-ROM disc;

b) control means coupled to said disc drive means for executing a program to control operations of said disc drive means;

c) input means including at least first stop means, second stop means, playback means, and alpha-numeric means for entering data and command signals to said control means;

d) display means for displaying at least the data reproduced from said CD-ROM disc by said disc drive means; and

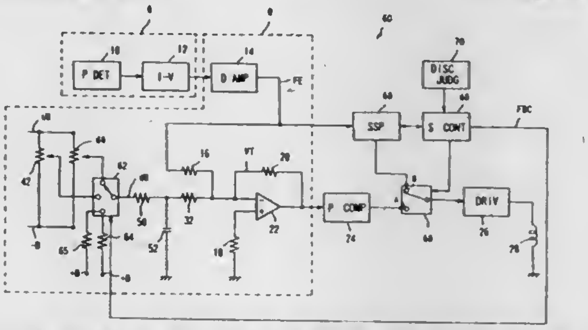
e) memory means coupled to said control means for effectively storing progression data of the program responsive to said second stop means being operated when said control means is an input waiting condition.

5,463,602

REPRODUCING APPARATUS WHICH CAN PLAY MULTIPLE TYPES OF DISCS AND BIASES FOCUSING ERROR SIGNAL BASED ON DISC TYPE

Nobuyuki Oka; Toshio Sato, both of Kanagawa, and Masayuki Mizuki, Tokyo, all of, Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 98,966, Jul. 28, 1993, abandoned.
This application Jan. 17, 1995, Ser. No. 373,481
Claims priority, application Japan, Aug. 4, 1992, 4-228006
Int. Cl.^{6} G11B *7/00*
U.S. Cl. 369—44.29 **3 Claims**



1. An optical disc reproduction apparatus for reproducing data from a first type of optical disc on which the data is recorded by pits, a portion of the data recorded on the first type of disc being a first discriminating data, and from a second type of optical disc on which data is recorded by pits in a first region, a portion of the data recorded by pits in the first region of the second type of optical disc being a second discriminating data, and on which data is

recorded along a pregroove by a magneto-optical recording method in a second region of the second type of optical disc, the apparatus comprising:

- a light receiving means for receiving the reflected light of a light beam irradiated from an optical pick-up to a disc;
- a generation means for generating a focus error signal by using the signal supplied from said light receiving means;
- a first bias voltage generation means for generating a first non-zero, predetermined, bias voltage;
- a second bias voltage generation means for generating a second non-zero, predetermined, bias voltage;
- a switching means for selectively providing one of said first and second bias voltages;
- a control means for controlling the switching means to provide one of the first and second bias voltages, based on the type of disc, wherein said control means, when the disc is of the second type, controls the switching means from providing one of said first and second bias voltages to providing the other of said first and second bias voltages when the light beam irradiated from the optical pick-up to the disc moves from the first region to the second region and from the second region to the first region;
- an adding means for adding the first or second bias voltage provided by the switching means to the focus error signal; and
- a driving means for driving an object lens of the optical pick-up based on the signal outputted from said adding means.

5,463,603

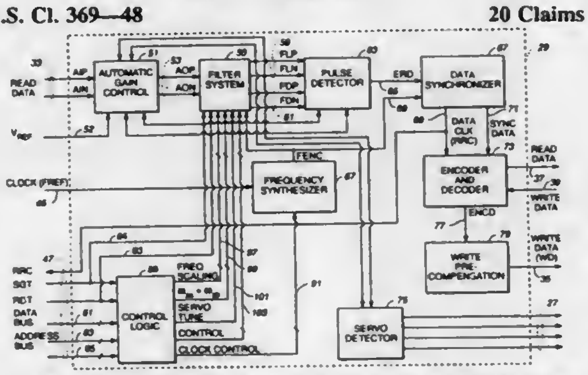
COMPUTER DISK DRIVE INTEGRATED DATA PATH CIRCUIT OPTIMIZED FOR HANDLING BOTH DATA AND SERVO SIGNALS

Corey D. Petersen, Pleasanton, Calif., assignor to IMP, Inc., San Jose, Calif.

Continuation-in-part of Ser. No. 902,716, Jun. 23, 1992, abandoned, which is a continuation-in-part of Ser. No. 852,314, Mar. 18, 1992, abandoned. This application Jan. 29, 1993, Ser. No. 11,191

Int. Cl.⁶ G11B *20/12*

U.S. Cl. 369—48 **20 Claims**



1. An electronic circuit adapted to be used as part of a mass storage system by receiving a signal from a read head that includes data having bursts of servo head positioning pulses distributed therein, and by receiving control signals that indicate when said read head signal contains data and when it contains the servo burst, comprising:

- automatic gain control means receiving said read head signal and responsive to said control signals for maintaining an output signal of both the data and servo bursts within common preset upper and lower limits,
- filter means receiving the output of said automatic gain control means and responsive to said control signals for setting different frequency characteristics when receiving the servo bursts than when receiving data, said filter means including a low pass filter having a programmable cutoff frequency response and means responsive to said control signals for alternately switching said filter cutoff frequency between a servo burst value when receiving the servo bursts and a data value when receiving data, and
- pulse detector means receiving an output of said filter means and responsive to said control signals for generating pulses corresponding to said read head signal by use of at least one threshold level that is different when receiving the servo bursts than when receiving said data, said pulse detector means including a threshold detector having a programmable threshold and means responsive to said control signals for alternately switching said threshold between a first value when receiving the servo bursts and a second value when receiving data,

whereby characteristics of a single set of gain control, filter and pulse detector means are optimized for both the servo bursts and the data.

5,463,604

OPTICAL DISC WITH DATA RECORDED AT DIFFERENT RATES ON DIFFERENT ZONES AND RECORDING APPARATUS, AND REPRODUCING APPARATUS THEREFOR

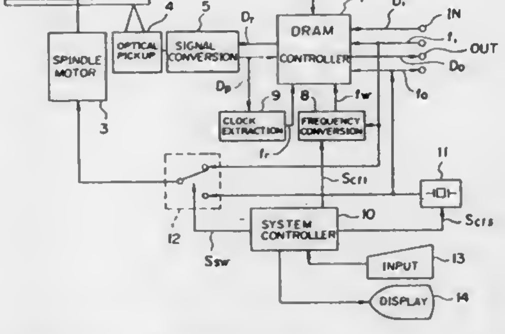
Ryuichi Naito, Tokorozawa, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Mar. 2, 1993, Ser. No. 25,175

Claims priority, application Japan, Mar. 13, 1992, 4-055201; Sep. 1, 1992, 4-233544

Int. Cl.⁶ G11B *7/00*

U.S. Cl. 369—50 **12 Claims**



1. An optical disc recording apparatus for dividing an information record surface of an optical disc into a plurality of record zones and recording information at a data rate which differs for every record zone, said optical disc recording apparatus comprising:

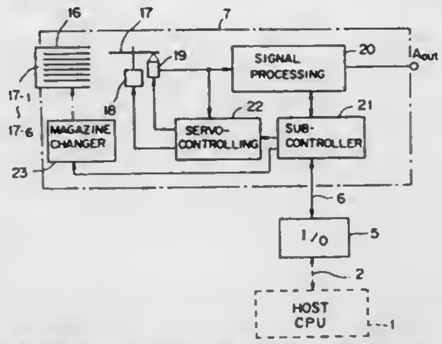
- a drive means for rotationally driving the optical disc by a constant angular velocity;
- a frequency conversion means for converting a clock frequency of input clock data corresponding to record data inputted from the external which is to be recorded on the optical disc, to record clock data, which frequency is a predetermined function of the clock frequency of the input clock data, and is varied corresponding to the record zone to be recorded, and outputting the record clock data;
- a memory means for storing the record data by a timing corresponding to the input clock data, and outputting the record data on the basis of the record clock data; and
- a record means for recording the record data outputted from the memory means, to the optical disc,

wherein the input clock data is inputted to said drive means, and said drive means drives the optical disc by the constant angular velocity based on the input clock data.

5,463,605
METHOD OF PROCESSING INFORMATION OF RECORDING DISC AND APPARATUS FOR PROCESSING THE SAME

Junichi Nishida; Morio Araki; Takeharu Arakawa; Tessho Ishida; Yasushiro Ayukai; Toshiharu Baba; Masahiko Sakaguchi; Kenichi Nobe; Michihiro Kaneko, and Jun Shinohara, all of Kawagoe, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Continuation of Ser. No. 59,423, May 4, 1993, abandoned.
This application Feb. 13, 1995, Ser. No. 388,341
Claims priority, application Japan, May 8, 1992, 4-116446
Int. Cl.^{6} G11B *7/00*
U.S. Cl. 369—58 8 Claims



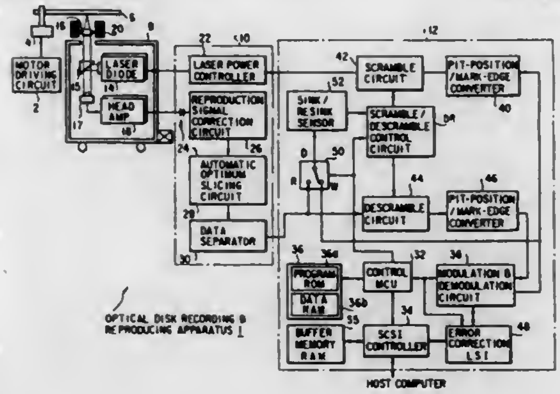
5. An apparatus for reproducing a recording disc among a plurality of recording discs having different standards or recording formats, comprising:

- an exchanging means for selecting one recording disc to be reproduced among the plurality of recording discs, and exchanging said one recording disc by another recording disc among the plurality of recording discs;
- a reproducing means for reproducing recording information on the basis of an application program for said one recording disc; and
- controlling means for controlling said exchanging means so that said exchanging is governed by whether or not said another recording disc, has the same standard or recording format and is reproducible by the same application program as for said one recording disc, after the recording information on said one recording disc is reproduced by the reproducing means.

5,463,606
OPTICAL INFORMATION READING AND REPRODUCING APPARATUS USING PSEUDO DC-FREE CODES

Nobuyuki Kaneko, and Wataru Katsuhara, both of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Japan

Filed Dec. 10, 1993, Ser. No. 165,093
Claims priority, application Japan, Dec. 22, 1992, 4-342750; Jan. 8, 1993, 5-002118
Int. Cl.^{6} H04N *5/76*
U.S. Cl. 369—59 8 Claims



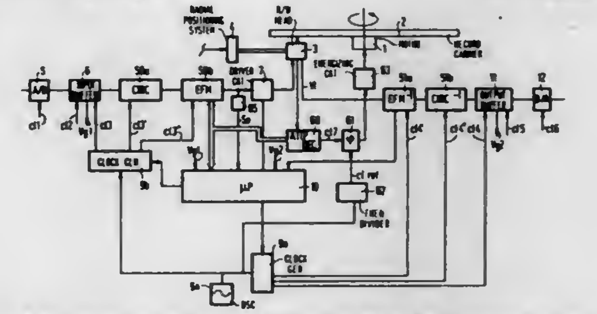
1. An optical information recording and reproducing apparatus which, on the basis of non-DC-free information, records information on a recording medium, the recording medium having a synchronization area in which synchronization information is recorded and a recording area for recording information, comprising:

- random information generating means for generating predetermined random information;
- recording information generating means for generating recording information on the basis of said non-DC-free information and said predetermined random information from said random information generating means;
- synchronization sensing means for sensing said synchronization information recorded in said synchronization area;
- recording means for recording said recording information from said recording information generating means in said recording area on the basis of said synchronization information sensed by said synchronization sensing means; and
- reproducing means for reproducing said recording information recorded by said recording means.

5,463,607
SYSTEM FOR RECORDING AND READING INFORMATION ON A RECORD CARRIER AT A CONSTANT SCANNING SPEED INDEPENDENT OF THE BIT RATE OF SUCH INFORMATION

Rudolf Roth, and Johannes C. Van Offenbeek, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 896,803, Jun. 9, 1992, Pat. No. 5,212,678, which is a continuation of Ser. No. 590,392, Sep. 28, 1990, abandoned. This application Jan. 12, 1993, Ser. No. 3,345
Claims priority, application Netherlands, Nov. 23, 1989, 8902895
Int. Cl.^{6} G11B *5/09;7/00*
U.S. Cl. 369—60 27 Claims



16. A system for recording a record digital signal having successive first signal portions on a track of a record carrier, and subsequently reading said track to obtain a read digital signal having successive second signal portions and substantially corresponding to the record signal recorded on said track, the system comprising:

- scanning means for producing a scanning spot which scans said track;
- write means for using the scanning spot to record the first signal portions on said track;
- read means for using the scanning spot to read said track to obtain the second signal portions;
- an input buffer memory for successively temporarily storing the first signal portions prior to recording them on said track, the first signal portions stored in said input buffer memory being subsequently read-out therefrom to said write means for recording on said track;
- write control means for (i) interrupting read-out of the first signal portions stored in said input buffer memory, and causing said scanning means to skip the scanning spot back to a previous track location and continue scanning therefrom, and (ii) resuming read-out of the first signal portions stored in said input buffer memory when said scanning spot again reaches the track location at which scanning was previously inter-

rupted, interruption of read-out of the first signal portions stored in said input buffer memory being such that the degree of filling of said input buffer is maintained within predetermined limits;

an output buffer memory for successively temporarily storing the second signal portions obtained by said read means, the second signal portions stored in said output buffer memory being subsequently read-out therefrom; and

read control means for (i) interrupting storing of the second signal portions in said output buffer memory, and causing said scanning means to skip the scanning spot back to a previous track location and continue scanning therefrom, and (ii) resuming storing of the second signal portions in said output buffer memory when the scanning spot again reaches the track location at which scanning was previously interrupted, interruption of storing of the second signal portions in said output buffer memory being such that the degree of filling of said output buffer memory is maintained within predetermined limits;

whereby a predetermined constant scanning speed may be used to record the first signal portions and read said track to obtain the second signal portions.

5,463,608

APPARATUS FOR REPRODUCING OPTICAL RECORD MEDIUM

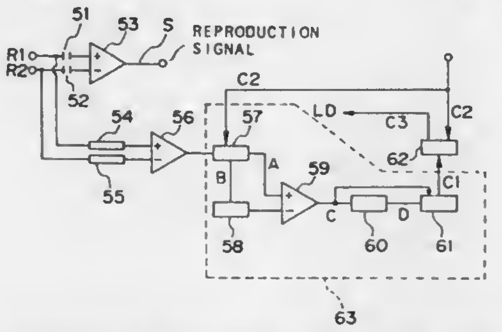
Takanobu Higuchi, Tsurugashima, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Mar. 15, 1995, Ser. No. 404,538

Claims priority, application Japan, Mar. 17, 1994, 6-047562

Int. Cl.^{6} G11B *7/135*

U.S. Cl. 369—109 **6 Claims**



1. An apparatus for reproducing an optical record medium by irradiating the optical record medium with a reading light, said apparatus comprising:

a light irradiation means for irradiating the optical record medium with the reading light;

a separation means for separating the reading light reflected by the optical record medium into a first light component which has a first polarization condition and a second light component which has a second polarization condition;

a first receiving means for receiving said separated first light component and outputting a first readout signal indicating the received first light component;

a second receiving means for receiving said separated second light component and outputting a second readout signal indicating the received second light component;

a reproduction means for reproducing information recorded in the optical record medium in response to the first and second readout signals;

a first differential signal output means for outputting a first differential signal representing a difference between the first readout signal and the second readout signal;

a double refraction eliminating means for eliminating an effect of double refraction caused by a reflection of the reading light on the optical record medium from the first differential signal and outputting a second differential signal; and

a first control means for controlling a power of the reading light from the light irradiation means so that a direct-current component of the second differential signal is constant.

5,463,609

INFORMATION RECORDING AND REPRODUCING DEVICE AND A METHOD USING THE SAME

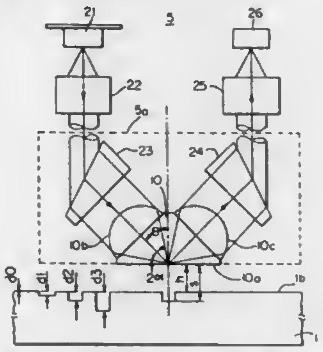
Tatsuhiko Inagaki, Takatsuki; Hiroshi Kohso, Fujiidera, and Makoto Kuwamoto, Hirakata, all of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Oct. 20, 1993, Ser. No. 139,573

Claims priority, application Japan, Jan. 23, 1992, 4-285756

Int. Cl.^{6} G11B *5/68*

U.S. Cl. 369—112 **28 Claims**



1. An information recording and reproducing apparatus comprising:

a recording medium including a plurality of concavo-convex pits,

a light source for emitting laser light,

a means for changing an optical characteristic value of said laser light, using interaction between said laser light and said recording medium, and

a light detector for detecting said optical characteristic value of said laser light after said interaction occurs, and then outputting a signal in response to said detected optical characteristic value;

wherein said means for changing said optical characteristic value includes an evanescent wave generating means for generating an evanescent wave from said laser light, and said evanescent wave generating means changes said optical characteristic value in accordance with how much said concavo-convex pits of said recording medium influences said evanescent wave, the spacing between said evanescent wave and said concavo-convex pits being such that said concavo-convex pits substantially influence said evanescent wave; and

multivalued data is reproduced on the basis of said signal from said light detector, said multivalued data corresponding to the dimension of said concavo-convex pits measured along the direction normal to said recording medium.

5,463,610

TWO-BEAM OPTICAL HEAD FOR FORMING FIRST AND SECOND LIGHT SPOTS ON A RECORDING MEDIUM

Koichiro Nishikawa, Takasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 5, 1994, Ser. No. 222,872

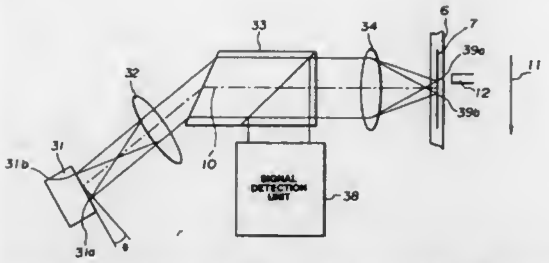
Claims priority, application Japan, Apr. 22, 1993, 5-117659

Int. Cl.^{6} G11B *7/08;7/12*

U.S. Cl. 369—121 **18 Claims**

1. A two-beam optical head comprising:

a light source unit including first and second light-emitting points for emitting first and second light beams, respectively, the first and second light beams having a wavelength difference Δλ therebetween;



an optical system, having a chromatic aberration, for causing the two light beams to pass along substantially a common optical path, and for forming first and second light spots on an information recording medium by the first and second light beams, respectively, said light source unit being inclined with respect to a plane perpendicular to an optical axis of said optical system to focus the light spots on a common plane of the recording medium by said optical system.

5,463,611
LOADING APPARATUS OF A MULTI-DISC PLAYER

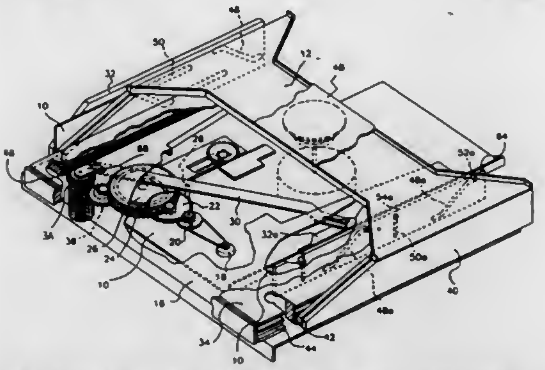
Jungtae Kim, Seoul, Rep. of Korea, assignor to Daewoo Electronics Co., Ltd., Seoul, Rep. of Korea

Filed Nov. 30, 1993, Ser. No. 159,657

Claims priority, application Rep. of Korea, Nov. 30, 1992, 92-22901

Int. Cl.⁶ G11B ***17/04;17/08***

U.S. Cl. 369—191 6 Claims



1. A loading apparatus of a multi-disc player comprising:

a stationary chassis having a vertical plate with a vertical guide opening and a first guide pin projected from an outer surface thereof;

a tray base for mounting a disc tray thereon, which is combined integrally with a chuck arm via an outer vertical plate having a second guide pin protruding from an outer surface thereof, said tray base being located above said stationary chassis;

a cam gear located on said stationary chassis via a rotary shaft and rotated by a drive means, said cam gear having a spiral cam groove on an upper surface thereof and a rotation prevention projection on a lower surface thereof, said spiral cam groove being extended clockwise and radially and having a first quarterly portion being eccentric and a second portion being concentric with respect to the rotary shaft;

a lift arm provided with a pivotal pin at a lower center portion thereof and rotatably connected to said cam gear, said lift arm being pivoted on said pivotal pin in accordance with the rotation of said cam gear;

an outer and an inner sliding plate, each of which is movably connected to respective ends of said lift arm so as to lift the combination of said chuck arm and said tray base, said inner sliding plate having a third guide pin, said outer sliding plate having a horizontal guide opening into which the first guide pin is slidably fitted and an inclined guide opening into which the second guide pin is slidably fitted; and

a shifting means for shifting said disc tray forwards or backwards, said shifting means having a shifting gear connected to said cam gear so that the rotation prevention projection prevents a rotary power of said cam gear from being transmitted to said shifting gear, said shifting gear being rotationally fixed to said tray base and being meshed with a shifting rack formed on an inner side of said disc tray and said shifting means having a power transmission gear meshed with said cam gear and said shifting gear.

5,463,612
OBJECTIVE LENS DRIVE APPARATUS USED IN OPTICAL INFORMATION RECORDING/REPRODUCING APPARATUS

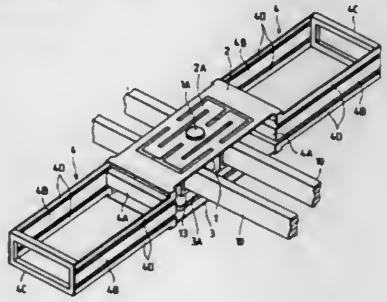
Nobuaki Date, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

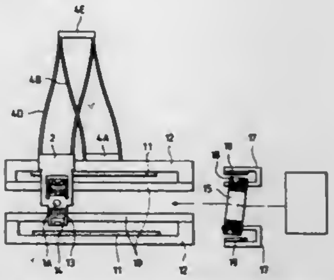
Continuation of Ser. No. 983,723, Dec. 1, 1992, abandoned. This application Sep. 1, 1994, Ser. No. 298,313

Claims priority, application Japan, Dec. 5, 1991, 3-348357

Int. Cl.⁶ G11B ***7/08***

U.S. Cl. 369—219 6 Claims





1. An objective lens drive device used in an optical information recording/reproducing apparatus to effect at least one of recording and reproducing of information by irradiating a light spot onto a disk-like recording medium, said device comprising:

an objective lens for forming the light spot on the recording medium;

an objective lens holding member for holding said objective lens;

a yoke arranged along a radial direction of the recording medium;

a permanent magnet arranged along the radial direction of the recording medium to face said yoke with a predetermined gap;

a coil provided on said holding member and disposed within the predetermined gap; and

a supporting member for supporting said objective lens holding member movably in the radial direction of the recording medium, said supporting member comprising: (i) a first parallel plate spring fixed to said yoke at one end thereof and extending in a direction perpendicular to the direction along which said objective lens holding member moves, said first parallel plate spring having a primary deformation direction, which is substantially coincident with the radial direction of the recording medium, and (ii) a second parallel plate spring arranged parallel to said first parallel plate spring and fixed to a side of said objective lens holding member at one end thereof and extending in the direction perpendicular to the direction along which said objective lens holding member moves, said second parallel plate spring having a primary deformation direction, which is substantially coincident with the radial direction of the recording medium and being connected to said first parallel plate spring with the other end thereof,

wherein said objective lens holding member is moved in the radial direction of the recording medium so as to effect tracking and seeking operations of the light spot by a driving force generated by current flowing in said coil and a magnetic field generated in the predetermined gap.

5,463,613

MOTOR DRIVE UNIT FOR A RECORD PLAYER

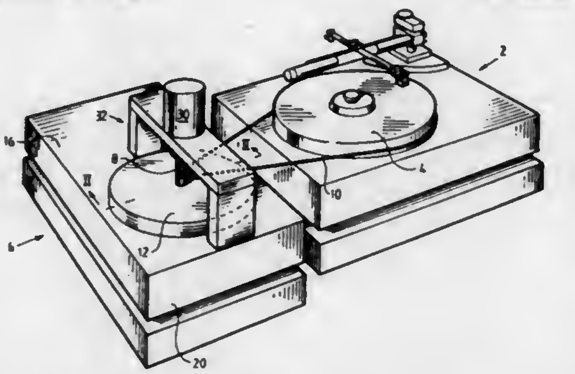
Peter Forsell, Goetalandsvaegen 188, Aelvsjoe, Sweden

Filed Mar. 25, 1993, Ser. No. 37,613

Claims priority, application Sweden, Mar. 27, 1992, 9200956

Int. Cl.^{6} G11B *3/60*

U.S. Cl. 369—266 **19 Claims**



1. A motor drive for an analogue record, comprising:

a turntable adapted to carry a record player and having a periphery;

an output shaft for rotating said turntable;

a belt extending around said output shaft and the periphery of said turntable;

a disc rotatably supported in line with and connected to said output shaft for rotation therewith, said disc having a diameter substantially greater than the diameter of said output shaft such that the disc imparts a relatively uniform rotational speed to the output shaft; and

a motor for rotating said disc with a speed considerably greater than a speed of said turntable, the speed of the disc being at least 20 times the speed of the record player.

5,463,614

OPTICAL RECORDING MEDIUM HAVING LARGE GUIDE GROOVE TRACK PITCH/MEANDER AMPLITUDE RATIO

Seiji Morita, Yokohama, Japan, assignor to Nikon Corporation, Tokyo, Japan

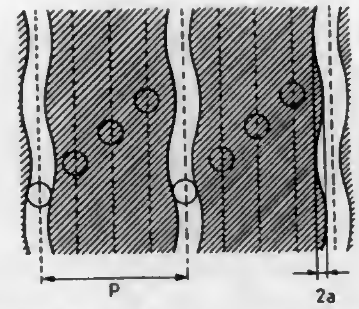
Filed Sep. 15, 1993, Ser. No. 121,254

Claims priority, application Japan, Sep. 21, 1992, 4-276604

Int. Cl.^{6} G11B *7/24;21/10*

U.S. Cl. 369—275.4 **18 Claims**

13. An information writable optical medium, including a plurality of tracks with meandering guide grooves, and wherein a ratio of track pitch/meander amplitude in an out-of-phase portion in which guide grooves meander out of phase on adjacent tracks has a sufficiently large value so as to substantially avoid reduction of signal amplitude due to influence between the adjacent tracks during signal reproduction from the guide grooves thereof.



5,463,615

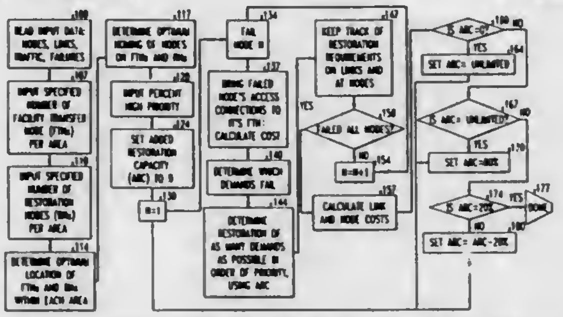
NODE FAILURE RESTORATION TOOL

Daniel Steinhorn, Holmdel, N.J., assignor to AT&T Corp., Murray Hill, N.J.

Filed Jul. 7, 1994, Ser. No. 271,931

Int. Cl.^{6} H04J *3/14;* **G06F** *11/00*

U.S. Cl. 370—16 **8 Claims**


READ INPUT DATA: NODES, LINKS, TRAFFIC, FAILURES
100
INPUT SPECIFIED NUMBER OF FACILITY TRANSFER NODE (FTNs) PER AREA
107
INPUT SPECIFIED NUMBER OF RESTORATION NODES (RNs) PER AREA
110
DETERMINE OPTIMUM LOCATION OF FTNs AND RNs WITHIN EACH AREA
114
DETERMINE OPTIMUM HOMING OF NODES ON FTNs AND RNs
117
INPUT PERCENT HIGH PRIORITY
120
SET ADDED RESTORATION CAPACITY (ARC) TO 0
124
N=1
130
FAIL NODE N
134
BRING FAILED NODE'S ACCESS CONNECTIONS TO IT'S FTN: CALCULATE COST
137
DETERMINE WHICH DEMANDS FAIL
140
DETERMINE RESTORATION OF AS MANY DEMANDS AS POSSIBLE IN ORDER OF PRIORITY, USING ARC
144
KEEP TRACK OF RESTORATION REQUIREMENTS ON LINKS AND AT NODES
147
FAILED ALL NODES?
150
YES
NO
N=N+1
154
CALCULATE LINK AND NODE COSTS
157
IS ARC=0?
160
NO
YES
SET ARC= UNLIMITED
164
IS ARC= UNLIMITED?
167
NO
YES
SET ARC=MAX
170
IS ARC=20%
174
YES
DONE
177
NO
SET ARC= ARC-20%
180

1. A node failure restoration method, comprising the steps of:

specifying a number of facility transfer nodes and restoration nodes within any area of a network node,

determining a given facility transfer node and a given restoration node to use in an area so that the total distance from the network node in the area to the given facility transfer node and given restoration node is minimized,

performing restoration in the event of a network node failure by bringing access traffic for the failed network node to the given facility transfer node and then from the given facility transfer node to the given restoration node,

bringing traffic from other network nodes which cross-connects with the access traffic to the failed network node's restoration node, and

determining the restoration paths so that a minimum number of restoration links are used.

5,463,616

METHOD AND APPARATUS FOR ESTABLISHING A FULL-DUPLEX, CONCURRENT, VOICE/NON-VOICE CONNECTION BETWEEN TWO SITES

Robert J. Kruse, Seattle; Harmon F. Law, Tacoma, and Steven R. Wagner, Kent, all of Wash., assignors to Advanced Protocol Systems, Inc., Seattle, Wash.

Continuation-in-part of Ser. No. 1,839, Jan. 7, 1993, abandoned. This application Jun. 21, 1994, Ser. No. 263,266

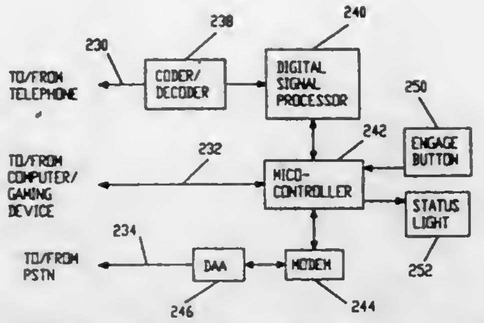
Int. Cl.^{6} H04J *3/00;* **H04L** *5/14;* **H04M** *11/06*

U.S. Cl. 370—24 **5 Claims**

1. A method for establishing a full-duplex, concurrent voice/non-voice data connection between a first site and a second site, comprising the steps of:

establishing voice-only communication between the two sites;

respectively detecting the pressing of an engage button at each site;



temporarily severing voice communication between the two sites in response to said detecting;

configuring a modem at each site, one modem entering an originate mode, the other modem entering a receive mode;

packaging non-voice data from a computing apparatus at the first site into a first non-voice data packet;

packaging voice data from a telephone at the first site into a first voice data packet;

transmitting the first non-voice data packet and first voice data packet from the first site to the second site;

receiving a communication signal at the first site;

determining at the first site whether the communication signal includes a second non-voice data packet or a second voice data packet;

when a second non-voice packet is included, extracting computer data from the second non-voice data packet for transmission to the computing apparatus;

when a second voice data packet is included routing the second voice data packet to a digital signal processor which extracts voice data for output to the telephone at the first site.

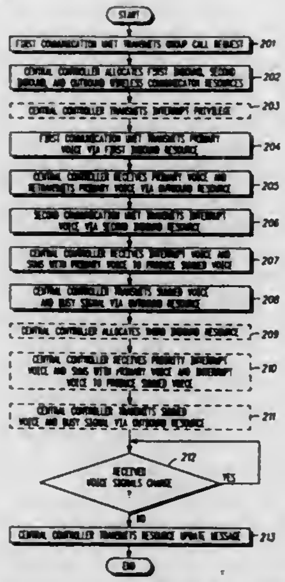
5,463,617

METHOD FOR PROVIDING CALLER INTERRUPT IN A TIME DIVISION MULTIPLEXED WIRELESS COMMUNICATION SYSTEM

Gary W. Grube, 157 Cedarwood Ct., Palatine, Ill. 60067; Brian K. Bunkenburg, 3416 N. Racine, Chicago, Ill. 60657, and Marc C. Naddell, 2904 Heatherwood Dr., Schaumburg, Ill. 60193

Filed Sep. 30, 1994, Ser. No. 316,666
Int. Cl.^{6} H04B ***7/14***

U.S. Cl. 370—29 **15 Claims**


START
FIRST COMMUNICATION UNIT TRANSMITS GROUP CALL REQUEST
201
CENTRAL CONTROLLER ALLOCATES FIRST INBOUND, SECOND INBOUND, AND OUTBOUND WIRELESS COMMUNICATION RESOURCES
202
CENTRAL CONTROLLER TRANSMITS INTERRUPT PRIVILEGE
203
FIRST COMMUNICATION UNIT TRANSMITS PRIMARY VOICE VIA FIRST INBOUND RESOURCE
204
CENTRAL CONTROLLER RECEIVES PRIMARY VOICE AND RETRANSMITS PRIMARY VOICE VIA OUTBOUND RESOURCE
205
SECOND COMMUNICATION UNIT TRANSMITS INTERRUPT VOICE VIA SECOND INBOUND RESOURCE
206
CENTRAL CONTROLLER RECEIVES INTERRUPT VOICE AND SUMS WITH PRIMARY VOICE TO PRODUCE SUMMED VOICE
207
CENTRAL CONTROLLER TRANSMITS SUMMED VOICE AND BUSY SIGNAL VIA OUTBOUND RESOURCE
208
CENTRAL CONTROLLER ALLOCATES THIRD INBOUND RESOURCE
209
CENTRAL CONTROLLER RECEIVES PRIORITY INTERRUPT VOICE AND SUMS WITH PRIMARY VOICE AND INTERRUPT VOICE TO PRODUCE SUMMED VOICE
210
CENTRAL CONTROLLER TRANSMITS SUMMED VOICE AND BUSY SIGNAL VIA OUTBOUND RESOURCE
211
212
RECEIVED VOICE SIGNALS CHANGE ?
YES
NO
CENTRAL CONTROLLER TRANSMITS RESOURCE UPDATE MESSAGE
213
END

1. In a TDM wireless communication system that includes a plurality of communication units arranged into at least one communication group, a plurality of wireless communication resources, and a central controller that allocates the plurality of wireless communication resources among the plurality of communication units, a method for providing caller interrupt, the method comprising the steps of:

a) transmitting, by a first communication unit of the at least one communication group, a request for a group call;

b) upon receiving the request, allocating, by the central controller, a first inbound wireless communication resource, a second inbound wireless communication resource, and an outbound wireless communication resource;

c) transmitting, by the first communication unit via the first inbound communication resource, primary voice signals:

d) receiving, by the central controller via the first inbound wireless communication resource, the primary voice signals;

e) retransmitting, by the central controller, the primary voice signals via the outbound wireless communication resource;

f) transmitting, by a second communication unit of the at least one communication group, interrupt voice signals on the second inbound wireless communication resource while the first communication unit is currently transmitting;

g) receiving, by the central controller via the second inbound wireless communication resource, the interrupt voice signals;

h) summing, by the central controller, the interrupt voice signals and the primary voice signals to produce summed voice signals; and

i) transmitting, by the central controller, the summed voice signals on the outbound wireless communication resource, thereby providing caller interrupt.

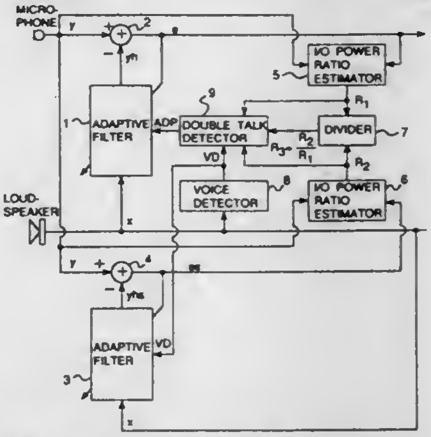
5,463,618

ECHO CANCELLER

Hiroki Furukawa; Junichi Tagawa, both of Osaka; Takeo Kanamori, Hirakata, and Satoru Ibaraki, Higashiosaka, all of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 26, 1994, Ser. No. 249,888
Claims priority, application Japan, May 28, 1993, 5-126883
Int. Cl.^{6} H04B ***3/23***

U.S. Cl. 370—32.1 **20 Claims**



1. An echo canceller which comprises:

a first adaptive filter for estimating an impulse response of an echo path between reception and transmission sides, holding the estimated impulse response as a first filter coefficient, and convoluting the first filter coefficient with a received input signal to thereby synthesize a first pseud echo;

a first subtracter for subtracting the first pseud echo synthesized by said first adaptive filter from a transmitting input signal to thereby cancel an echo contained in the transmitting input signal;

a second adaptive filter for estimating an impulse response of the echo path, holding the estimated impulse response as a second filter coefficient, and convoluting the received input signal with the second filter coefficient to thereby synthesize a second pseud echo;

- a second subtracter for subtracting the second pseud echo synthesized by said second adaptive filter from the transmitting input signal to thereby cancel the echo;
- a first input-output power ratio estimator which detects short time powers of input and output signals of said first subtracter to calculate a first I/O power ratio of an input-short-time-power/output-short-time-power of said first subtracter;
- a second input-output power ratio estimator which detects short time powers of input and output signals of said second subtracter to calculate a second I/O power ratio of an input-shot-time-power/output-short-time-power of said second subtracter;
- a divider for dividing the second I/O power ratio by the first I/O power ratio to calculate a third ratio;
- a voice detector for detecting a short time power of the received input signal to determine whether far-end speech is present or absent, wherein said voice detector controls said second adaptive filter to execute adaptation of said second adaptive filter for renewal of an impulse response of an echo path when far-end speech is present and otherwise to suspend the adaptation of said second adaptive filter when far-end speech is absent; and
- a double talk detector for controlling said first adaptive filter to execute or suspend adaptation of said first adaptive filter according to the determination results of said voice detector.

5,463,619

LOCAL COMMUNICATION BUS SYSTEM COMPRISING A SET OF INTERCONNECTED DEVICES, A CONTROL BUS, AND A SET OF SIGNAL INTERCONNECTIONS, AND A DEVICE AND A SWITCHBOX FOR USE IN SUCH SYSTEM

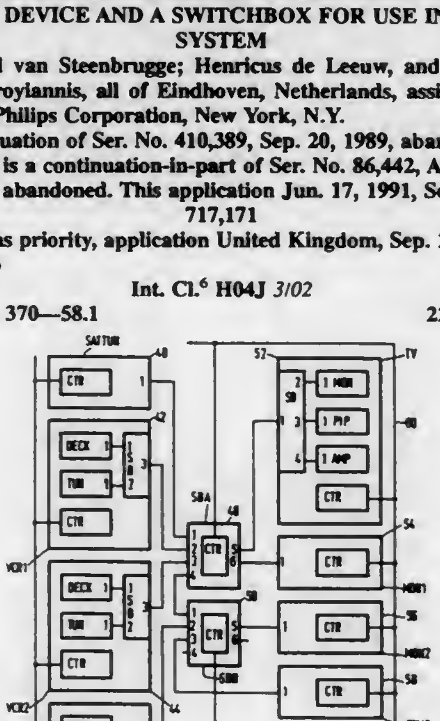
Bernard van Steenbrugge; Henricus de Leeuw, and Mihalis Mastroyiannis, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 410,389, Sep. 20, 1989, abandoned, which is a continuation-in-part of Ser. No. 86,442, Aug. 17, 1987, abandoned. This application Jun. 17, 1991, Ser. No. 717,171

Claims priority, application United Kingdom, Sep. 21, 1988, 8822193

Int. Cl.^{6} H04J *3/02*

U.S. Cl. 370—58.1 **22 Claims**



19. Apparatus, for use in a device in a local communication bus system, which system includes a plurality of devices connected via a serial bus, for establishing and specifying a signal path, which apparatus comprises:

a) interconnection table means for storing information indicating:

i) any other device pairwise interconnected to said device; and

ii) a respective pair of plugs for each said other device, said respective pair of plugs connecting said other device and said device, which pair of plugs comprises a first plug in said device and a second plug in said other device;

b) means for reading from the interconnection table means;

c) means responsive to the reading means for connecting to said other devices.

5,463,620

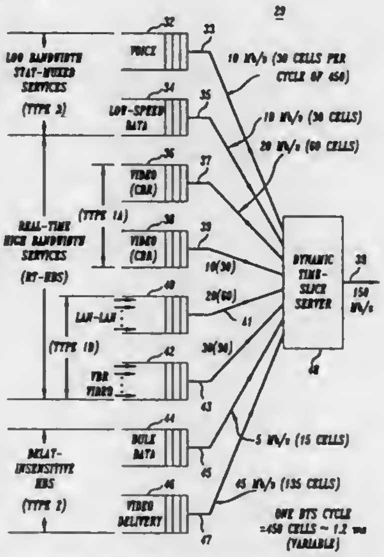
BANDWIDTH ALLOCATION, TRANSMISSION SCHEDULING, AND CONGESTION AVOIDANCE IN BROADBAND ASYNCHRONOUS TRANSFER MODE NETWORKS

Kotikalapudi Sriram, Matawan, N.J., assignor to AT&T IPM Corp., Coral Gables, Fla.

Continuation of Ser. No. 968,091, Oct. 29, 1992, abandoned. This application Feb. 22, 1994, Ser. No. 200,375

Int. Cl.^{6} H04J *3/22*

U.S. Cl. 370—60 **25 Claims**



1. A communications apparatus, comprising:

- a first queuing means for receiving information packets associated with low bandwidth calls;
- a second queuing means for receiving information packets associated with high bandwidth delay sensitive calls;
- a third queuing means for receiving information packets associated with high bandwidth delay insensitive calls;
- a multiplexing means for sequentially and cyclically drawing a predetermined number of information packets during successive service cycle time periods from each of the first, second, and third queuing means and combining those packets on a single output line; and
- a variable scheduling means, associated with the third queuing means, for providing a plurality of selectable scheduling schemes for completing the high bandwidth delay insensitive calls.

5,463,621

FAST CONNECTION SETUP INTERFACES USING PRE-ASSIGNED VIRTUAL CHANNEL IDENTIFIERS

Hiroshi Suzuki, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

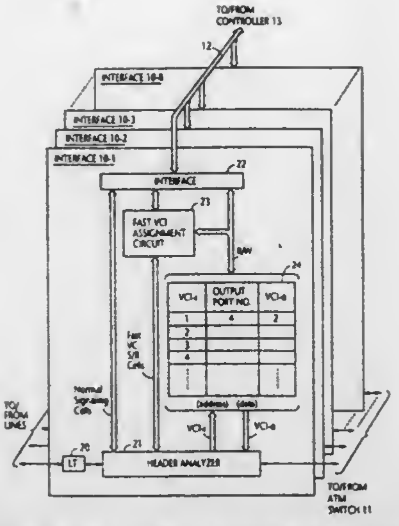
Filed May 27, 1994, Ser. No. 250,454

Claims priority, application Japan, May 27, 1993, 5-124549

Int. Cl.^{6} H04L *12/56*

U.S. Cl. 370—60 **7 Claims**

1. A switching system connected to a plurality of incoming lines and a plurality of outgoing lines, each of said outgoing lines being pre-assigned a unique set of virtual channel identifiers (VCI), the switching system comprising:



a plurality of interface means corresponding respectively to said incoming lines for receiving a signalling cell and a data cell from the corresponding incoming lines, each of the interface means comprising:

a memory for storing the VCIs pre-assigned to said outgoing lines;

a header translation table for defining relationships between a set of incoming VCIs and a corresponding set of outgoing VCIs;

means for assigning one of the stored VCIs to said signalling cell according to the destination of the signalling cell, updating said header translation table so that a connection is established between an incoming VCI and the assigned outgoing VCI, and assigning an outgoing VCI of the established connection to the data cell according to an incoming VCI contained in the data cell;

means for monitoring idle VCIs in the memory of each of said interface means;

means for increasing the number of outgoing VCIs stored in one of the memories of one of said interface means in which the number of the monitored idle VCIs becomes smaller than a predetermined value and decreasing the number of outgoing VCIs stored in the memory of the rest of said interface means in which the number of the monitored idle VCIs is not smaller than said predetermined value; and

self-routing switch means for routing any of said cells according to a VCI assigned thereto.

5,463,622

CONTROL UNIT FOR THE COMMON MEMORY OF AN ATM NODE

Hansjoerg Keller, Toffen; Sathyanarayana Rao, Bern, and Heinz-Christoph Schuerch, Wabern, all of, Switzerland, assignors to Ascom Tech AG, Bern, Switzerland

Filed Oct. 9, 1991, Ser. No. 768,677

Claims priority, application Switzerland, Mar. 2, 1990, 665/90

Int. Cl.^{6} H04L *12/56*

U.S. Cl. 370—60.1 **28 Claims**

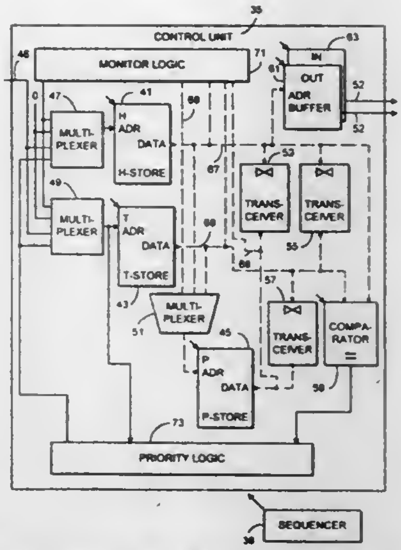
1. A control unit for the control of the common memory of an ATM-node,

said ATM-node is connected to a first plurality of incoming lines and to a second plurality of outgoing lines,

said ATM-node serves for the continuous reception and onward routing of address-labelled cells with uniform length and uniform construction, said cells arrive or leave over the incoming lines and the outgoing lines, respectively, and

said cells having a quantity of distinguishable priorities associated therewith,

said common memory serves for the intermediate storage of all said cells, which will be sent out on one of said outgoing lines,



said common memory has a third plurality of storage blocks, which are individually selectable by addresses and each of which services respectively for the reception of a said cell, said control unit comprising:

means for management and control and a sequencer for managing said storage blocks of said common memory and for controlling the sequential reading in and reading out of said cells, respectively, into or out of said storage blocks,

wherein said means for management and control comprises at least one addressable read/write store, a monitor logic, an input logic, a bus- and control-logic, and a comparator,

said read/write store comprising a total number of storage locations, said total number corresponding to said third plurality plus two times said second plurality multiplied by said quantity, plus 2;

wherein every said storage location of said read/write store is constructed for storing an address, twice of said second plurality of said storage locations multiplied by said quantity is associated in pairs with said outgoing lines, and

said third plurality of said storage locations is associated with said storage blocks of said common memory, and that two of said storage locations are associated with the empty ones of said storage blocks of said common memory.

5,463,623

INTEGRATED WIRELESS TELECOMMUNICATION AND LOCAL AREA NETWORK SYSTEM

Gary J. Grimes, Thornton, and Thomas M. Quinn, Boulder, both of Colo., assignors to AT&T IPM Corp., Coral Gables, Fla.

Filed Jul. 31, 1991, Ser. No. 738,415

The portion of the term of this patent subsequent to Dec. 22, 2010, has been disclaimed.

Int. Cl.^{6} H04L *12/28*

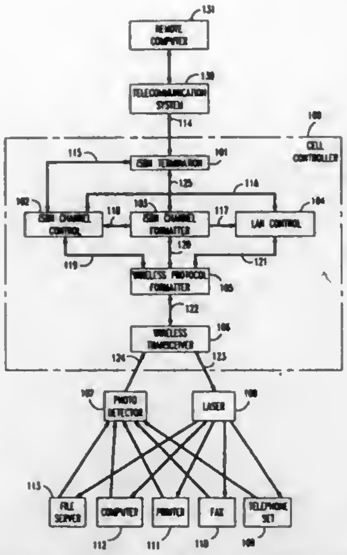
U.S. Cl. 370—79 **20 Claims**

1. An apparatus for simultaneously supporting communication among telecommunication units responsive to a telecommunication protocol and other units responsive to another protocol, comprising:

means in each of said telecommunication units for communicating telecommunication-protocol-defined data in a first portion of one of a plurality of frames communicated via a wireless medium;

means in each of said other units for communicating other-protocol-defined data in a second portion of said one of said plurality of frames;

means for determining first telecommunication-protocol-defined data and first other-protocol-defined data to be communicated with a telecommunication system;



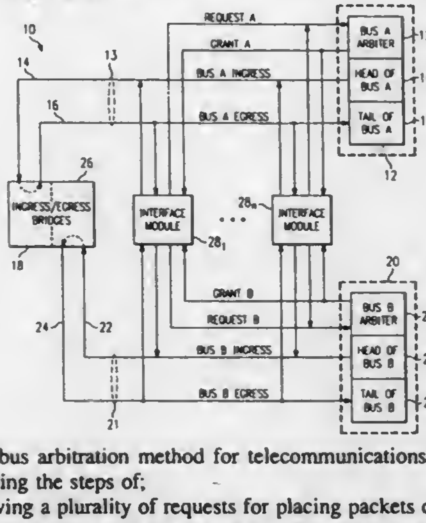
- means for converting said determined first other-protocol-defined data to telecommunication-protocol-defined data and the converted determined first other-protocol-defined data with said first telecommunication system;
- means for determining second telecommunication-protocol-defined data that is to be communicated directly to a one of the telecommunication units;
- means for directly communicating the determined second telecommunication-protocol-defined data to the one of the telecommunication units;
- means for determining second other-protocol-defined data that is to be communicated directly to a one of the other units; and
- means for directly communicating the determined second other-protocol-defined data to the one of the other units.

5,463,624

BUS ARBITRATION METHOD FOR TELECOMMUNICATIONS SWITCHING

Raymond L. Hogg, Carrollton, and Felix V. Diaz, Plano, both of Tex., assignors to DSC Communications Corporation, Plano, Tex.

Filed Apr. 15, 1994, Ser. No. 228,513
Int. Cl.^{6} H04L *12/403*
U.S. Cl. 370—85.6 21 Claims



1. A bus arbitration method for telecommunications switching, comprising the steps of;

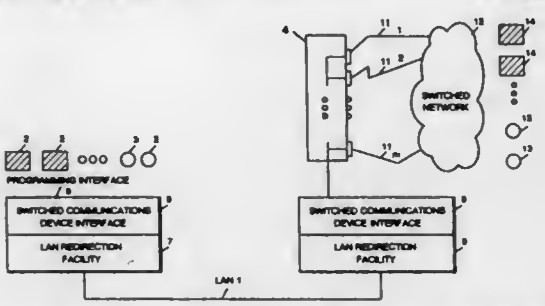
- receiving a plurality of requests for placing packets corresponding to the requests on an available idle asynchronous bus time slot, wherein each request has an associated weighted age indicating an amount of time the request has been pending and a priority of the request;
- ordering the plurality of requests according to the weighted age of each request; and
- granting access to the available asynchronous bus time slot to a request having a highest weighted age.

5,463,625

HIGH PERFORMANCE MACHINE FOR SWITCHED COMMUNICATIONS IN A HETEROGENEOUS DATA PROCESSING NETWORK GATEWAY

Mehrad Yasrebi, Scarborough, Canada, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 1, 1993, Ser. No. 131,059
Int. Cl.^{6} H04L *12/46*
U.S. Cl. 370—85.13 6 Claims



2. An interface mechanism for a switched communications gateway in a distributed computing network comprising:

- means for issuing multiple remote procedures calls between at least one computer and the gateway across the distributed network;
- means for concurrently processing the multiple remote procedure calls between said at least one computer and the gateway across the distributed network;
- means for identifying remote procedure calls for related functions;
- scheduling means for sequentially processing remote procedure calls for the related functions at the gateway; and
- means responsive to a remote procedure call for locating an idle switched port in the gateway and for binding the remote procedure call to the located port.

5,463,626

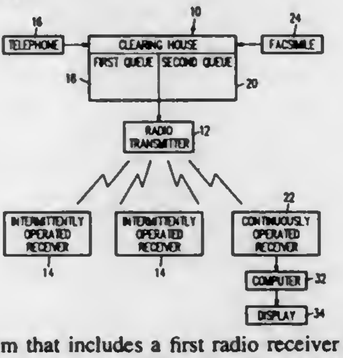
WIRELESS FACSIMILE COMPUTER SLATE

Don G. Hoff, Tiburon, Calif., and Lawrence H. Ragan, Richardson, Tex., assignors to Seiko Corp., and Seiko Epson Corp., Japan

Continuation of Ser. No. 979,743, Nov. 23, 1992, Pat. No. 5,337,314, which is a continuation of Ser. No. 515,810, Apr. 27, 1990, Pat. No. 5,166,932. This application Jul. 20, 1994, Ser. No. 277,732

The portion of the term of this patent subsequent to Aug. 9, 2011, has been disclaimed.

Int. Cl.^{6} H04Q *7/08;7/18*
U.S. Cl. 370—94.1 8 Claims



1. In a system that includes a first radio receiver and a second radio receiver, said first radio receiver having an associated first receiver address and said second radio receiver having an associated second receiver address, the combination of:

- radio transmission means for transmitting messages, each message having as a part thereof a receiver address, said messages including a first type message and a second type message, each of said second type of message being divided into a plurality of parts prior to transmission, each of said parts being transmitted together with the transmission of said second receiver address,
- said first receiver including means for intermittently activating said first receiver and for receiving first type messages transmitted by said transmission means which includes the first receiver address,
- said second receiver including means for continuously activating said second receiver means and for receiving portions of second type messages transmitted by said transmission means which include said second receiver address.

5,463,627

FRAME SYNCHRONIZING APPARATUS FOR QUADRATURE MODULATION DATA COMMUNICATION RADIO RECEIVER

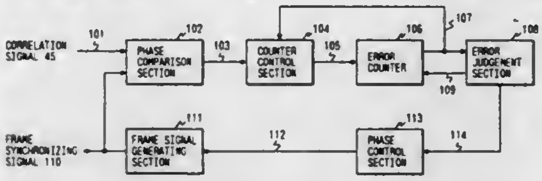
Akihiko Matsuoka; Hiroshi Ohnishi, both of Tokyo; Yoshinori Kunieda; Kouei Misaizu, both of Kawasaki, and Yuuri Yamamoto, Yokohama, all of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Feb. 23, 1994, Ser. No. 200,592

Claims priority, application Japan, Feb. 23, 1993, 5-33072; Feb. 26, 1993, 5-37641

Int. Cl.^{6} H04J *3/06*

U.S. Cl. 370—105.1 **9 Claims**



1. A frame synchronizing apparatus for a receiving apparatus of a digital data communications radio system in which data are transmitted as symbols in time-multiplexed frames each including a fixed symbol sequence, said frame synchronizing apparatus including a data correlation circuit for detecting occurrences of said fixed symbol sequence for thereby generating a correlation signal, and a frame synchronizing circuit comprising:

- frame synchronizing signal generating circuit means for generating a frame synchronizing signal;
- phase comparison means for executing successive phase comparison operations between said correlation signal and said frame synchronizing signal to produce corresponding phase detection values each selectively indicating that a detected phase error between said correlation signal and said frame synchronizing signal is positive, negative or zero;
- phase error counter means for deriving a cumulative count value indicative of a cumulative phase error between said frame synchronizing signal and correlation signal;
- counter control circuit means responsive to each of said phase detection values and said cumulative count value, when said detected phase error is indicated as zero and said cumulative phase error is indicated as other than zero, for decrementing the absolute value of said cumulative count value by a fixed amount following each said phase comparison operation; and
- error judgement and phase control circuit means coupled to control said frame synchronizing signal generating means, for adjusting the phase of said frame synchronizing signal in accordance with said cumulative count value.

5,463,628

DATA NETWORK INTERFACE

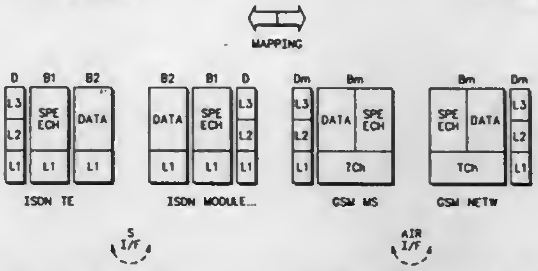
Lars S. Sorensen, Copenhagen, Denmark, assignor to Motorola, Schaumburg, Ill.

Filed Dec. 17, 1991, Ser. No. 808,825

Claims priority, application United Kingdom, May 12, 1990, 9010722; WIPO, May 6, 1991, EP91/00853

Int. Cl.^{6} H04J *3/12*

U.S. Cl. 370—110.1 **18 Claims**



1. An interface for communicating between a first system and a second system, the first system including a first traffic data channel and a first control channel, the second system including a second traffic data channel and a second control channel, said interface comprising:

- means for mapping control information between the first control channel and the second control channel;
- first means for mapping traffic data, in a first state of operation, between the first traffic data channel and the second traffic data channel under control of the control information on the first control channel and the second control channel; and
- second means for mapping traffic data, in a second state of operation, between the first control channel and the second traffic data channel under control of the control information on the first control channel.

5,463,629

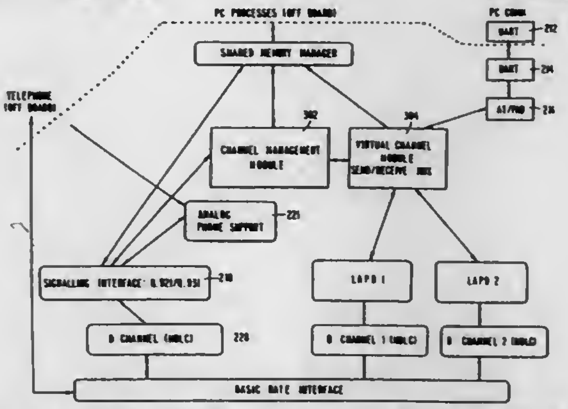
DYNAMIC CHANNEL ALLOCATION METHOD AND SYSTEM FOR INTEGRATED SERVICES DIGITAL NETWORK

Cheng-Hsu Ko, 5 Manor Pkwy., Salem, N.H. 03079

Continuation-in-part of Ser. No. 914,618, Jul. 17, 1992, abandoned, which is a continuation-in-part of Ser. No. 890,588, Jul. 13, 1992, abandoned. This application Nov. 18, 1992, Ser. No. 976,923

Int. Cl.^{6} H04J *3/12*

U.S. Cl. 370—110.1 **42 Claims**



1. In a computer interface to ISDN, a method of automatically allocating/deallocating B-Channels, comprising the steps of, above a LAPD protocol of layer 2:

- (a) monitoring events supplied to the ISDN which indicate requests to use or release a B-Channel;
- (b) evaluating channel usage priorities associated with events monitored in step (a);

(c) based upon said channel usage priorities, automatically setting up or tearing down circuit switched B-Channels associated with said ISDN; and

activating a virtual B-Channel between two compatible computer processes using a circuit switched B-Channel set up in step (c), and wherein step (c) includes the steps of logically adding or deleting circuit switched channels to or from said virtual B-Channel dynamically based on bandwidth requirements by the processes, and tearing down said virtual B-Channel based upon a condition predetermined by said computer processes.

5,463,630

METHOD OF CONVERTING A PARALLEL, TIME-DIVISION MULTIPLEXED DATA STREAM INTO INDIVIDUAL SERIAL DATA STREAMS AND VICE VERSA, AND CONVERTER THEREFOR

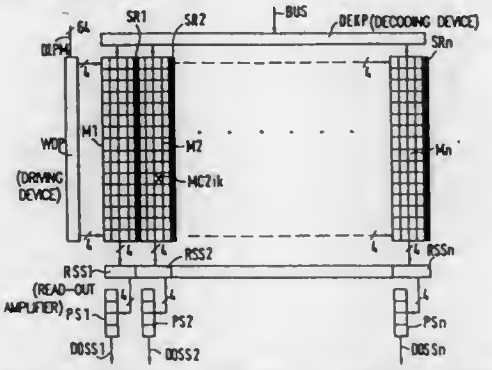
Michael Tooher, Ditzingen, Germany, assignor to Alcatel N.V., Rijswijk, Netherlands

Filed Jul. 12, 1994, Ser. No. 273,976

Claims priority, application Germany, Jul. 14, 1993, 43 23 521.2

Int. Cl.^{6} H04J *3/00*

U.S. Cl. 370—112 **10 Claims**



1. A method of converting a parallel, time-division-multiplexed data stream (DIPM) forming parallel data words, into individual serial data streams (DOSS1, DOSS2, . . . , DOSSn), wherein the individual parallel data words are written in parallel into and read serially from one of a plurality of buffers (M1, M2, . . . , or Mn), each buffer having a plurality of parallel inputs, characterized in that each parallel data word is presented simultaneously to the parallel inputs of all buffers (M1, M2, . . . , Mn), and that for each data word, the inputs of only one buffer are enabled.

5,463,631

ERROR PULSE WIDTH EXPANDING CIRCUIT

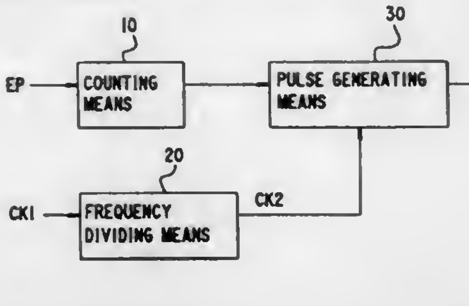
Shuji Yamamoto, Osaka, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 788,677, Nov. 6, 1991, abandoned. This application Jul. 11, 1994, Ser. No. 272,518

Claims priority, application Japan, Nov. 7, 1990, 2-303254

Int. Cl.^{6} G06F *11/00*

U.S. Cl. 371—5.1 **3 Claims**



1. An error pulse width expanding circuit for expanding, in time, a plurality of error pulses detected in the data of a frame and then outputting such error pulses, comprising:

a counting means for counting error pulses;

a frequency-dividing means for dividing the frequency of a reference clock pulse of data with a predetermined rate based on a maximum number of error pulses detected during one frame, such that said frequency-dividing means outputs a frequency-divided clock pulse corresponding to the maximum number of error pulses detected during the one frame; and

a pulse generating means, connected to the counting means and frequency-dividing means, for continuously outputting frequency-divided error clock pulses, as many as counted by said counting means.

5,463,632

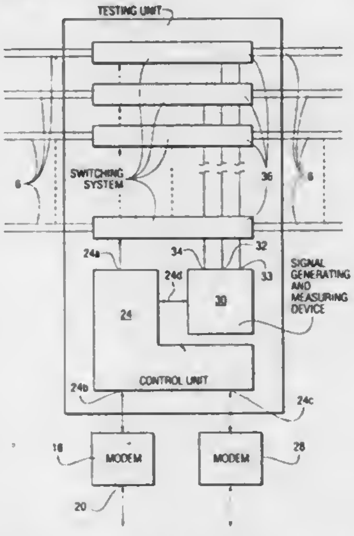
TESTING UNIT BY WHICH COMMUNICATION LINKS CAN BE SELECTED AND TESTED, AND METHOD THEREOF

Gilles Tremblay, Jonquière, Canada, assignor to Hydro-Quebec, Montreal, Canada

Continuation of Ser. No. 806,630, Dec. 13, 1991, abandoned. This application Jul. 26, 1994, Ser. No. 280,570

Int. Cl.^{6} G06F *11/00*

U.S. Cl. 371—20.1 **10 Claims**



1. A testing unit located at an intermediate station for selecting and testing communication links of a first communication system interconnecting a plurality of remote stations and the intermediate station by means of a second communication system interconnecting modems located at each of the remote stations, each of the modems at the remote stations communicating with a control module located at each of the remote stations, wherein each of the control modules are connected to one of the links of the first communication system, the testing unit comprising:

a) a first communication modem for transmitting first data signals and command signals over the second communication system between the testing unit and an operator at a remote location provided with a computer and a modem connected to the computer;

b) a second communication modem for transmitting second data signals and the command signals over the second communication system between the testing unit and any selected one of the remote stations, wherein, in operation, communication is established over the second communication system between the computer and the selected one of the remote stations via the first and second modems of the testing unit;

c) a switching system having a control input for receiving a switch control signal, a plurality of circuit banks each connected to a respective one of the communication links of the first communication system, and connection ports selectively connectable to one of the plurality of circuit banks in response to the switch control signal;

d) a signal generating and measuring device having input/output ports connected to the connection ports for sending a testing signal thereto and for receiving a resulting signal therefrom, and a control/data port for receiving a test control signal to control operation of the device and for producing a reading of the resulting signal received on one of the input/output ports of the device; and

e) a control unit for controlling operation of the switching system and of the signal generating and measuring device, and for remotely controlling operation of the control module of the selected one of the remote stations, the control unit having a first input/output port connected to the first modem for communication therewith, a second input/output port connected to the second modem for communication therewith, a control output connected to the control input of the switching system and a third input/output port connected to the control/data port of the signal generating and measuring device, wherein, in operation, the operator selects one of the communication links of the first communication system between the testing unit and the selected one of the remote stations by sending the command signals over the second communication system to the selected one of the remote stations via the first and second modems of the testing unit, and monitors a test procedure over the one communication link of the first communication system selected by the operator by means of the command signals sent over the second communication system from the computer to the control unit of the testing unit.

5,463,633

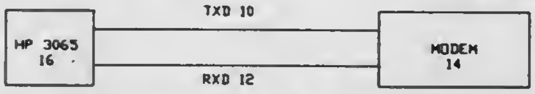
USE OF AT COMMANDS TO TEST MODEM WITH HP3065

Juan Lopez-Ramirez, El Paso, Tex., assignor to Rockwell International Corporation, Seal Beach, Calif.

Filed Feb. 22, 1994, Ser. No. 199,437

Int. Cl.^{6} G06F *11/00*

U.S. Cl. 371—20.3 **6 Claims**



1. A method for testing a modem, the method comprising:

(a) transmitting to the modem, in 1s and Os, binary representantions of "A", "T", and "<<Carriage returns>>", wherein:

  (1) each O transmission comprises a repeated cycle of:

    (A) placing a low voltage on a transmission line to the modem; and

    (B) checking for the low voltage on a receiving line from the modem;

  (2) each **1** transmission comprises a repeated cycle of:

    (A) placing a high voltage on the transmission line to the modem; and

    (B) checking for the high voltage on the receiving line from the modem; and

  (3) each transmission, whether of a **1** or of a **0**, takes place during a central half of a sampling interval dictated by the modem; and

(b) receiving from the modem, in 1s and Os, binary representantions of a group consisting of at least one character, wherein the acceptability of the group in response to the transmission is dictated by the modem, and wherein:

  (1) each **0** receipt comprises a repeated cycle of checking for the low voltage on the receiving line from the modem;

  (2) each **1** receipt comprises a repeated cycle of checking for the high voltage on the receiving line from the modem; and

  (3) each receipt, whether of a **1** or of a **0**, takes place during the central half of the sampling interval dictated by the modem.

5,463,634

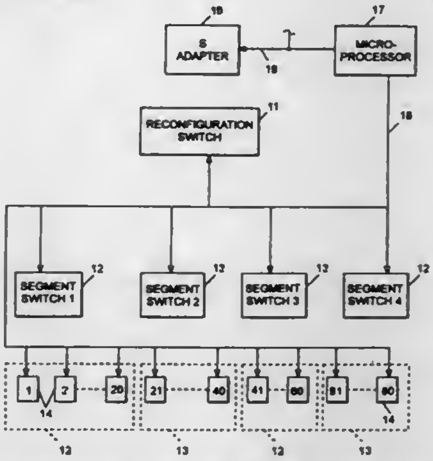
DUAL RING FAULT ISOLATION

Jay L. Smith; Bradley S. Trubey, both of Raleigh, and Anthony D. Walker, Durham, all of N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 812,773, Dec. 23, 1991, abandoned. This application Feb. 21, 1995, Ser. No. 391,303

Int. Cl.^{6} G06F *11/00*; H04J *1/16*

U.S. Cl. 371—20.6 **8 Claims**



1. In a unidirectional token ring network having a transmission media, a plurality of multiport reconfigurable access units coupled to the transmission media and a plurality of stations connected to each one of the plurality of multiport reconfigurable access units, a method for diagnosing said unidirectional token ring network to determine faulty components comprising:

configuring at least one of the multiport access units so that the unidirectional token ring is partitioned into a first unidirectional token ring network and an isolated unidirectional token ring network; said isolated unidirectional token ring network including a communication adapter coupled to a plurality of switch means, a programmed microprocessor coupled to the switch means and the adapter and selected ones of the plurality of stations coupled to selected ones of the plurality of switch means;

transmitting a unique message frame from said adapter to the selected ones of the plurality of stations;

disconnecting, by means of the microprocessor and selected switch means, one station at a time from the isolated unidirectional token ring network beginning with a station immediately upstream from said adapter and terminating disconnection step upon receipt at said adapter said unique message frame;

using the programmed microprocessor and tables internal to said programmed microprocessor to identify a fault domain which includes a last station, called the downstream station, removed before receiving said unique frame at the adapter and a station immediately upstream, called the upstream station, from the downstream station;

disconnecting all stations from the network;

reconnecting the downstream station;

testing the downstream station, if the downstream station fails, disabling the downstream station;

if the downstream station passes disconnecting the downstream station and reconnecting the upstream station;

testing the upstream station, if the upstream station fails, disabling the upstream station;

if the upstream station passes reconnecting both the downstream station and upstream station; and

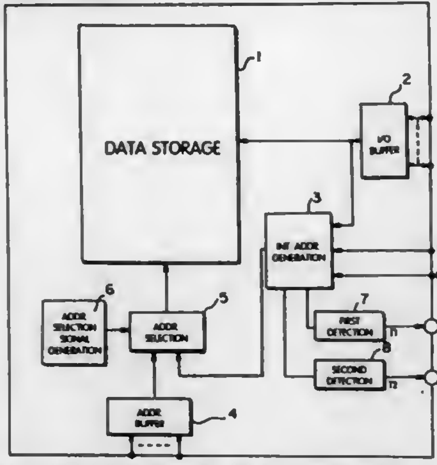
testing the upstream and downstream stations, if the upstream and downstream stations fails, disable both.

5,463,635

SEMICONDUCTOR MEMORY DEVICE INCLUDING MEANS FOR CHECKING THE OPERATION OF AN INTERNAL ADDRESS GENERATOR

Ryoichi Kumazawa, and Masaru Nawaki, both of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 711,544, Jun. 5, 1991, abandoned.
This application Apr. 28, 1994, Ser. No. 234,600
Claims priority, application Japan, Jun. 7, 1990, 2-150838
Int. Cl.^{6} G06F *11/00;11/30;* **G11C** *29/00*
U.S. Cl. 371—21.1 **17 Claims**



1. A semiconductor memory device, comprising:

a memory;

internal address means for providing internal addresses to the memory, said internal address means changing an internal counting value representing one of said internal addresses in response to a count signal, setting said internal counting value to an initial value in response to an initialization signal and outputting a signal representing the internal counting value, wherein each of said internal addresses is provided based on the internal counting value; and

detection means for judging whether said internal address means operates normally or not using a first predetermined counting value and a second predetermined counting value, said detection means including:

first detection means connected to the output of said internal address means, said first detection means detecting whether or not said output signal of said internal address means is said first predetermined counting value, and generating a first detection signal indicating a result of the detection, said first detection means including a plurality of MOS transistors which are connected in parallel, and a resistor; and

second detection means connected to the output of said internal address means, said second detection means detecting whether or not said output signal of said internal address means is said second predetermined counting value, and generating a second detection signal indicating a result of the detection, said second predetermined counting value being greater than said first predetermined counting value.

13. A semiconductor memory device, comprising:

a memory;

internal address means for providing internal addresses to the memory, said internal address means changing an internal counting value representing one of said internal addresses in response to a count signal, setting said internal counting value to an initial value in response to an initialization signal and outputting a signal representing the internal counting value, wherein each of said internal addresses is provided based on the internal counting value; and

detection means for judging whether said internal address means operates normally or not using a first predetermined counting value and a second predetermined counting value, said detection means including:

first detection means connected to the output of said internal address means, said first detection means detecting whether or not said output signal of said internal address means is said first predetermined counting value, and generating a first detection signal indicating a result of the detection;

second detection means connected to the output of said internal address means, said second detection means detecting whether or not said output signal of said internal address means is said second predetermined counting value, and generating a second detection signal indicating a result of the detection, said second predetermined counting value being greater than said first predetermined counting value;

memory means for storing said first detection signal; and

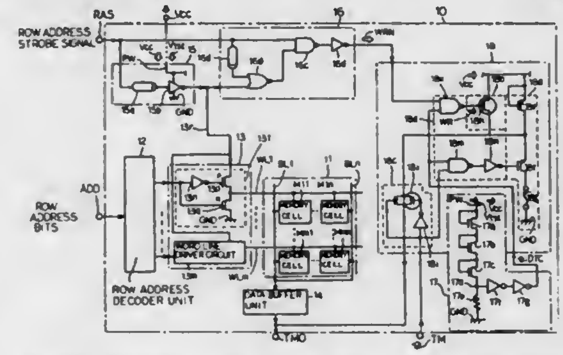
checking means to which an output signal of said memory means and said second detection signal are input, said checking means generating a checking signal indicating whether or not a level of said output signal of said memory means and a level of said second detection signal are both greater than a predetermined level.

5,463,636

SEMICONDUCTOR MEMORY DEVICE WITH BUILT-IN CONFIRMATION UNIT FOR ACCELERATING TEST

Hiroshi Nakayama, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed May 27, 1993, Ser. No. 67,980
Claims priority, application Japan, May 27, 1992, 4-134584
Int. Cl.^{6} G11C *29/00;8/00*
U.S. Cl. 395—183.01 **9 Claims**



1. A semiconductor memory device fabricated on a semiconductor chip and selectively entering a standard mode and a diagnostic mode of operation, comprising:

a) a memory cell array having a plurality of addressable memory cells for storing data information;

b) a data transferring system selectively coupled with said plurality of addressable memory cells, and operative to relay data information between said memory cell array and a data port in said standard mode of operation;

c) power distributing means for receiving a predetermined voltage level and a test voltage level, and having a power distributing circuit responsive to an external control signal for selectively supplying said predetermined voltage level in said standard mode and said test voltage level in an accelerating test of said diagnostic mode to a power supply line at a predetermined timing;

d) an addressing system having a plurality of word lines selectively coupled with said plurality of addressable memory cells and a word line driving unit coupled with said power supply line for selectively driving said plurality of word lines to said predetermined voltage level in said standard mode and to said test voltage level, larger in magnitude than said predetermined voltage level, in said accelerating test operation, said plurality of memory cells being selectively driven by said plurality of word lines; and

e) a diagnostic system having a first monitoring unit operative to monitor said power supply line to see whether or not said test voltage level is supplied to said addressing system in said accelerating test for producing a warning signal indicative of an accelerating test without said test voltage level, a second monitoring unit operative to monitor said power distributing means to see whether or not said test voltage level is supplied to said power distributing means in said accelerating test for producing a detecting signal indicative of said test voltage level, and a non-volatile memory means enabled with said detecting signal and operative to store said warning signal.

5,463,637

APPARATUS AND METHOD FOR TESTING A BUFFER MEMORY DEVICE WHICH CHECKS WHETHER DATA IS VALID OR INVALID

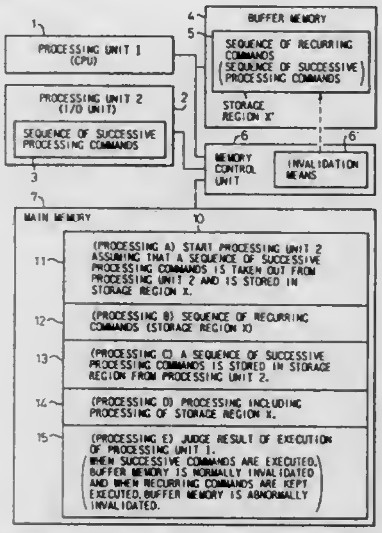
Ryotaro Hayashi, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 28, 1993, Ser. No. 174,015

Claims priority, application Japan, Dec. 28, 1992, 4-348586

Int. Cl.^{6} G11C *29/00*

U.S. Cl. 371—21.1 **16 Claims**


1
PROCESSING UNIT 1 (CPU)
PROCESSING UNIT 2 (I/O UNIT)
2
SEQUENCE OF SUCCESSIVE PROCESSING COMMANDS
3
4
BUFFER MEMORY
5
SEQUENCE OF RECURRING COMMANDS (SEQUENCE OF SUCCESSIVE PROCESSING COMMANDS)
STORAGE REGION X'
6
6'
MEMORY CONTROL UNIT
INVALIDATION MEANS
7
MAIN MEMORY
10
11
(PROCESSING A) START PROCESSING UNIT 2 ASSUMING THAT A SEQUENCE OF SUCCESSIVE PROCESSING COMMANDS IS TAKEN OUT FROM PROCESSING UNIT 2 AND IS STORED IN STORAGE REGION X.
12
(PROCESSING B) SEQUENCE OF RECURRING COMMANDS (STORAGE REGION X)
13
(PROCESSING C) A SEQUENCE OF SUCCESSIVE PROCESSING COMMANDS IS STORED IN STORAGE REGION FROM PROCESSING UNIT 2.
14
(PROCESSING D) PROCESSING INCLUDING PROCESSING OF STORAGE REGION X.
15
(PROCESSING E) JUDGE RESULT OF EXECUTION OF PROCESSING UNIT 1.
(WHEN SUCCESSIVE COMMANDS ARE EXECUTED, BUFFER MEMORY IS NORMALLY INVALIDATED AND WHEN RECURRING COMMANDS ARE KEPT EXECUTED, BUFFER MEMORY IS ABNORMALLY INVALIDATED.)

13. An apparatus for testing a buffer memory device, comprising:

a main memory storing predetermined operational processing data;

a buffer memory for storing a copy of said predetermined operational processing data stored in said main memory;

processing units, including first and second processing units, accessing at least one of said main memory and said buffer memory;

invalidation means for rewriting said operational processing data in said main memory into different operational processing data when at least one processing is operated, and for invalidating said operational processing data stored in said buffer memory when said operational processing data stored in said buffer memory are different from said operational processing data stored in said main memory; and

means, stored in said main memory, for testing said buffer memory device, said testing means comprising:

means for storing a separately provided first command sequence in a data storage region of said main memory, and storing said first command sequence in a data storage region of said buffer memory in response to an instruction from said first processing unit,

means for storing a separately provided second command sequence different from said first command sequence in said data storage region of said main memory in place of said first command sequence in response to an instruction from one of said first and second processing units,

means for invalidating the first command sequence stored in the data storage region of said buffer memory, when said second command sequence is substituted for said first command sequence in said data storage region of said main memory, and

means for determining that the invalidation processing is correctly executed when said first processing unit is executing said second command sequence after said invalidation processing has been executed, and for determining that said invalidation processing is not correctly executed when said first processing unit is executing said first command sequence.

5,463,638

CONTROL DEVICE FOR INTERFACE CONTROL BETWEEN A TEST MACHINE AND MULTI-CHANNEL ELECTRONIC CIRCUITRY, IN PARTICULAR ACCORDING TO BOUNDARY TEST STANDARD

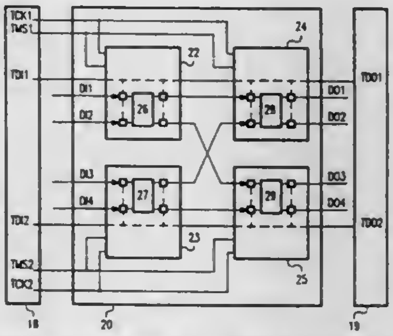
Willem J. De Lange, Waalre, Netherlands, assignor to JTAG Technologies B.V., Eindhoven, Netherlands

Filed Apr. 13, 1993, Ser. No. 46,832

Claims priority, application European Pat. Off., May 11, 1992, 92201332.1

Int. Cl.^{6} H04B *17/00*

U.S. Cl. 371—22.3 **13 Claims**



1. A control device for interface control between a test machine and electronic circuitry at a multi-channel width, said device having foreground pattern presentation means for presenting foreground test data strings at a first multi-bit width, said device being characterized by comprising:

background data presentation means for presenting background data at a second multi-bit width;

indicator means for storing indicator data discriminating between foreground data and background data in a composite test pattern to be applied to said multi-channel width;

composition means for repeatedly activating said foreground pattern presentation means and background data presentation means under control of said indicator means for thereby providing said foreground and background data at said first and second multi-bit widths, respectively;

positioning means for receiving compacted foreground test data and under control of said indicator data positioning foreground data and background data to mutually exclusive bit positions; and

output means fed by said positioning means to output composite test data at said multi-channel width.

5,463,639

AUTOMATIC PATTERN SYNCHRONIZING CIRCUIT OF AN ERROR DETECTOR

Tetsuya Koishi; Noboru Akiyama, and Yasuto Kumai, all of Tokyo, Japan, assignors to Advantest Corporation, Tokyo, Japan

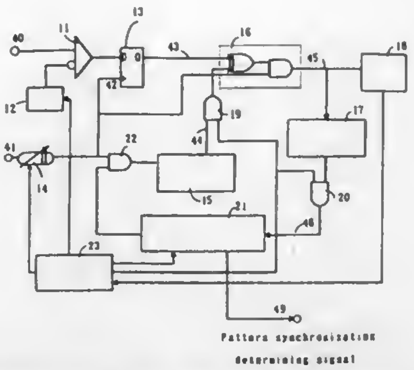
Filed Apr. 28, 1994, Ser. No. 234,043

Claims priority, application Japan, Apr. 28, 1993, 5-027918 U; Sep. 28, 1993, 5-057148 U

Int. Cl.^{6} G01R *31/28*

U.S. Cl. 371—27.004 **7 Claims**

1. An automatic pattern synchronizing circuit of an error detector comprising:



- a comparator which receives an input signal pattern to compare with a reference voltage;
- a reference voltage generator for providing said reference voltage to said comparator;
- a variable delay element for providing a delay time to a clock signal;
- a re-timing circuit which receives an output signal of said comparator to synchronize with said clock signal supplied through said variable delay element;
- an error counter which receives output pulses of said re-timing circuit and counts a number of said pulses per unit time with respect to said reference voltage;
- a gate circuit which inhibits a reference signal pattern from being provided to said error counter;
- a controlling part for controlling said reference voltage generator and said variable delay element in response to said counted pulses per unit time by said error counter.

5,463,640

DEVICE AND METHOD FOR DECODING A STREAM OF DATA SYMBOLS WHICH ARE INTERLEAVED AND SUBJECT TO A DISCONTINUITY THEREOF INVOLVING LABELLING THOSE DATA SYMBOLS WHICH ARE SUSPECT AS A RESULT OF THE DISCONTINUITY

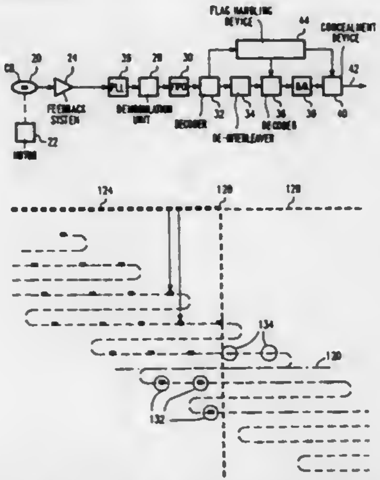
Henri Cloetens, Leuven, Belgium, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 16, 1993, Ser. No. 78,790

Claims priority, application European Pat. Off., Jul. 7, 1992, 92202056

Int. Cl.^{6} G06F ***11/10***

U.S. Cl. 371—37.1 **20 Claims**



1. A decoding device for decoding a stream of data symbols representing a user signal, the data symbols being organized according to a systematic interleaving mechanism among the data symbols so as to have an interleaved pattern, the device comprising:

- de-interleaving means for de-interleaving the stream of data symbols so that the data symbols have an de-interleaved pattern which is in temporal conformity with the user signal;
- detector means for detecting a discontinuity of the stream of data symbols prior to de-interleaving;
- labelling means for labelling certain of the data symbols suspect on the basis of a comparison between where the discontinuity appears with respect to the data symbols in both the interleaved pattern and the de-interleaved pattern which enables a determination as to which data symbols occur before the discontinuity and which data symbols occur after the discontinuity when the data symbols are in the interleaved pattern and when the data symbols are in the de-interleaved pattern; and
- remedial means for executing a remedial operation in reconstructing the user signal from the stream of data symbols subsequent to de-interleaving on the basis of the data symbols which are labelled suspect;
- wherein the data symbols which are labelled suspect are the data symbols which (a) occur prior to the discontinuity when the data symbols are in the interleaved pattern but after the discontinuity when the data symbols are in the de-interleaved pattern, and (b) occur after the discontinuity when the data symbols are in the interleaved pattern but prior to the discontinuity when the data symbols are in the de-interleaved pattern.

5,463,641

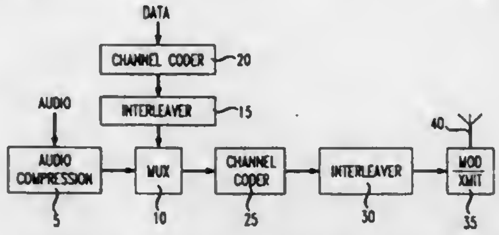
TAILORED ERROR PROTECTION

Sean M. Dorward, Somerville; Nuggehally S. Jayant, Gillette; James D. Johnston, Warren; Schuyler R. Quackenbush, Westfield; Nambirajan Seshadri, and Carl-Erik W. Sundberg, both of Chatham, all of N.J., assignors to AT&T IPM Corp., Coral Gables, Fla.

Filed Jul. 16, 1993, Ser. No. 92,623

Int. Cl.^{6} H03M ***13/00***

U.S. Cl. 371—374 **18 Claims**



1. A method for encoding a first signal and a second signal to provide error protection for the signals, the first signal requiring greater error protection than the second signal, the first and second signals for use in communication with a receiver, the receiver for producing decoded first and second signals corresponding to the first and second Signals, respectively, the method comprising the steps of:

- a. encoding the first signal with a first error protection code;
- b. combining the encoded first signal with the second signal; and
- c. encoding a combination of the encoded first signal and the second signal with a second error protection code to generate a combined error protected signal for use in transmission to the receiver, wherein the first signal is coded with both the first and second error protection codes;

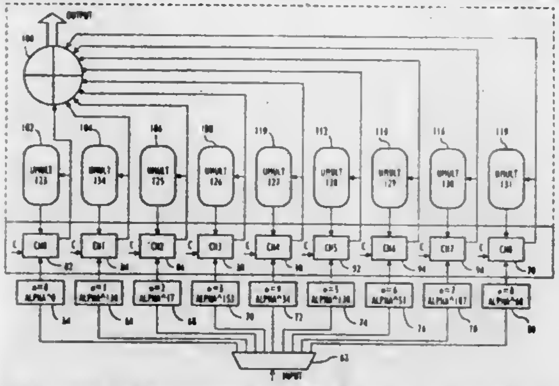
wherein said first signal is such that the decoded first signal, when irreparably corrupted due to transmission of said combined error protected signal, will not affect correct processing of the decoded second signal by the receiver.

5,463,642

METHOD AND APPARATUS FOR DETERMINING ERROR LOCATION

Vickie L. Gibbs, and Rom-Shen Kao, both of Durham, N.C., assignors to Mitsubishi Semiconductor America, Inc., Durham, N.C.

Filed Jun. 29, 1993, Ser. No. 82,867
Int. Cl.^{6} H03M *13/00*
U.S. Cl. 371—40.1 **15 Claims**



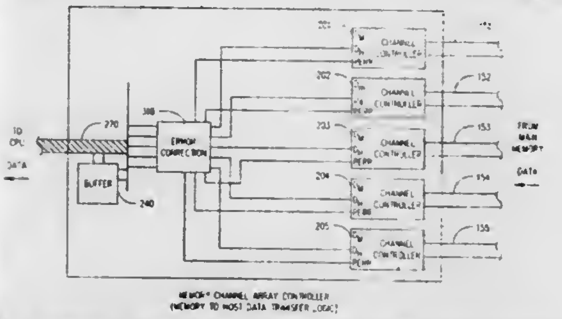
1. A circuit for determining locations of errors in an optical disk memory means comprising:
an input register for introducing a plurality of component signals representing possible positions of the errors, and
a checking circuit for analyzing the plurality of component signals to find locations of the errors,
said checking circuit comprising a plurality of circuits for multiplying each of the component signals by a respective element of a set of Galois field elements, said plurality of circuits consisting of multipliers by Galois field elements α^{123}–α^{131} to reduce the number of XOR gates used in said plurality of circuits for multiplying.

5,463,643

REDUNDANT MEMORY CHANNEL ARRAY CONFIGURATION WITH DATA STRIPING AND ERROR CORRECTION CAPABILITIES

Darius D. Gaskins, Austin, and Terry J. Parks, Round Rock, both of Tex., assignors to Dell USA, L.P., Austin, Tex.

Filed Mar. 7, 1994, Ser. No. 207,009
Int. Cl.^{6} H03M *13/00;* **G06F** *11/00*
U.S. Cl. 371—40.1 **11 Claims**



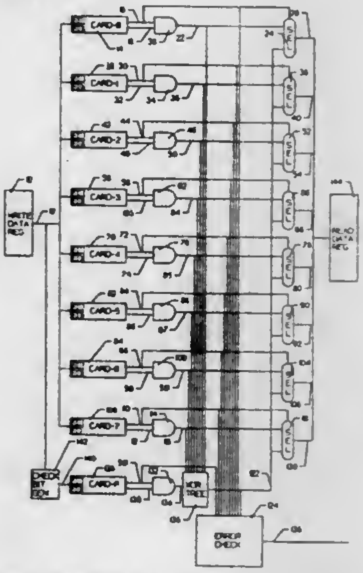
1. A memory channel array system providing error correction capabilities, comprising:
a main memory;
a memory channel array controller; and
a first plurality of channels coupled between said memory channel array controller and said memory for transferring data between said memory channel array controller and said memory, said first plurality of channels including at least one redundant channel;
wherein said memory channel array controller includes:
a first plurality of channel controllers corresponding to said first plurality of channels, each of said first plurality of channel controllers being coupled to a corresponding one of said first plurality of channels, wherein each of said first plurality of channel controllers generates a signal indicative of incorrect data transferred on said corresponding channel; and
error correction logic coupled to said first plurality of channel controllers which receives data from each of said channel controllers and said incorrect data indicating signals from said channel controllers and outputs corrected data if one of said incorrect data indicating signals indicates incorrect data.

5,463,644

RESILIENT STORAGE SYSTEM

EuGene A. Rodi, Minneapolis, and Ferris T. Price, deceased, late of Mayer, both of Minn., assignors to Unisys Corporation, Blue Bell, Pa.

Filed Nov. 13, 1992, Ser. No. 975,381
Int. Cl.^{6} G06F *11/10*
U.S. Cl. 371—40.4 **8 Claims**



1. A memory apparatus for reading and writing a data word comprising:
a. a plurality of memory array means wherein each of said plurality of memory array means stores a corresponding portion of the data word; each of said plurality of memory array means including an error detection means and an error correction means; said error correction means being for correcting single bit errors in said corresponding portion of the data word thereby providing a corresponding corrected data element; each of said plurality of memory array means being capable of detecting multiple bit errors in said corresponding portion of the data word and asserting a multiple bit error detection line if a multiple bit error is detected;
b. a plurality of control means wherein each of said plurality of control means is coupled to a corresponding one of said plurality of memory array means; said plurality of control means receiving a corresponding corrected data element and further receiving a corresponding multiple bit error detection line;
c. a plurality of selection means wherein each of said plurality of selection means is coupled to a corresponding one of said plurality of control means and is further coupled to a corresponding one of said plurality of memory array means; each of said plurality of selection means receiving a corresponding corrected data element and further receiving a corresponding multiple bit error detection line;
each of said plurality of control means providing said corresponding corrected data element to said corresponding one of said plurality of selection means when said corresponding multiple bit error detection line is not asserted; each of said

plurality of control means providing a predetermined logic level to said corresponding one of said plurality of selection means when said corresponding multiple bit error detection line is asserted;

d. a check bit generator means coupled to the data word for generating a plurality of error correction check bits;

e. a redundant memory array means for storing said plurality of error correction check bits; said redundant memory array means including an error detection means and an error correction means; said error correction means for correcting single bit errors in a corresponding portion of said plurality of error correction check bits thereby providing a corresponding corrected check bit element;

f. a redundant control means coupled to said redundant memory array means; said redundant control means receiving said corresponding corrected check bit element and further receiving a corresponding multiple bit error detection line from said redundant memory array means; said redundant control means providing said corrected check bit element when said corresponding multiple bit error detection line is not asserted; said redundant control means providing a predetermined logic level when said corresponding multiple bit error detection line is asserted; and

g. an error correction means coupled to said plurality of control means, to said redundant control means, and to said plurality of selection means; said error correction means providing a system level corrected portion of the data word to said plurality of selection means; a corresponding one of said plurality of selection means selecting said system level corrected portion of the data word if said corresponding multiple bit error detection line is asserted and selecting said corresponding corrected data element if said corresponding multiple bit error detection line is not asserted.

5,463,645

SYSTEM FOR DETECTING NON-COINCIDENCE OF CODES

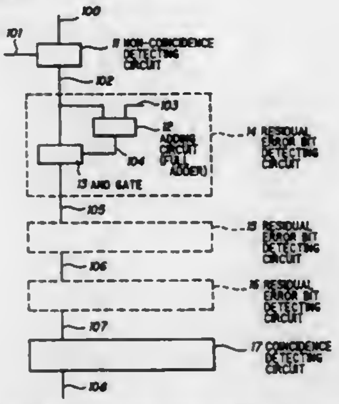
Noriaki Nagashima, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jun. 21, 1993, Ser. No. 80,083

Claims priority, application Japan, Jun. 19, 1992, 4-161489

Int. Cl.⁶ H04L *7/10*

U.S. Cl. 371—67.1 **5 Claims**


100
101
11 NON-COINCIDENCE DETECTING CIRCUIT
102
103
12 ADDING CIRCUIT (FULL ADDER)
104
13 AND GATE
14 RESIDUAL ERROR BIT DETECTING CIRCUIT
105
15 RESIDUAL ERROR BIT DETECTING CIRCUIT
106
16 RESIDUAL ERROR BIT DETECTING CIRCUIT
107
17 COINCIDENCE DETECTING CIRCUIT
108

1. A system for detecting non-coincidence of codes, comprising:

means for comparing an input coded signal and a predetermined coded signal to generate a non-coincidence signal including correct and error bits;

means for changing said error bits to correct bits in said non-coincidence signal by a predetermined number of bits, thereby generating an error bit decreased signal; and

means for detecting non-coincidence between said input coded signal and said predetermined coded signal by checking for an existence of an error bit in said error bit decreased signal.

5,463,646

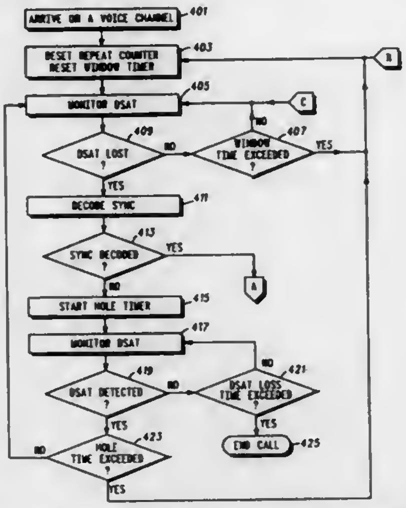
METHOD FOR ERROR CORRECTION OF A TRANSMITTED DATA WORD

Thomas M. Dillon, Chicago; Robert K. Krolopp, Lisle, and Michael P. Metroka, Algonquin, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Division of Ser. No. 704,508, May 23, 1991, Pat. No. 5,241,548. This application Jan. 7, 1993, Ser. No. 1,685

Int. Cl.⁶ H04L *1/08*

U.S. Cl. 371—69.1 **2 Claims**



1. A method for prevention of inappropriate use of a majority vote scheme in a radio frequency (RF) communication system comprising a plurality of communication devices, a number of a plurality of messages being transmitted within the RF communication system, at least one communication device having a message repeat counter and a message window timer for determining a window time, the method comprised of the steps of:

a) starting the window-timer upon receiving a first message; and

b) if the number of the plurality of messages are not received during the window time, resetting the message repeat counter and window timer.

5,463,647

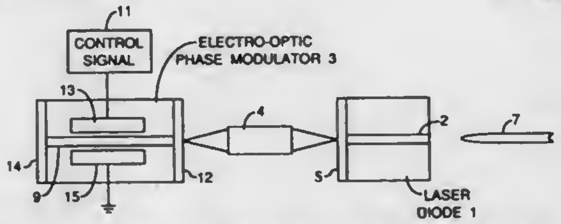
BROADBAND MULTI-WAVELENGTH NARROW LINEWIDTH LASER SOURCE USING AN ELECTRO-OPTIC MODULATOR

Jing-Jong Pan, Milpitas, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Continuation of Ser. No. 29,315, Feb. 25, 1993, abandoned. This application Oct. 14, 1994, Ser. No. 324,275

Int. Cl.⁶ H01S *3/11*

U.S. Cl. 372—12 **11 Claims**



1. A tunable laser source apparatus enabling a laser diode to be pumped to lase in an extra-cavity environment having no external reflectors and thus consisting essentially of:

(a) an optical phase modulator optically coupled to said laser diode; and

(b) tuning control means for shifting the phase of a light wave modulated by the optical phase modulator such that a resonant frequency of said light wave is shifted.

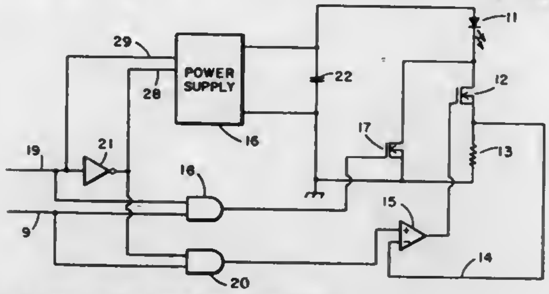
5,463,648

PULSE FORMING NETWORK FOR DIODE LASER

David M. Gibbs, Apopka, Fla., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed Aug. 1, 1994, Ser. No. 283,542
Int. Cl.^{6} H01S *3/00*

U.S. Cl. 372—38 **14 Claims**



1. A laser diode apparatus comprising:

a laser diode;

a two level power supply having a heat mode signal input and being coupled to said laser diode for operating said laser diode at superthreshold in one level of operation and at a subthreshold in a second level of operation responsive to heat mode signals applied to said heat mode signal input; and

a pulse forming network for generating current pulses in said laser diode, said pulse forming network being coupled to said two level power supply and to said laser diode for actuating said laser diode in a subthreshold mode of operation for heating said diode junction without producing light and in a superthreshold mode of operation for producing light, whereby a laser diode has improved temperature stabilization and shortened turn on time by switching from a subthreshold mode to a super threshold mode.

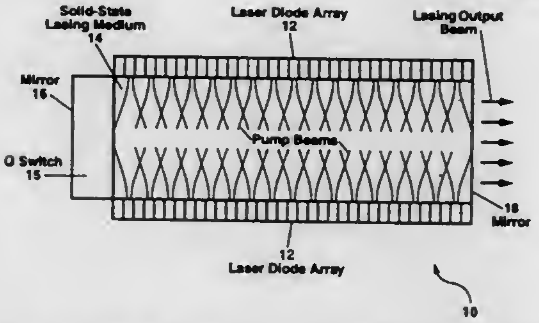
5,463,649

MONOLITHICALLY INTEGRATED SOLID STATE LASER AND WAVEGUIDE USING SPIN-ON GLASS

Carol I. H. Ashby, Edgewood; John P. Hohimer, Albuquerque; Daniel R. Neal, Tijeras, and G. Allen Vawter, Albuquerque, all of N.M., assignors to Sandia Corporation, Albuquerque, N.M.

Filed Aug. 6, 1993, Ser. No. 102,907
Int. Cl.^{6} H01S *3/06;3/0941;3/17*

U.S. Cl. 372—40 **6 Claims**



1. A monolithically integrated solid state optical circuit formed on a semiconductor substrate comprising:

at least one excitation pump source of light formed on the semiconductor substrate;

an optical waveguide means on the substrate comprising spun-on glass formed adjacent to and optically coupled to the at least one source of excitation pump light wherein the waveguide means includes a portion containing a dopant material which exhibits optical gain in response to the absorption of radiation from the at least one excitation pump source of light; and

output means optically connected to the waveguide means.

5,463,650

APPARATUS FOR CONTROLLING OUTPUT OF AN EXCIMER LASER DEVICE

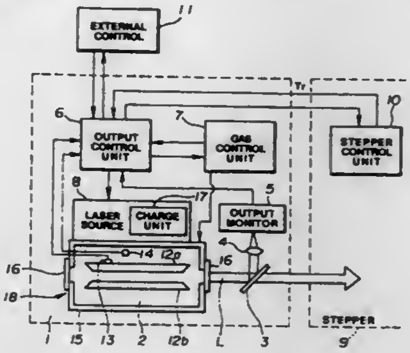
Noritoshi Ito; Yoshiho Amada, and Osamu Wakabayashi, all of Hiratsuka, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Continuation of Ser. No. 92,254, Jul. 15, 1993, abandoned. This application Dec. 28, 1994, Ser. No. 365,323

Claims priority, application Japan, Jul. 17, 1992, 4-191056; Sep. 14, 1992, 4-245239; Jan. 19, 1992, 4-280250; Nov. 30, 1992, 4-320566

Int. Cl.^{6} H01S *3/22*

U.S. Cl. 372—57 **35 Claims**



1. An apparatus for controlling output of an excimer laser

trigger signal generating means for generating a trigger signal which causes pulse oscillation of a laser beam to occur in such a manner that an operation of oscillating a predetermined number of successive laser beam pulses and suspending the pulse oscillation for a predetermined time subsequent to the successive laser beam pulse oscillation is repeated;

output control means for generating discharge voltage data for causing energy of each of the pulses to have a desired value according to the trigger signal outputted from the trigger signal generating means;

laser power supply means for supplying a voltage having a value in accordance with the discharge voltage data outputted from the output controlling means across discharge electrodes disposed in a laser chamber so as to cause electric discharge to occur; and

oscillation means for exciting a laser gas filled in the laser chamber by the electric discharge so as to oscillate the laser beam,

wherein the apparatus further comprises time measuring means for measuring a receiving interval of the trigger signal outputted from the trigger signal generating means as a suspension period of the pulse oscillation,

wherein the output control means generates the discharge voltage data such that when the suspension period of the pulse oscillation measured by the time measuring means exceeds a predetermined threshold value, the discharge voltage data is varied so that a discharge voltage corresponding to a pulse in a next successive pulse oscillation subsequent to the suspension of the successive pulse oscillation gradually increases as the pulse oscillates later in the next pulse oscillation and a degree of the varying of the discharge voltage data corresponding to each pulse in the next successive pulse oscillation subsequent to the suspension of the successive pulse oscillation increases as the suspension period measured by the time measuring means increases, and

wherein the laser power supply means supplies a voltage having a value in accordance with the discharge voltage data outputted from the output control means across the discharge electrodes disposed in the laser chamber so as to cause electric discharge to occur, whereby energy of each pulse in the next successive pulse oscillation is equal to a same desired value.

5,463,651

LASER BEAM GENERATOR

Yuichi Komachi, Tokyo, and Moriaki Wakaki, Kanagawa, both of, Japan, assignors to Kabushiki Kaisha Machida Seisakusho, Tokyo, Japan

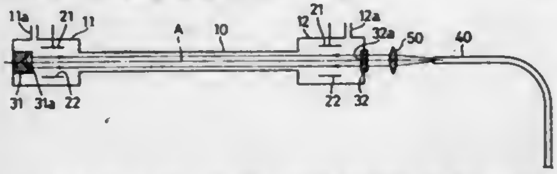
Filed Jan. 28, 1993, Ser. No. 10,309

Claims priority, application Japan, Feb. 7, 1992, 4-056948

Int. Cl.⁶ H01S ***3/08***

U.S. Cl. 372—92 **4 Claims**

1. A laser beam generator, comprising:



(a) a first mirror and a second mirror disposed on an optical axis and away from each other, said first and second mirrors respectively having reflecting surfaces opposite to each other, an optical path for a laser beam to reciprocate being formed between said first and second mirrors, the reflecting surface of at least one mirror of said first and second mirrors being constituted by a conical surface having a vertex angle of 90 degrees, this conical surface being in alignment at a vertex thereof with said optical axis and diverged toward the other mirror opposite to said one mirror from said vertex at an angle of 45 degrees with respect to said optical axis, said first and second mirrors provide the laser beam to be highly tangentially polarized with respect to the optical axis and said second mirror permitting a part of the laser beam from said optical path to transmit;

(b) a laser medium disposed between said first and second mirrors;

(c) pumping means for pumping said laser medium;

(d) a convex lens for condensing the laser beam transmitted through and emitted from said second mirror, said convex lens being disposed on said optical axis in such a manner that said second mirror is disposed between said first mirror and said convex lens; and

(e) a metal wave guide tube having a circular shape in section, one end of said wave guide tube being disposed on said optical axis in such a manner that said convex lens is disposed between said second mirror and said one end of said wave guide tube, thereby one end of said wave guide tube receives the laser beam condensed by said convex lens, an inner peripheral surface of said wave guide tube being provided as a reflecting surface for efficiently transmitting the tangentially polarized laser beam.

5,463,652

COMBINING OPTICS FOR RING LASER GYRO

David B. Hall, La Crescenta, Calif., assignor to Litton Systems, Inc., Woodland Hills, Calif.

Filed Oct. 1, 1987, Ser. No. 103,842

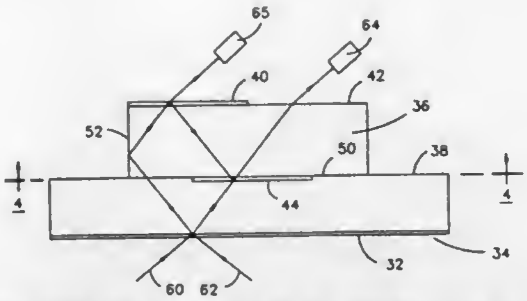
Int. Cl.⁶ G01C ***19/64;*** **H01S** ***3/04***

U.S. Cl. 372—94 **5 Claims**

1. An optical system for extracting a portion of two counterpropagating beams from a ring laser which includes laser corner mirrors each having a substrate, and to beat said beams together, comprising:

a prism having first outer and second inner parallel optically flat surfaces and a third optically flat surface perpendicular to said first and second surfaces;

said prism having a first partly transmissive mirror, on said first surface;



said prism being attached to the said substrate of one of said laser corner mirrors with said first and second optically flat surfaces substantially parallel to said one corner mirror;

said third optically flat surface being positioned to intercept and reflect light transmitted through said one corner mirror from a first one of the two counterpropagating beams of said ring laser;

said first mirror being positioned and configured on said first flat surface to intercept said beam reflected from said third surface and both to transmit and reflect portions of said intercepted beam;

a second mirror, positioned and configured at the interface between said substrate and said second flat surface on said prism to intercept the reflected portion of said beam reflected from said first mirror and to intercept and transmit a portion of the second one of the two counterpropagating beams of said ring laser, transmitted through said one corner mirror, substantially collinearly with its said reflected beam; and

a light sensor positioned to receive said two substantially collinear beams from said second mirror.

5,463,653

POWER CONVERTER DEVICE FOR DIRECT CURRENT POWER SUPPLY TO AN ELECTRIC ARC FURNACE

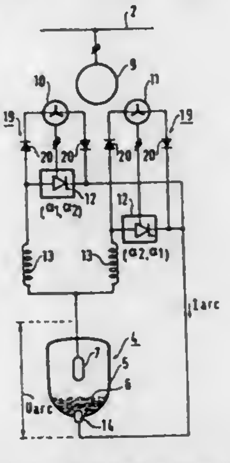
Jacques Du Parc, Recloses; Christophe Glinski, Ermont, and Michel Wursteisen, Montigny S/Loing, all of, France, assignors to Cegelec Metals Systems, Avon, France

Filed Apr. 26, 1994, Ser. No. 233,683

Claims priority, application France, Apr. 30, 1993, 93 05183; Jan. 22, 1993, 93 12661

Int. Cl.⁶ H05B ***7/144***

U.S. Cl. 373—108 **11 Claims**

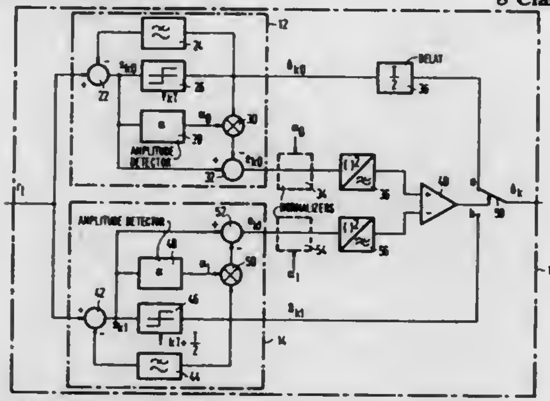


1. A power converter device for supplying direct current to an electric arc furnace including a load, said power converter comprising at least one transformer with its primary fed with a three-phase alternating current and delivering to at least one of its secondary a three-phase current, said at least one secondary applying said three-phase current to rectifier means for outputting to the load a rectified voltage and current, said rectifier means comprising controlled semiconductors for each said secondary and a freewheel circuit, said controlled semiconductors being triggered with variable firing angles, modified to increase a duration of time during

which the freewheel circuit conducts said three-phase current whilst reducing a duration of time during which the triggered semiconductors conduct said three-phase current, and vice versa, so as to deliver to the load a substantially constant active power or reactive power despite variations in impedance of the load.

5,463,654
TRANSMISSION SYSTEM WITH INCREASED SAMPLING RATE DETECTION

Johannes W. M. Bergmans, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Jul. 28, 1993, Ser. No. 98,673
Claims priority, application European Pat. Off., Aug. 3, 1992, 92202394
Int. Cl.^{6} G01H *1/00*
U.S. Cl. 375—341 8 Claims



5. A data receiver comprising

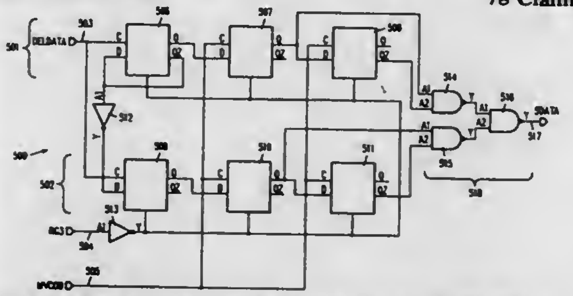
deriving means for deriving a detection signal from an output signal of a channel,

detection means for deriving a sequence of data symbols carried by the detection signal from N values of the detection signal per symbol interval, where N is an integer, the detection means including a plurality of sub-detection means, each of the sub-detection means being arranged for determining a respective sequence of data symbols on the basis of at least one of the N values of the detection signal per symbol interval where N is an integer such that N≧2 and determining a reliability measure associated to the respective sequence of data symbols, and

selection means for selecting symbols from the sequence of data symbols for which the associated reliability measure denotes a maximum reliability.

5,463,655
SINGLE-ENDED PULSE GATING CIRCUIT

William D. Llewellyn, San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.
Filed Feb. 17, 1993, Ser. No. 18,622
Int. Cl.^{6} H04L *7/02*
U.S. Cl. 375—359 78 Claims



1. A data latch for providing synchronous data comprising:

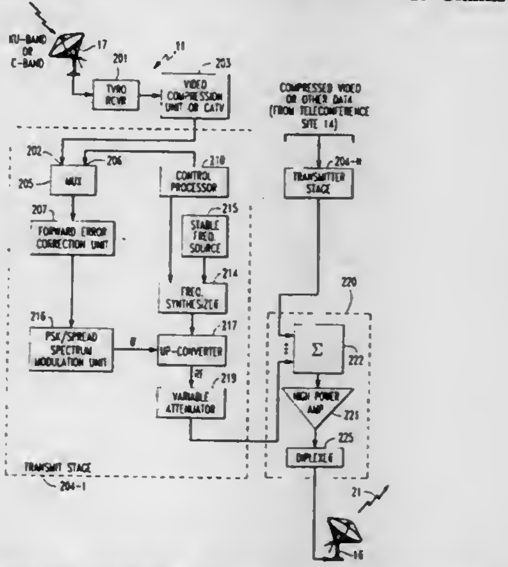
a first plurality of flip-flops triggered by even data pulses to provide a first logic state signal, said first plurality of flip-flops triggered by odd data pulses to provide a second logic state signal;

a second plurality of flip-flops triggered by said even data pulses to provide said second logic state signal, said second plurality of flip-flops triggered by said odd data pulses to provide said first logic state signal; and

combinational logic to couple said first plurality of flip-flops and said second plurality of flip-flops to provide said synchronous data, wherein each flip-flop includes a data input terminal, a clock input terminal, and a first output terminal, wherein said even and odd data pulses are provided to the clock input terminal of a first flip-flop in said first plurality of flip-flops and the clock input terminal of a second flip-flop in said second plurality of flip-flops.

5,463,656
SYSTEM FOR CONDUCTING VIDEO COMMUNICATIONS OVER SATELLITE COMMUNICATION LINK WITH AIRCRAFT HAVING PHYSICALLY COMPACT, EFFECTIVELY CONFORMAL, PHASED ARRAY ANTENNA

Alan L. Polivka, Palm Bay, and Charles Zahm, Indialantic, both of Fla., assignors to Harris Corporation, Melbourne, Fla.
Filed Oct. 29, 1993, Ser. No. 146,289
Int. Cl.^{6} H04N *7/167;* H04B *1/69*
U.S. Cl. 375—200 29 Claims



1. A method of conducting video communications between a first site and a second site comprising the steps of:

(a) digitally compressing an input video signal, said video signal containing the entirety of the contents of a video image having no frequency information removed therefrom, to derive a compressed bandwidth video signal;

(b) modulating a carrier signal, to be transmitted from said first site to said second site, with said compressed bandwidth video signal;

(c) spreading the spectral density of the modulated carrier signal obtained in step (b) and thereby causing the spectral density of the entirety of the image information contents of said video image, as contained in said compressed bandwidth video signal to be spread and transmitting the resulting spread signal to said second site; and

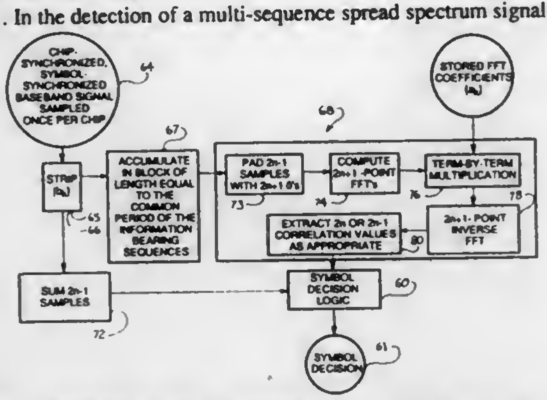
(d) at said second site, receiving the spread signal transmitted in step (c) by way of a phased array antenna.

5,463,657
DETECTION OF A MULTI-SEQUENCE SPREAD SPECTRUM SIGNAL

Bart F. Rice, Santa Cruz, Calif., assignor to Lockheed Missiles & Space Company, Inc., Sunnyvale, Calif.

Filed Feb. 15, 1994, Ser. No. 196,577
Int. Cl.^{6} H04B *1/69*
U.S. Cl. 375—200 **9 Claims**

1. In the detection of a multi-sequence spread spectrum signal, a block correlation method for generating correlation values associated with a received signal and a plurality of candidate sequences, the method comprising:


CHIP-SYNCHRONIZED, SYMBOL-SYNCHRONIZED BASEBAND SIGNAL SAMPLED ONCE PER CHIP
64
STORED FFT COEFFICIENTS
68
67
STRIP
ACCUMULATE IN BLOCK OF LENGTH EQUAL TO THE COMMON PERIOD OF THE INFORMATION BEARING SEQUENCES
PAD 2n-1 SAMPLES WITH 2n+1 0's
COMPUTE 2n+1-POINT FFT's
TERM-BY-TERM MULTIPLICATION
73
74
76
78
65
66
EXTRACT 2n OR 2n-1 CORRELATION VALUES AS APPROPRIATE
80
2n+1-POINT INVERSE FFT
SUM 2n-1 SAMPLES
SYMBOL DECISION LOGIC
60
72
SYMBOL DECISION
61

receiving a signal comprising a first transmitted sequence and a second transmitted sequence;

stripping the second transmitted sequence from the received signal to form a stripped signal; and

generating correlation values as a function of the stripped signal and a replica of the first transmitted sequence at a plurality of offsets,

wherein the generating step comprises the substeps of:

padding the stripped signal with zeroes to form a first extended data sequence;

generating a first set of coefficients by performing a discrete Fourier transform on the first extended data sequence;

padding a replicated first transmitted sequence with zeroes to form a second extended data sequence;

generating a second set of coefficients by performing a discrete Fourier transform on the second extended data sequence;

generating a set of product coefficients by multiplying each coefficient in the first set by the complex conjugate of a corresponding coefficient in the second set; and

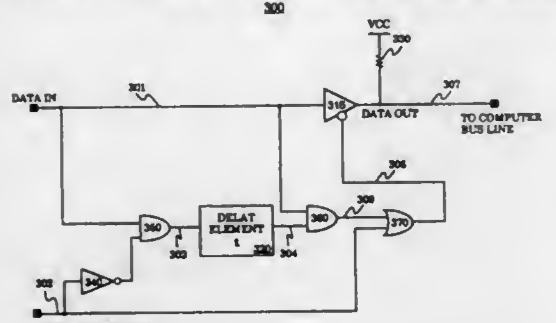
generating correlation values by computing the inverse discrete Fourier transform of the product coefficients.

5,463,658
LOW IMPACT COLLISION DETECTION METHOD

Dawson L. Yee, Beaverton, Oreg., assignor to Intel Corporation, Santa Clara, Calif.

Filed Mar. 23, 1994, Ser. No. 216,668
Int. Cl.^{6} H04B *3/00*
U.S. Cl. 375—257 **18 Claims**

1. A bus driver circuit for transmitting data on a bus in response to a data signal, the bus including at least one conductor for transmitting the data signal, the bus driver circuit comprising:



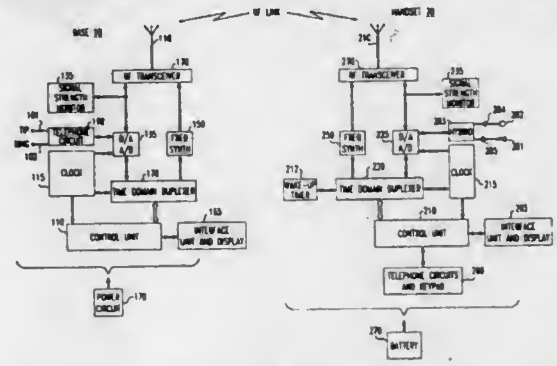
a driver coupled to the conductor, the driver for biasing the conductor to a first voltage level when the data signal is in a first state, the driver for biasing the conductor to a second voltage level for a first amount of time in response to the data signal being in a second state, wherein the first amount of time is less than a second state time during which the data signal is in the second state; and

a resistive element coupled to a supply voltage for biasing the conductor to at least the second voltage for a remainder of the second state time if no bus agent coupled to the conductor is attempting to bias the conductor to the first voltage level.

5,463,659
APPARATUS AND METHOD OF CONFIGURING A CORDLESS TELEPHONE FOR OPERATING IN A FREQUENCY HOPPING SYSTEM

William J. Nealon, Neptune City, and Heidi A. Rajan, Morganville, both of N.J., assignors to AT&T IPM Corp., Coral Gables, Fla.

Continuation-in-part of Ser. No. 270,348, Jul. 5, 1994. This application Nov. 3, 1994, Ser. No. 333,681
Int. Cl.^{6} H04B *1/713*
U.S. Cl. 375—202 **15 Claims**



1. A cordless telephone including a base unit connectable to a telephone line and a plurality of handset units for communicating with the base unit over any one of a plurality of communication channels in a frequency hopping system, the base unit including a first transmitter and a first receiver for respectively transmitting to a second receiver and receiving from a second transmitter in each of the plurality of handset units, the cordless telephone comprising:

means for configuring both the base unit and the plurality of handset units on a predetermined channel for registering each one of the plurality of handset units for operation with the base unit;

means for reducing the transmitted power from said first transmitter and said second transmitter from a first level to a second reduced level;

means for generating in the base unit data indicative of both a security code and a starting channel for each one of the plurality of handset units; and

means for transmitting in said first transmitter to each one of the plurality of handset units data indicative of both the security code and the starting channel for each one of the plurality of handset units.

5,463,660

BLOCK-SPREADING CODE-DIVISION MULTIPLE-ACCESS DEMODULATOR WITH IMPROVED INTERFERENCE CANCELLATION

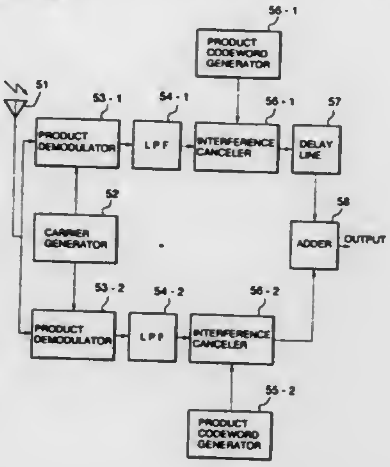
Atsushi Fukasawa; Manabu Kawabe; Akiyoshi Kawahashi, and Takuro Sato, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Aug. 3, 1994, Ser. No. 283,172

Claims priority, application Japan, Aug. 31, 1993, 5-215417

Int. Cl.^{6} H04B *1/69*

U.S. Cl. 375—205 **16 Claims**



1. A demodulator for block-spreading code-division multiple-access communications, in which blocks of transmit data are converted to codewords taken from a set of orthogonal codewords common to all transmitting stations, then spread by spreading codes assigned to individual transmitting stations, comprising:

a memory divided into separate memory areas for different transmitting stations, each memory area storing received chip data and updated chip data for a plurality of blocks including at least a newest block and an oldest block;

a product codeword generator for generating a spreading code used by a designated transmitting station, and using said spreading code to spread all codewords in said set of orthogonal codewords, thereby producing corresponding product codewords;

a correlator coupled to correlate data in each of said plurality of blocks in a designated memory area in said memory with said product codewords, to select for each of said blocks a particular product codeword which gives a maximum correlation value, and to output, for said oldest block, said maximum correlation value and information identifying a codeword which was spread to produce said particular product codeword;

an interference estimator coupled to use said particular product codeword and said maximum correlation value to calculate interference correction data, said interference correction data being an estimate of interference that was generated by said designated station and has not yet been canceled;

an interference subtractor coupled to update all data stored in said memory, except data stored in said designated memory area, by subtracting said interference correction data, thereby canceling interference; and

a controller for recognizing block boundaries and, when a transmitting station completes transmission of a block, designating that station as said designated station and designating the corresponding memory area in said memory as said designated memory area.

5,463,661

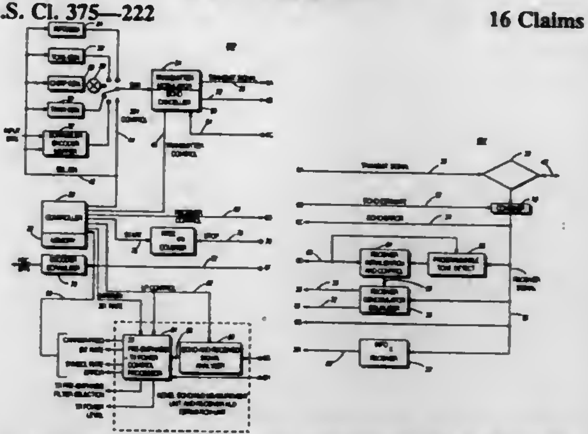
TX PREEMPHASIS FILTER AND TX POWER CONTROL BASED HIGH SPEED TWO WIRE MODEM

John L. Moran, III, Millville; Manickam R. Sridhar, Holliston, both of Mass., and William L. Brown, Mississauga, Canada, assignors to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 23, 1995, Ser. No. 393,611

Int. Cl.^{6} H04L *5/16*

U.S. Cl. 375—222 **16 Claims**



1. A two-wire modem for, upon transmitting, for a first predetermined time segment, a first line probing signal of varying frequency content and varying power level/levels over communication media, selecting a carrier frequency and a symbol rate from a predetermined plurality of carrier frequencies and symbol rates, a transmitter preemphasis filter and a transmitter power level determined from estimated characteristics of said communication media, to communicate with another modem over said communication media in a full duplex mode, said two-wire modem comprising:

A) an echo and received signal analyzer for:

receiving at least one echo signal of said first line probing signal of varying frequency content and varying power level/levels from said communication media in said first predetermined time segment and estimating echo characteristics of said communication media based on an analysis of said received at least one echo signal of said first line probing signal; and

receiving a second line probing signal of varying frequency content and varying power level/levels from said communication media in a second predetermined time segment and estimating signal characteristics of said communication media based on an analysis of said received second line probing signal.

and

B) a TX preemphasis and TX power control processor, operably coupled to the echo and received signal analyzer, for selecting said carrier frequency and symbol rate from the predetermined plurality of carrier frequencies and symbol rates, the transmitter preemphasis filter from the plurality of predetermined transmitter preemphasis filters, and the transmitter power level using said estimates of the signal and echo characteristics of said communication media.

5,463,662

APPARATUS AND METHOD FOR REDUCING ERRORS IN DATA CAUSED BY NOISE THROUGH USE OF BLANKING

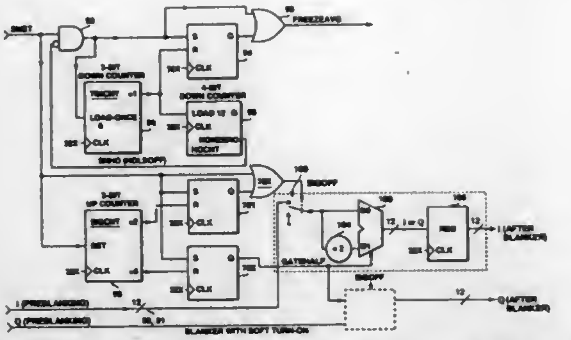
Philip H. Sutterlin, San Jose; Walter J. Downey, Los Gatos; Benjamin W. Chui, Sunnyvale; J. Marcus Stewart, San Jose, and Amy O. Hurlbut, San Francisco, all of Calif., assignors to Echelon Corporation, Palo Alto, Calif.

Filed Apr. 8, 1994, Ser. No. 225,247

Int. Cl.^{6} H04B *1/10*

U.S. Cl. 375—351 **20 Claims**

1. In a circuit where an information carrying signal is examined for noise pulses and the information carrying signal is blanked



during the noise pulses to reduce interference between the noise pulses and the information, an improved method for operation of the circuit comprising the steps of:

converting the information carrying signal to first digital signals;

determining a second digital signal representative of an average of the first digital signal;

multiplying the second digital signal by a predetermined number to provide a third digital signal;

comparing the third digital signal to the first digital signals; and

blanking the first digital signals during the occurrence of at least some of the noise pulses.

5,463,663

CONTROLLING SYNCHRONIZATION IN A SYSTEM HAVING A PLURALITY OF UNITS WHEN A UNIT IS DISCONNECTED FROM OR CONNECTED TO THE SYSTEM THAT IS ACTIVE

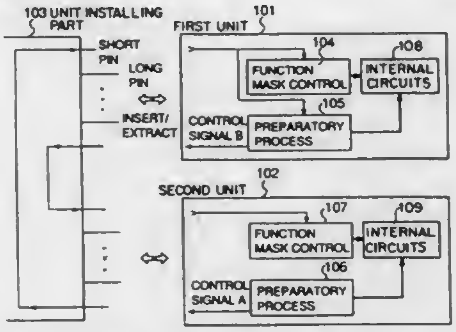
Takumi Maruyama; Takashi Onodera; Nobuko Hatakenaka, all of Kawasaki; Hiroaki Uno, Osaka, and Noriyuki Yokoshi, Kawasaki, all of, Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Filed Jan. 31, 1994, Ser. No. 189,056

Claims priority, application Japan, Sep. 20, 1993, 5-256381

Int. Cl.^{6} H04L *7/00*

U.S. Cl. 375—356 **8 Claims**



1. An apparatus for controlling synchronization in a system having a plurality of units when one of the units is disconnected from or connected to the system that is active, wherein a prescribed function is carried out by a combination of the units including a first unit and a second unit, and both the units have a set of internal circuits to carry out the prescribed function and are removably installed on a unit installing part, said apparatus comprising:

signal path means, provided within the unit installing part, through which a control signal output from the second unit is sent to the first unit and a control signal output from the first unit is sent to the second unit;

first preparatory process means for carrying out a preparatory process to place the internal circuits of the second unit in an operating state when the second unit is connected to the system, and for outputting a control signal to the signal path means at the end of the preparatory process;

first function mask control means for stopping the operation of the internal circuits of the second unit when the control signal from the first unit is not received through the signal path means, and for re-starting the operation of the internal circuits of the second unit when the control signal from the first unit is received through the signal path means;

second preparatory process means for carrying out a preparatory process to place the internal circuits of the first unit in an operating state when the control signal from the second unit is received through the signal path means, and for outputting control signal to the signal path means at the end of the preparatory process; and

second function mask control means for stopping the operation of the internal circuits of the first unit when the control signal from the second unit is not received through the signal path means, and for re-starting the operation of the internal circuits of the first unit when the control signal from the second unit is received through the signal path means.

5,463,664

DQPSK DELAY DETECTION CIRCUIT THAT PRODUCES STABLE CLOCK SIGNAL IN RESPONSE TO BOTH I AND Q SIGNALS

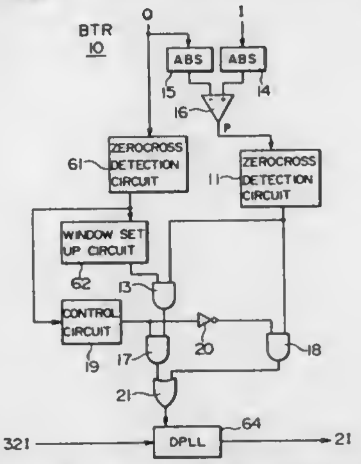
Kazuyoshi Nakaya, Kanagawa, Japan, assignor to Murata Mfg. Co., Ltd., Kyoto, Japan

Filed Nov. 23, 1993, Ser. No. 156,336

Claims priority, application Japan, Dec. 7, 1992, 4-325879

Int. Cl.^{6} H04L *7/02;* **H03D** *3/22*

U.S. Cl. 375—360 **12 Claims**



6. A bit timing recovery unit for use in a differential quadrilateral phase shift keying (DQPSK) delay detection circuit, comprising:

means for receiving orthogonal signals as I and Q signals;

means for calculating an absolute value of said I and Q signals;

means for producing a difference signal from said absolute value of said I and Q signals;

means for generating a first zero-cross timing signal from said difference signal;

means for generating a second zero-cross timing signal from said Q signal which becomes zero at every symbol rate period;

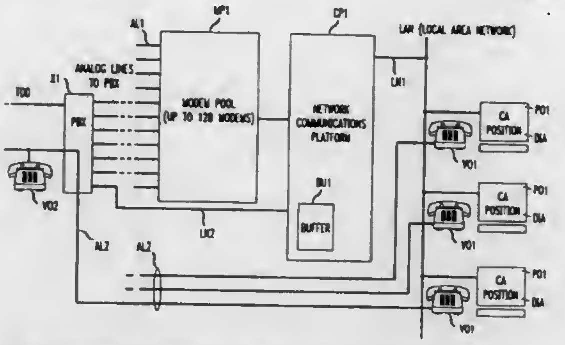
means for obtaining a timing signal from said first and second zero-cross timing signals which synchronizes with said every symbol rate period;

means for generating a 2f clock signal on the basis of said timing signal, said means for generating including means for controlling advance and delay in the phase of said 2f signal on the basis of said timing signal.

5,463,665

RELAYING OF MESSAGES BETWEEN HEARING IMPAIRED CALLERS USING KEYBOARDS AND OTHER CALLERS

William L. Millios, Washington, D.C., and David E. Schulz, Wheaton, Ill., assignors to AT&T Corp., Murray Hill, N.J.
Filed Nov. 4, 1993, Ser. No. 147,391
Int. Cl.^{6} H04M *11/00*
U.S. Cl. 379—52 **24 Claims**



1. The method of relaying a call between a telephone device for the deaf (TDD) and other users, comprising:

automatically prompting a TDD caller with a generic signal which is absent of demands for specific calling information and permits natural language. response;

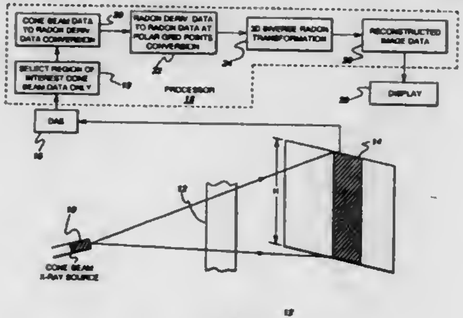
parsing the received natural language response for calling information to determine a forward number; and

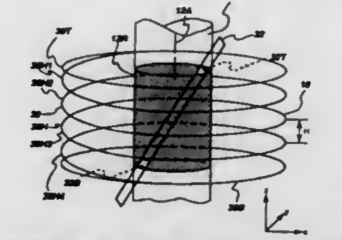
routing the call to one of a number of communication assistants.

5,463,666

HELICAL AND CIRCLE SCAN REGION OF INTEREST COMPUTERIZED TOMOGRAPHY

Jeffrey W. Eberhard, and Kwok C. Tam, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.
Filed Nov. 12, 1993, Ser. No. 150,318
Int. Cl.^{6} A61B *6/03;* G01N *23/08*
U.S. Cl. 378—4 **21 Claims**


CONE BEAM DATA TO RADON DERIV DATA CONVERSION
RADON DERIV DATA TO RADON DATA AT POLAR GRID POINTS CONVERSION
3D INVERSE RADON TRANSFORMATION
RECONSTRUCTED IMAGE DATA
SELECT REGION OF INTEREST CONE BEAM DATA ONLY
PROCESSOR
DISPLAY
DAS
CONE BEAM X-RAY SOURCE



1. A a scanning and data acquisition method for three-dimensional computerized tomography (CT) imaging of an object only partially in a field of view radially centered on a predetermined axis, the method comprising the steps of:

applying cone beam energy from a cone beam source to at least a portion of the object;

defining a source scanning trajectory as a path traversed by the source;

using the cone beam source fixed relative to an area detector with both source and detector moveably positioned relative to the object to scan about the object;

specifying the source scanning trajectory as a first circle, a second circle, and a helical portion connecting the first and second circles and defining a plurality of mutually spaced stages on a predetermined geometric surface surrounding the field of view such that each plane passing through the field of view intersects the scanning trajectory in at least one point, the area detector having a predetermined dimension extending sufficiently along a direction generally parallel to the predetermined axis to span at least the two consecutive stages having the largest spacing therebetween;

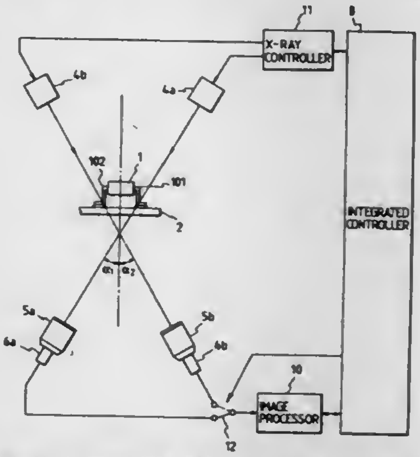
scanning at a plurality of positions along the source scanning trajectory to obtain cone beam projection data corresponding to respective portions of the object; and

selecting cone beam projection data corresponding to energy which is passed only through a region of interest of the object which is smaller than the object itself and which is completely within the field of view to provide a data set which can be reconstructed into an image of the region of interest of the object.

5,463,667

INSPECTION METHOD FOR SOLDERED JOINTS USING X-RAY IMAGING AND APPARATUS THEREFOR

Toshiaki Ichinose, Yokohama; Takanori Ninomiya, Hiratsuka; Asahiro Kuni, Setagaya; Kozo Nakahata, Chigasaki; Toshimitsu Hamada, and Toshihiko Ayabe, both of Yokohama, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Apr. 28, 1993, Ser. No. 53,240
Claims priority, application Japan, Apr. 30, 1992, 4-111337
Int. Cl.^{6} G01N *23/04*
U.S. Cl. 378—58 **6 Claims**



1. A method for inspecting a soldered joint with an X-ray, the soldered joint being formed by soldering a lead to a surface of a substrate, the method comprising the steps of:

moving the substrate so as to move the surface of the substrate in an XY plane to position the soldered joint at a desired position in the XY plane;

rotating the substrate so as to rotate the surface of the substrate in the XY plane to position the soldered joint at a desired orientation in the XY plane;

rotating an X-ray source and a detector about the soldered joint in both of two mutually perpendicular planes perpendicular to the XY plane while maintaining the X-ray source and the detector at fixed positions relative to each other to establish a desired oblique irradiation angle between an X-ray from the X-ray source and the lead on the surface of the substrate;

irradiating the soldered joint with the X-ray from the X-ray source at the desired oblique irradiation angle such that the X-ray is transmitted through the soldered joint and the substrate;

detecting the X-ray transmitted through the soldered joint and the substrate with the detector, the detector producing an output signal indicative of the detected X-ray; and

determining a condition of the soldered joint based on the output signal of the detector.

5,463,668

X-RAY DIAGNOSIS APPARATUS

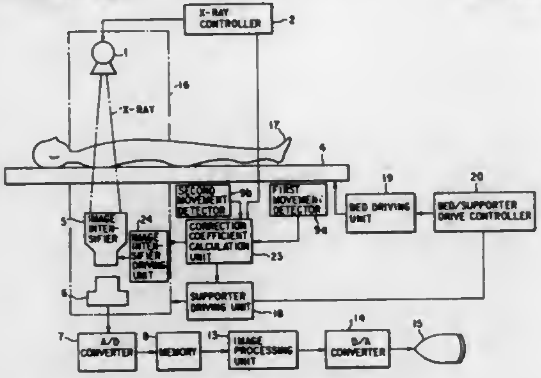
Shinichiro Kagaya, Tochigi, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 14, 1994, Ser. No. 305,894

Claims priority, application Japan, Sep. 14, 1993, 5-229013; Apr. 8, 1994, 6-070555; Sep. 6, 1994, 6-212454

Int. Cl.^{6} A61B *6/00*

U.S. Cl. 378—98.2 **24 Claims**



1. An X-ray diagnosis apparatus comprising:

a bed on which an object is placed;

supporting means on which X-ray irradiation means for irradiating a predetermined amount of X-rays to said object on said bed and converting means for converting X-rays passed through said object into an object image signal are mounted;

first moving means for moving said bed;

second moving means for moving said supporting means; and

drive control means for controlling movement of at least said converting means in such a manner that said object appears to be stopped as viewed from said converting means while said bed and said supporting means are moved relative to each other by said first moving means and said second moving means and X-rays are irradiated from said X-ray irradiation means.

5,463,669

DENTAL X-RAY ALIGNMENT SYSTEM

Jerome I. Kaplan, 4417 N. Pennsylvania, Indianapolis, Ind. 46205

Filed Sep. 8, 1994, Ser. No. 302,524

Int. Cl.^{6} A61B *6/08*

U.S. Cl. 378—205 **22 Claims**

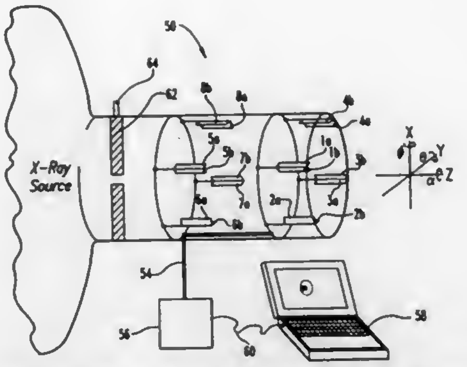
1. A dental X-ray alignment system for aiming a dental X-ray apparatus at an X-ray receiving device, comprising:

a magnet;

magnet positioning means for maintaining the magnet in a fixed relation with the X-ray receiving device;

a plurality of first magnetic field strength detectors mounted in a fixed relation to the dental X-ray apparatus;

measurement means operatively coupled to the first detectors for measuring a magnetic field strength of the magnet at a location of each of the first detectors; and



processing means operatively coupled to the measurement means for calculating misalignment of the dental X-ray apparatus with the X-ray receiving device in at least two linear dimensions and at least two angular dimensions.

5,463,670

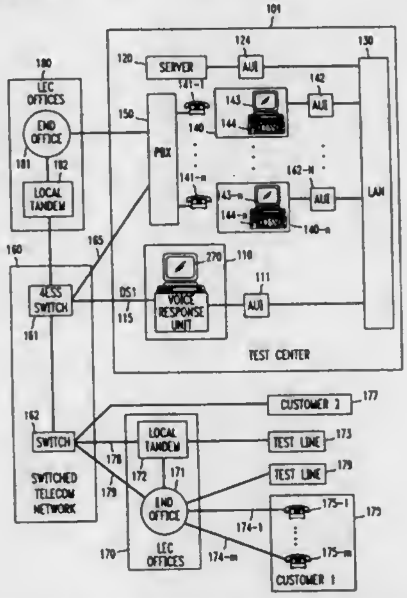
TESTING OF COMMUNICATION SERVICES AND CIRCUITS

Marilyn C. Chiang, Manalapan; R. Earl Fenley, Jr., Point Pleasant; George F. Holland, Neshanic; Anand K. Javvaji, and Ramadevi Sreedhara, both of Iselin, all of N.J., assignors to AT&T IPM Corp., Coral Gables, Fla.

Filed Oct. 23, 1992, Ser. No. 965,458

Int. Cl.^{6} H04M *1/24*

U.S. Cl. 379—27 **5 Claims**



1. A system for testing communications circuits comprising

a voice response unit connected to a telecommunications network, said VRU arranged to perform a series of actions in response to messages, said actions including (a) initiating at least one test call, (b) playing pre-stored speech phrases to the answering party, and (c) monitoring the progress and disposition of said at least one test call, said monitoring including establishing an agent voice path whereby a technician can listen on said test call and communicate with said answering party, and

a workstation arranged to send messages to said VRU to initiate and conduct testing by performing a sequence of said actions.

5,463,671

TELECOMMUNICATIONS NETWORK HAVING A DISTRIBUTED NETWORK OF DECENTRALIZED LOCAL STATIONS

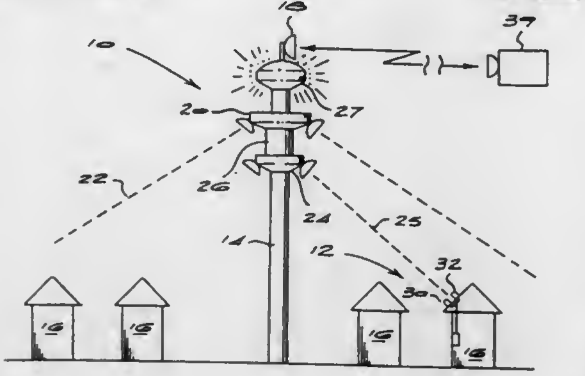
Michael J. C. Marsh, Johannesburg, and Trevor M. Hodson, Transvaal, both of, South Africa, assignors to CSIR, Pretoria, South Africa

Filed Nov. 16, 1993, Ser. No. 152,503

Claims priority, application South Africa, Nov. 16, 1992, 92/8822

Int. Cl.^{6} H04Q *7/00*

U.S. Cl. 379—56 **10 Claims**



1. A telecommunications network comprising:
- a distributed network of decentralized local stations interconnected by a plurality of telecommunications links, each local station being arranged to service a settlement of dwellings, and a plurality of static subscriber stations configured in a cluster around a local station, each static subscriber station having a unique identification code and being associated with a dwelling in the settlement, wherein each local station includes:
  - a) an elevated optical transmitter arranged to transmit a common optical telecommunications footprint over the plurality of static subscriber stations;
  - b) an elevated optical receiver arranged to receive from each of the subscriber stations directional optical telecommunications signals;
  - c) local station transceiver means for serially transmitting and receiving voice and data signals to and from other local stations in the network via the telecommunications links;
  - d) a local exchange including first switching means for connecting calls between one static subscriber station and another within a particular local station, second switching means for connecting calls between a static subscriber station a remote local station remote from the subscriber station, and third switching means for connecting calls from one neighboring local station to another via the local station;
  - e) a routing database linked to the local exchange for assisting in routing calls to distal local stations along at least one path;
  - f) a subscriber database incorporating details of static subscriber stations linked directly to a particular local station and including the unique identification codes of and telephone numbers assigned to each static subscriber station, and
  - g) at least one database controller for controlling the operation of the subscriber and routing databases.

5,463,672

PERSONAL MOBILE COMMUNICATIONS SYSTEM HAVING CENTRAL STATION FOR PAGING MOBILE USERS VIA BASE STATIONS

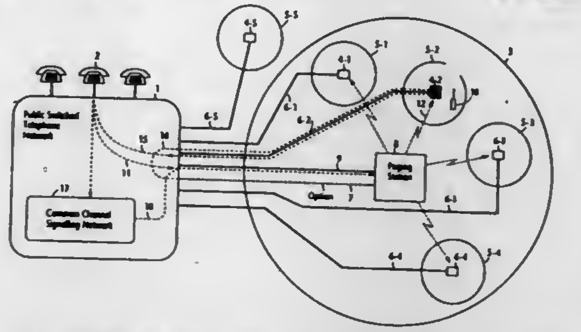
Kouzou Kage, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Dec. 14, 1992, Ser. No. 989,695

Claims priority, application Japan, Dec. 12, 1991, 3-329097; Dec. 12, 1991, 3-329098; Dec. 25, 1991, 3-343602; Dec. 25, 1991, 3-343603; Dec. 25, 1991, 3-343604; Dec. 25, 1991, 3-343605; Jan. 20, 1992, 4-007636

Int. Cl.^{6} H04Q *7/22*

U.S. Cl. 379—59 **4 Claims**


Public Switched Telephone Network
Common Channel Signalling Network
Paging Station
Option
2
1
6-5
5-5
5-1
5-2
3
5-3
5-4
6-1
6-2
6-3
6-4
7

1. A personal mobile communications system for servicing a plurality of cells, comprising:
- a mobile station for transmitting a position registration request containing a mobile user address code identifying the mobile station;
- a plurality of base stations located respectively in said cells and connected to a public switched telephone network (PSTN), each base station including means for receiving the position registration request from said mobile station and transmitting a base registration request containing the mobile user address code of the position registration request and a base station identifier identifying the base station via a communication path; and
- a central station connected to said PSTN and including:
  - memory;
  - means for receiving the base registration request from each base station via said communication path, and storing the mobile user address code and the base station identifier of the base registration request into said memory; and
  - means for receiving from said PSTN a first call-set-up signal containing a PSTN user address code and a mobile user address code, and in response, broadcasting a call-setup signal containing a said base station identifier stored in said memory, a said mobile user address code stored in said memory and the PSTN user address code of the call-setup signal from the PSTN in an area covering said plurality of said cells if there is a match between the mobile user address code of the call-setup signal from the PSTN and a mobile user address code stored in said memory,
- each of said base stations including means for receiving the broadcast call-setup signal which contains the identifier of the base station, and alerting a said mobile station and transmitting the PSTN user address code of the call-setup signal to the PSTN when the alerted mobile station returns a response signal.

5,463,673

IN-BUILDING RADIO DEPLOYMENT TECHNIQUE FOR WIRELESS PERSONAL COMMUNICATIONS SYSTEMS

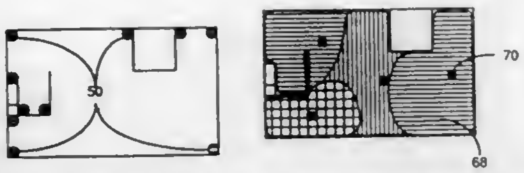
Bernard Herscovici, Kanata, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Apr. 29, 1993, Ser. No. 53,749

Int. Cl.^{6} H04B *15/00*

U.S. Cl. 379—59 **8 Claims**

1. In an in-building wireless telephone system having a plurality of base stations which are located at cell centers within a wireless



telephone coverage area, the coverage area being partitioned into a plurality of cells, a method of determining precise locations of cell centers for the base stations comprising steps of:

(1) locating wireless measuring handsets at several critical points of the coverage area of a first cell;
(2) locating a wireless measuring base station at an approximate cell center of the first cell;
(3) determining the precise location of the cell center of the first cell by monitoring the RSSI of a measuring signal transmitted between each of the wireless measuring handsets and the wireless measuring base station;
(4) mapping a cell edge of the first cell;
(5) locating measuring handsets at other critical points and one or more points along the cell edge of the first cell;
(6) locating a measuring base station at an approximate cell center of a second cell adjacent to the first cell;
(7) determining the precise location of the cell center of the second cell by monitoring the RSSI of a measuring signal transmitted between each of the wireless measuring handsets and the wireless measuring base station;
(8) mapping a cell edge of the second cell; and
(9) repeating steps (5) to (8) for all the cells adjacent to each other within said coverage area.

5,463,674

CELLULAR CORDLESS TELEPHONE WHICH POLLS INFORMATION IN A MEMORY TO DETERMINE A PRE-SELECTED PREFERENCE AND A STORED AVAILABILITY OF CALL FORWARDING

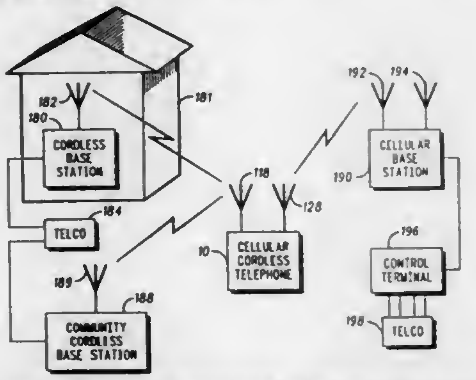
Steven F. Gillig, Roselle, and Glen E. Pederson, St. Charles, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 134,431, Oct. 12, 1993, abandoned, which is a division of Ser. No. 103,169, Aug. 6, 1993, abandoned, which is a continuation of Ser. No. 826,322, Jan. 2, 1992, abandoned, which is a division of Ser. No. 660,180, Feb. 25, 1991, Pat. No. 5,127,042, which is a continuation of Ser. No. 516,375, Apr. 30, 1990, abandoned, which is a division of Ser. No. 249,041, Sep. 23, 1988, Pat. No. 4,989,230. This application Jul. 15, 1994, Ser. No. 275,883

The portion of the term of this patent subsequent to Jan. 29, 2008, has been disclaimed.

Int. Cl.^{6} H04Q *7/38*

U.S. Cl. 379—59 **1 Claim**



1. A method of receiving incoming telephone calls in a cellular cordless telephone that has a memory and can receive a call according to a preselected preference of either cellular telephone calls to a cellular telephone number on cellular radio channels of a cellular telephone system or cordless telephone calls on at least one cordless radio channel of a base station coupled to a telephone landline having a landline telephone number in a landline telephone system, said landline telephone number having call forwarding and being call forwarded by the landline telephone system to said cellular telephone number when not answered after a predetermined number of rings, said cellular telephone number having call forwarding and being call forwarded by the cellular telephone system to said landline telephone number when not answered after a predetermined number of rings, the preselected preference and the availability of call forwarding being stored as predetermined information in the memory of the cellular cordless telephone, said method comprising the steps of:

polling the predetermined information in the memory to determine the stored pre-selected preference and the stored availability of call forwarding;

accepting an incoming telephone call when said incoming telephone call matches said stored preselected preference;

ignoring an incoming telephone call when said incoming telephone call does not match said stored preselected preference and when the stored availability of call forwarding has been determined; and

accepting a subsequent incoming call when said subsequent incoming call matches said stored preselected preference.

5,463,675

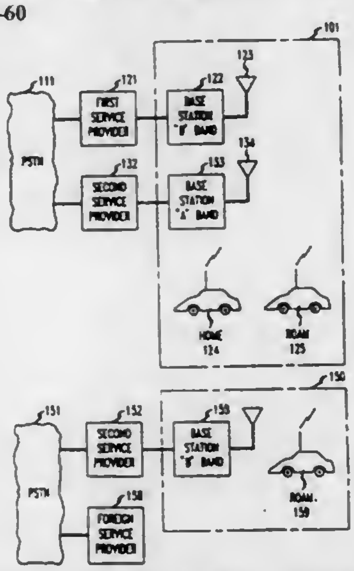
EXTENDED HOME INDENTIFICATION BEING USED BY THE SAME SERVICE PROVIDER AS A HOME IDENTIFICATION IN A SERVICE AREA OTHER THAN THE HOME SERVICE AREA FOR CELLULAR RADIO TELEPHONE SYSTEMS

Irwin Gerszberg, Lakewood, N.J., assignor to AT&T IPM Corp., Coral Gables, Fla.

Continuation-in-part of Ser. No. 957,644, Oct. 6, 1992, abandoned, which is a continuation-in-part of Ser. No. 716,453, Jun. 17, 1991, abandoned. This application Feb. 10, 1994, Ser. No. 195,980

Int. Cl.^{6} H04Q *7/22*

U.S. Cl. 379—60 **2 Claims**



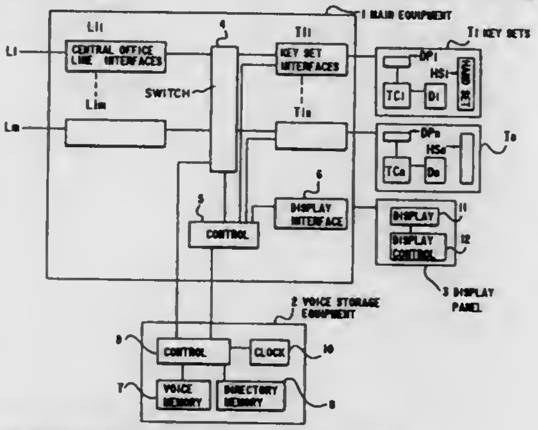
1. In a cellular mobile radio telephone communications system having A band and B band frequencies in each service area and in which a service provider is assigned one of the A band and B band of frequencies in a home service area and another different one of the A band and B band of frequencies in a service area other than the home service area, a method for predisposing a mobile radiotelephone to select service from the same service provider in the home service area and the service area other than the home service area, comprising the steps of:

storing in the number assignment of the mobile radiotelephone a home identification number and at least one extended home identification number, the extended home identification being

used by the same service provider as a home identification in the service area other than the home service area;
operating the mobile radiotelephone to set up a call;
determining if the operating mobile radiotelephone is located in a service area other than the home service area by determining if the home identification number is operative;
searching overhead/control channels of both the A and B band of frequencies if the home identification number is not operative for use as the extended home identification number,
the mobile radio telephone locking onto a channel provided by the same service provider containing the extended home identification number;
the mobile radiotelephone in response to locking operating in a home mode using its home mode telephone number and establishing a call in the service area other than the home area with the service provider used in the home service area.

5,463,676
KEY TELEPHONE SYSTEM WITH A VOICE STORAGE EQUIPMENT

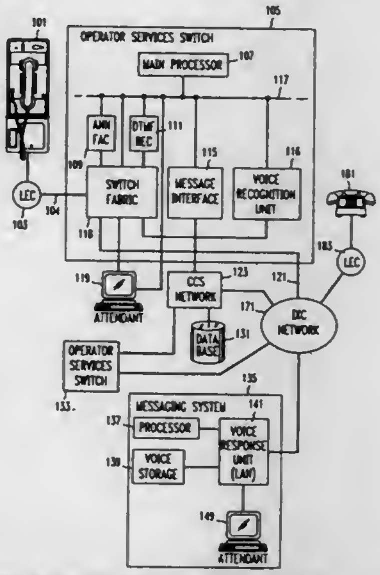
Shigeru Ohsawa, Kanagawa, Japan, assignor to Nitsuko Corporation, Kawasaki, Japan
Continuation-in-part of Ser. No. 754,468, Sep. 4, 1991, abandoned. This application Feb. 22, 1993, Ser. No. 20,837
Claims priority, application Japan, Sep. 4, 1990, 2-092930 U
Int. Cl.^{6} H04M *1/64*
U.S. Cl. 379—67 **5 Claims**



1. A telephone switching system, comprising:
main equipment;
a display panel connected to said main equipment;
a plurality of key sets; and
voice storage equipment in communication with said plurality of key sets via said main equipment and which records and plays back voice mail messages from incoming central office lines and from said plurality of key sets,
means for memorizing at least one voice mail message, sender and receiver phone numbers and a recording time in said voice storage equipment;
means for displaying a status of each recorded voice mail message on a display of each of the plurality of key sets; and
means for displaying a status of each recorded voice mail message on said display panel connected to said main equipment;
wherein said means for memorizing at least one voice mail message in said voice storage equipment comprises a time clock for keeping time, a control for controlling operations of said voice storage equipment, a voice memory for storing voice mail messages, and a directory memory for storing sender and receiver phone numbers and a time of the storing of each voice mail message, the sender phone numbers being phone numbers of originators of said voice mail messages from said incoming central office lines and said plurality of key sets, said receiver phone numbers corresponding to phone numbers of said plurality of key sets for receivers of said voice mail messages, and the time of the storing of each voice mail message being measured by said time clock within said voice storage equipment.

5,463,677
METHOD AND APPARATUS FOR FACILITATING THE MAKING OF COLLECT CALLS

Stephan R. Bash, New York, N.Y.; Salvatore R. L. Di Rubbo, Port Murray, N.J.; Paul F. Gibilisco, Morris Township, Morris County, N.J., and Richard L. Mansdoerfer, Jr., Somerset, N.J., assignors to AT&T Corp., Murray Hill, N.J.
Filed May 27, 1993, Ser. No. 68,355
Int. Cl.^{6} H04M *3/50;7/00*
U.S. Cl. 379—88 **22 Claims**

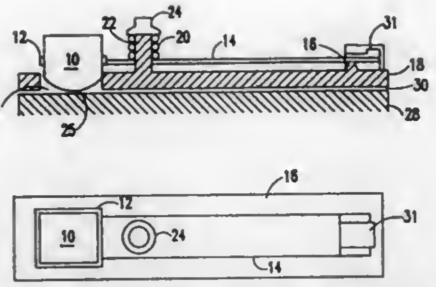


1. Apparatus for use in processing collect calls, comprising:
means for determining that a collect call placed by a caller to a called party is unacknowledged;
means for recording a message from said caller;
means, responsive to a received indication that said called party agrees to pay to receive said message, for supplying said message to said called party, said indication being received from said called party after the conclusion of said collect call; and
means, responsive to said indication, for charging said called party for being supplied with said message.

5,463,678
CREDIT CARD READER

Walter R. Kepley, III, Gaithersburg; Dana J. Greer, Frederick, both of Md., and Richard A. Shields, Jr., Bellevue, Wash., assignors to Claircom Communications Group, Inc., Seattle, Wash.
Filed Mar. 26, 1993, Ser. No. 40,180
Int. Cl.^{6} H04M *11/00;* G06K *7/06*
U.S. Cl. 379—91 **18 Claims**

15. A card reader, comprising:
a first guide plate with an opening therein;
a second guide plate positioned adjacent said first guide plate and separated therefrom by a gap so that said first guide plate and said second guide plate define in combination a card guide in said gap for receiving a card, said card guide being configured so that said card can be moved entirely through said card guide past said opening in said first guide plate;
a cantilevered member pivotally engaged with said first guide plate;
a head for reading said card, said head being positioned on the extending end of said cantilevered member so that said head is positioned in said opening in said first guide plate in a first



position adjacent said second guide plate, wherein said cantilevered member is biased so as to urge said head into said first position; and

a bracket positioned on said first guide plate which defines a cantilevered member retention space between said first guide member and said bracket, wherein said cantilevered member is positioned so that said end of said member opposite said head is positioned and retained in said retention space so that said bracket guides said beam while allowing torsional movement of said head relative said second guide plate member.

5,463,679
PUBLIC TELEPHONE SYSTEM

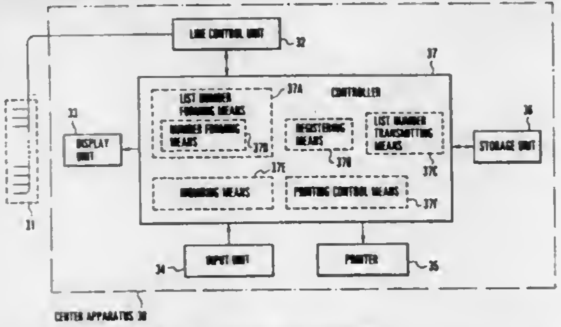
Osamu Kai; Junichi Muroi; Nobuo Suzuki; Tatsumi Takagi, all of Tokyo; Shigekazu Sakata, and Hideyuki Oikawa, both of Saitama, all of, Japan, assignors to Tamura Electrics Works, Ltd., and Kokusai Denshin Denwa Co., Ltd., both of Tokyo, Japan

Filed Apr. 26, 1994, Ser. No. 233,639

Claims priority, application Japan, Apr. 27, 1993, 5-122102; Apr. 27, 1993, 5-122103

Int. Cl.^{6} H04M *17/00;3/00*

U.S. Cl. 379—145 **7 Claims**



1. A public telephone system comprising:

public telephone sets for performing speech communication by using cards assigned with a series of card numbers; and

a center apparatus, connected to said public telephone sets through a telephone line, for managing as invalid card numbers, the card numbers of invalid cards to prevent the speech communication by means of the invalid cards,

said center apparatus comprising

card list forming means for forming a plurality of card lists each having at least one set of upper and lower limit numbers specifying consecutive invalid card numbers, said card list forming means including a list number forming means for assigning card list numbers to sets of the upper and lower limit numbers of a card list, respectively,

management table forming means for forming a management table in which the card list numbers from said card list forming means are associated with management numbers of said telephone sets to which the card list numbers are to be sent,

a storage unit for storing the card list from said card list forming means and the management table from said management table forming means, and

transmitting means for transmitting the corresponding sets of the upper and lower limit numbers to said telephone sets, through the telephone line, in accordance with the management table stored in said storage unit,

each of said public telephone sets comprising

a memory for storing at least one set of the upper and lower limit numbers transmitted by said transmitting means, and

control means for controlling on the basis of the set of the upper and lower limit numbers stored in said memory whether speech communication is allowed in use of the cards.

5,463,680
SWITCHING ARRANGEMENT FOR ACTIVATING ELECTRICAL DEVICES

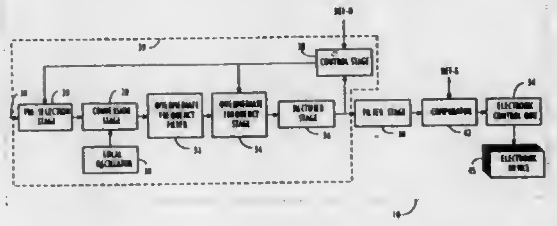
Werner Bidese, Zurich; Hans-Rudolf Fritschi, Wil, and Alfred Grau, Zurich, all of, Switzerland, assignors to Siemens-Albis AG, Zurich, Switzerland

Filed Feb. 15, 1994, Ser. No. 196,474

Claims priority, application Switzerland, Feb. 16, 1993, 00474/93

Int. Cl.^{6} H04M *11/00;1/00*

U.S. Cl. 379—165 **15 Claims**



1. A switching arrangement for activating an electrical device, said switching arrangement comprising:

a comparator that compares an activation signal received on a communication line with a first reference voltage;

an electronic control unit, an output of said comparator being connected to said electronic control unit, said electronic control unit activating at least one of a plurality of terminal devices in response to a predetermined output from said comparator, at least one of said plurality of terminal devices having a transmitter stage connected to said communication line to put said activation signal onto said communication line, said at least one of a plurality of terminal devices being deactivated upon the occurrence of a predetermined event; and

a control loop connected to said comparator to govern input signals to a value of a second reference voltage and selecting time constants of said control loop in such a manner so that activation signals are transferred in a substantially unimpaired manner, wherein said control loop comprises:

a pre-selection stage;

a conversion stage connected to an output of said pre-selection stage;

a local oscillator that is connected to said conversion stage;

an intermediate frequency filter that is connected to an output of said conversion stage;

an intermediate frequency amplifier stage that is connected to an output of said intermediate frequency filter;

a rectifier stage connected to an output of said intermediate frequency amplifier stage; and a control stage that is connected with an output of said rectifier stage, an output of said control stage being connected with a control input of said pre-selection stage and a control input of said intermediate frequency amplifier stage.

5,463,681

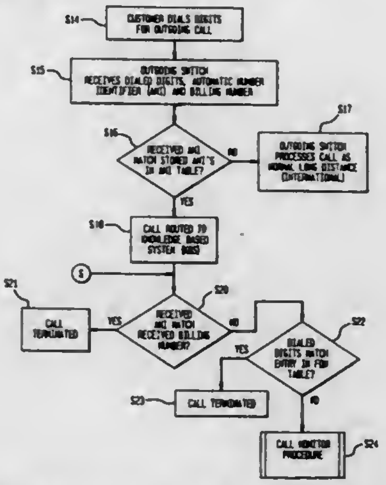
SECURITY SYSTEM FOR TERMINATING FRAUDULENT TELEPHONE CALLS

Christos I. Vaios, Schrewsbury; Alan E. Malinowski, Union, both of N.J., and Dimitri N. Dillani, Aurora, Ill., assignors to AT&T Corp., Murray Hill, N.J.

Filed Dec. 29, 1993, Ser. No. 174,927

Int. Cl.^{6} H04M *1/66*

U.S. Cl. 379—189 **3 Claims**


S14
CUSTOMER DIALS DIGITS FOR OUTGOING CALL
S15
OUTGOING SWITCH RECEIVES DIALED DIGITS, AUTOMATIC NUMBER IDENTIFIER (ANI) AND BILLING NUMBER
S16
RECEIVED ANI MATCH STORED ANI'S IN ANI TABLE?
NO
S17
OUTGOING SWITCH PROCESSES CALL AS NORMAL LONG DISTANCE (INTERNATIONAL)
YES
S18
CALL ROUTED TO KNOWLEDGE BASED SYSTEM (KBS)
S
S21
CALL TERMINATED
YES
S20
RECEIVED ANI MATCH RECEIVED BILLING NUMBER?
NO
S22
DIALED DIGITS MATCH ENTRY IN FDN TABLE?
YES
S23
CALL TERMINATED
NO
CALL MONITOR PROCEDURE
S24

1. A method of determining when a telephone call received by a switch is fraudulent, the telephone call including a destination number, a customer identifier number and a billing number, comprising the steps of:

(a) receiving the destination number, the billing number and the customer identifier number in a first processor of said switch;

(b) comparing the customer identifier number to potential fraudulent customer identifying numbers stored in a first memory of said switch;

(c) processing the telephone call, including the billing number, the customer identifier number and the destination number, by a second processor in a knowledge base system when the customer identifier number matches one of the fraudulent customer identifying numbers in said comparing step (b);

(d) comparing the destination number to fraudulent destination numbers stored in a second memory in the knowledge base system;

(e) terminating the telephone call when the second processor determines that the destination number matches one of the fraudulent destination numbers in said comparing step (d);

(f) when the destination number does not match one of the fraudulent destination numbers in said comparing step (d), monitoring the telephone call to determine whether the telephone call has exceeded one of a predetermined call duration time and a predetermined number of call attempts;

(g) connecting an operator to the telephone call when the telephone call has exceeded one of said predetermined call duration time and said predetermined number of call attempts in said monitoring step (f), said operator

contacting a subscriber financially responsible for the billing number and determining whether the subscriber authorizes the use of the billing number; and

(l) terminating the telephone call when the subscriber refuses to authorize the use of the billing number.

5,463,682

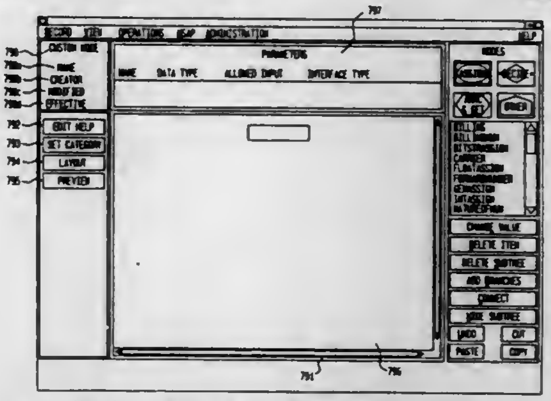
METHOD OF CREATING USER-DEFINED CALL PROCESSING PROCEDURES

Gregory M. Fisher, North Brunswick; Kathleen D. Cebulka, Piscataway; Susan K. Man, Holmdel; Zaher A. Nazif, High Bridge, all of N.J., and Lori J. Vinciguerra, Newtown, Pa., assignors to Bell Communications Research, Inc., Livingston, N.J.

Continuation-in-part of Ser. No. 934,240, Aug. 25, 1992, abandoned. This application Nov. 6, 1992, Ser. No. 972,501

Int. Cl.^{6} H04M *3/42;11/00;15/00;7/00*

U.S. Cl. 379—201 **3 Claims**



1. A method of creating, in response to inputs from an operator of a telecommunications system, a user-defined call processing node for a call processing record containing logically related nodes and branches, the method comprising the steps, executed by a processor of the system, of:

receiving an instruction from the operator to construct a user-defined call processing node;

presenting to said operator, in response to the instruction, a screen with which to construct the user-defined call processing node;

presenting the operator with a plurality of types of predefined nodes;

receiving from the operator selections of predetermined nodes;

arranging said selected predefined nodes into an underlying representation of call processing procedures;

enabling the underlying representation of call processing procedures as a single node for use in creating call processing records; and

requesting the operator to specify parameters for the underlying representation of call processing procedures, said parameters defining call variables for which values can be provided at a later time.

5,463,683

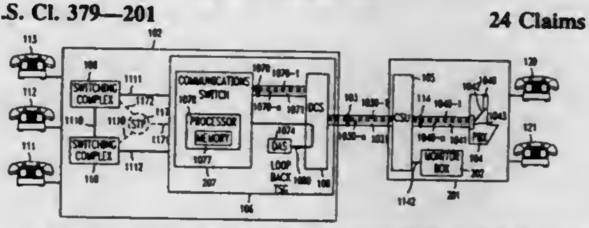
BLOCKED CELL NOTIFICATION SYSTEM

Cynthia B. Collins, Hampton; Young Lee, Edison, and Daniel D. Tagatac, Freehold, all of N.J., assignors to AT&T Corp., Murray Hill, N.J.

Filed Dec. 28, 1993, Ser. No. 174,116

Int. Cl.^{6} H04M *3/00*

U.S. Cl. 379—201 **24 Claims**



1. A system for providing to a communications apparatus connected to a communications network, information associated with a call originated from a device connected to said communications network, and destined for said communications apparatus, said system comprising:

means responsive to said call for searching for an available communications channel in a a facility, said facility a) including a signaling channel and at least one communications channel, and b) providing a link between the communications apparatus and the communications network; and

a delivery means for transmitting to the communications apparatus via the signaling channel of the facility, information associated with said call when no communications channel of the facility is available to route said call to the communications apparatus.

5,463,684

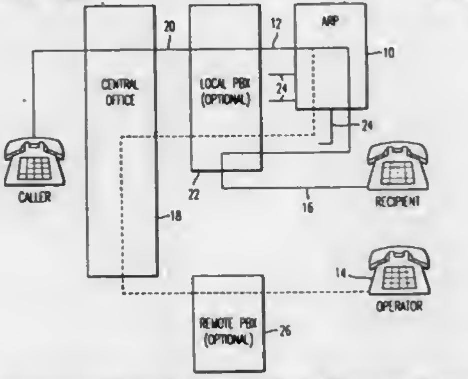
TELECOMMUNICATIONS SYSTEM FOR TRANSFERRING CALLS WITHOUT A PRIVATE BRANCH EXCHANGE

Georg E. Morduch, Alexandria, Va.; Alvin O. Parkinson, and Thomas S. Urso, Jr., both of Gaithersburg, Md., assignors to Microlog Corporation, Germantown, Md.

Filed Nov. 3, 1993, Ser. No. 145,122

Int. Cl.^{6} H04M *3/56*

U.S. Cl. 379—202 **28 Claims**



1. A telecommunications system for establishing a telephone conference between a caller on an incoming telephone line to said system and a called party on an outgoing telephone line from said system without requiring a private branch exchange, comprising;

a programmable processor;

a memory device coupled to said processor comprising a first memory location for storing data relating to said incoming line and a second memory location for storing data relating to said outgoing line; and

interface means for interfacing said processor with said incoming and outgoing lines;

wherein said processor is operable to detect and answer a telephone call on said incoming line to determine the identity of said called party from said caller, to establish a telephone call on said outgoing line by dialing a telephone number corresponding to said called party, and to generate handshaking signals for storage in said first memory location and said second memory location of said memory device corresponding to said incoming and outgoing lines for conferencing said incoming and outgoing lines.

5,463,685

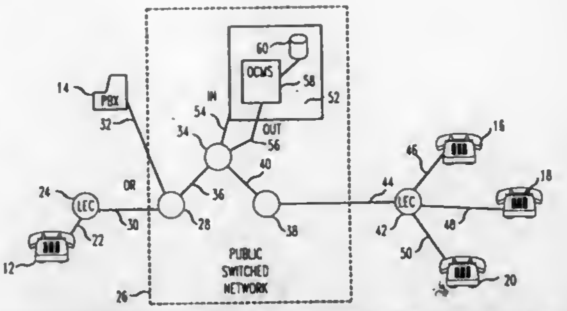
NETWORK BASED OUTBOUND CALL MANAGEMENT

Barbara I. Gaechter, Tinton Falls; Paramdeep S. Sahni, Marlboro, and I. Grace Tseng, Middletown, all of N.J., assignors to AT&T IPM Corp., Coral Gables, Fla.

Continuation of Ser. No. 861,720, Apr. 1, 1992, abandoned. This application Nov. 9, 1994, Ser. No. 336,715

Int. Cl.^{6} H04M *3/42;7/00;3/00;* **H04Q** *3/64*

U.S. Cl. 379—207 **3 Claims**



1. A method of providing outbound call management services in a telecommunications network, comprising the steps of:

storing in the telecommunications network a calling program received from a subscriber of outbound call management services provided by the telecommunications network, a calling program comprising a first list of one or more telephone numbers to be automatically dialed by the telecommunications network and a second list of one or more telephone numbers to which successfully completed automatically dialed telephone calls are to be connected by the telecommunications network;

automatically making a first telephone call to one of the telephone numbers in the first list;

automatically making a second telephone call to one of the telephone numbers in the second list; and

merging the first and second telephone calls.

5,463,686

COMMUNICATION ROUTING METHOD WITH INCOME OPTIMIZATION FOR TELECOMMUNICATION NETWORKS

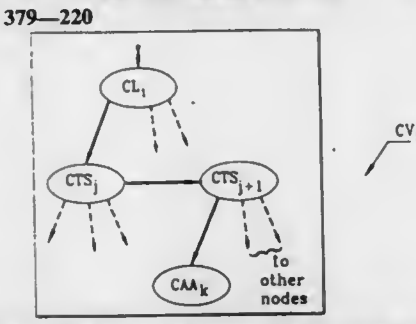
Marc Lebourges, Orgerus, France, assignor to France Telecom, Paris, France

Filed Apr. 13, 1993, Ser. No. 45,390

Claims priority, application France, Apr. 17, 1992, 92 04814

Int. Cl.^{6} H04M *3/36;7/06*

U.S. Cl. 379—220 **3 Claims**



1. A method for routing a communication signal at a switching node of a telecommunication network having a plurality of switching nodes during a set-up procedure of said communication signal, comprising the following steps:

(a) associating a list of routing objects with said switching node, each of said routing objects including five parameters defining a network path from a predetermined origin in said communication network, said parameters including an origin parameter associated with a predetermined origin of said communication signal in said network, a destination parameter associated with a predetermined destination of said communication signal in said network, an upstream path parameter associated with at least one network component upstream of said switching mode, a service parameter associated with at least one network condition necessary for routing said communication signal, and a downstream path parameter associated with a network component downstream from said switching node to said predetermined destination, each of said five parameters being described in a tree-structural form arranged to be constituted by a plurality of levels, each said routing object having a predetermined economic gain-per-communication associated therewith;

(b) transmitting a call set-up message during said set-up procedure, said call set-up message including a first signalling element designating a first call origin and a first call destination of said communication signal, and a second signalling element designating a first upstream path from said first call origin up to said switching node, each of said first and second signalling elements being described in a tree-structural form arranged to be constituted by a plurality of levels;

(c) searching for and identifying routing objects compatible with said call set-up message among said routing objects of said list of routing objects associated with said switching node, said origin, destination and upstream path parameters of each of said compatible routing objects each being described in a tree-structural form having fewer levels than each of the tree-structural forms describing said first and second signalling elements, respectively;

(d) selecting from among said compatible routing objects a routing object having a selected maximum economic gain-per-communication where an economic gain-per-communication for each routing object is defined as an average difference between incomes and costs accounted in real-time depending on charging information for each of all said communications compatible with a particular routing object;

(e) associating logically said communication signal with said selected routing object having a maximum gain-per-communication, so as to route said communication signal along a selected downstream path defined by a downstream path parameter included in said selected routing object, and

(f) updating said economic gain of said selected routing object as a function of charging information associated with routing of said communication signal along said selected downstream path after receiving said call set-up message.

5,463,687

FOLDABLE PORTABLE TELEPHONE WITH CONTROL OF AUDIO CIRCUITRY BASED ON THE FOLDED/UNFOLDED POSITION

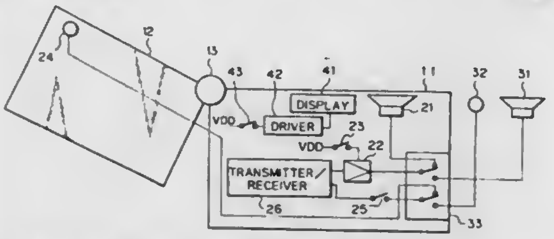
Hiroshi Takizawa, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Jan. 12, 1994, Ser. No. 180,214

Claims priority, application Japan, Jan. 12, 1993, 5-002979

Int. Cl.^{6} H04M *1/00*

U.S. Cl. 379—433 **2 Claims**



1. A foldable portable telephone comprising:

a first box-like casing part accommodating at least a display and a first speaker;

a second box-like casing part accommodating at least a first microphone;

hinge means connecting said first and second casing parts foldably to each other;

detecting means for determining whether or not said first and second casing parts are folded;

switch means for connecting a second speaker and a second microphone to the telephone; and

control means for (a) interrupting, when said first and second casing parts are folded or when said second speaker and said second microphone are connected to said telephone, power supply to said first microphone and said first speaker, (b) for providing power supply to said second speaker and said second microphone when said second speaker and said second microphone are connected to said telephone whether or not said first and second casing parts are folded, and (c) for interrupting power supply to said display when said first and second casing parts are folded.

5,463,688

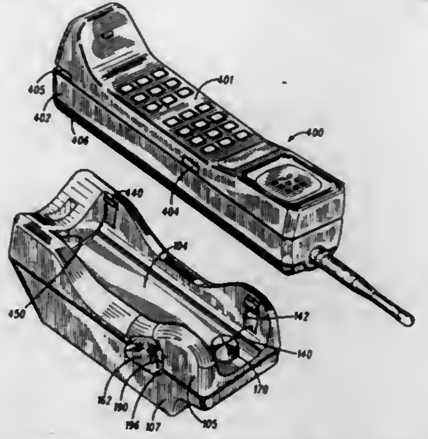
TELEPHONE MOUNTING RECEPTACLE HAVING OPPOSED RETRACTABLE LATCH MEMBERS

Thomas S. Wijas, Northbrook, Ill., assignor to Motorola, Schaumburg, Ill.

Filed May 19, 1994, Ser. No. 246,003

Int. Cl.^{6} H04M *1/00*

U.S. Cl. 379—446 **16 Claims**



1. A mounting receptacle for a telephone, the telephone having a longitudinal dimension and a transverse dimension orthogonal to the longitudinal dimension, the longitudinal dimension being longer than the transverse dimension, the mounting receptacle comprising:

a mounting receptacle housing for accepting a portion of the telephone;

at least two facially opposed openings extending through said mounting receptacle housing, said at least two facially opposed openings being incident to the transverse dimension of said portion of the telephone;

at least two retractable latch members movably disposed within the mounting receptacle, each of said retractable latch members having a portion extending into a respective one of said facially opposed openings; and

a retention panel disposed within the mounting receptacle and coupled behind said at least two retractable latch members for retaining said at least two retractable latch members in said at least two facially opposed openings, said retention panel having at least two opposing integral rigidly elastic flanges, each of said at least two opposing integral rigidly elastic flanges directly contacting a corresponding one of said at least two retractable latch members.

5,463,689

INTERDICTION METHOD AND APPARATUS WITH RANDOM MODE JAMMING

Mark E. Schutte, Sugar Hill; William B. Thatcher, Atlanta, and Lamar E. West, Maysville, all of Ga., assignors to Scientific-Atlanta, Norcross, Ga.

Continuation of Ser. No. 896,515, Jun. 10, 1992, abandoned, which is a continuation-in-part of Ser. No. 476,041, Feb. 6, 1990, abandoned, which is a continuation-in-part of Ser. No. 166,302, Mar. 10, 1988, Pat. No. 4,912,760. This application Sep. 2, 1993, Ser. No. 115,357

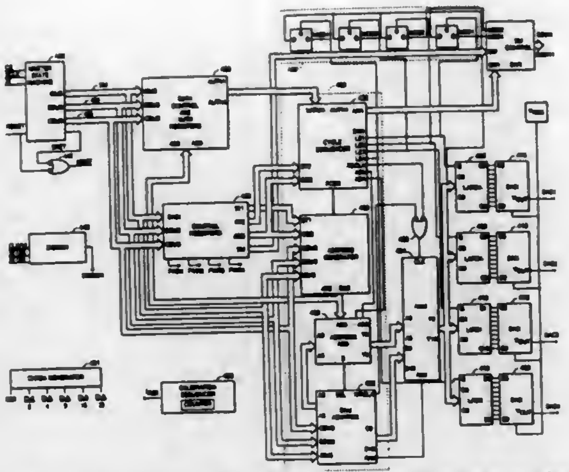
The portion of the term of this patent subsequent to Nov. 23, 2010, has been disclaimed.

Int. Cl.^{6} H04K *1/00*

U.S. Cl. 380—7 **8 Claims**

1. An interdiction apparatus for selectively interdicting unauthorized channel signals in a broadband CATV signal with jamming signals, said apparatus comprising:

means for generating the jamming signals with a plurality of individually programmable time slots forming a jamming cycle, wherein said time slots correspond to frequency control words representative of a desired jamming frequency and



cause a frequency agile oscillator to output said desired jamming frequency during said time slots;

means for controlling said jamming signal generator means to periodically repeat said jamming cycle including means for varying the jamming factor of a channel by assigning a selected number of time slots per channel, and means for varying the sequence by varying the order in which said frequency control words cause said jamming signals; and

means for combining said jamming cycle signals with the broadband CATV signal to interdict the unauthorized channels.

5,463,690

METHOD AND APPARATUS FOR PUBLIC KEY EXCHANGE IN A CRYPTOGRAPHIC SYSTEM

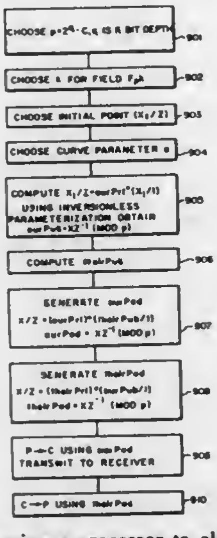
Richard E. Crandall, Portland, Oreg., assignor to Next Computer, Inc., Redwood City, Calif.

Continuation of Ser. No. 955,479, Oct. 2, 1992, Pat. No. 5,271,061, which is a continuation of Ser. No. 761,276, Sep. 17, 1991, Pat. No. 5,159,632. This application Dec. 14, 1993, Ser. No. 167,408

The portion of the term of this patent subsequent to Dec. 14, 2010, has been disclaimed.

Int. Cl.^{6} H04L *9/30*

U.S. Cl. 380—30 **29 Claims**


CHOOSE p=2^q-C, q IS A BIT DEPTH
901
CHOOSE k FOR FIELD F_p^k
902
CHOOSE INITIAL POINT (X_1/Z)
903
CHOOSE CURVE PARAMETER a
904
COMPUTE X_1/Z=ourPri°(X_1/1) USING INVERSIONLESS PARAMETERIZATION OBTAIN ourPub=XZ^-1 (MOD p)
905
COMPUTE theirPub
906
GENERATE ourPad
907
GENERATE theirPad
908
P→C USING ourPad TRANSMIT TO RECEIVER
909
C→P USING theirPad
910

1. A method for using a processor to electronically convert a plaintext message to a ciphertext output for transmission over a transmission medium, said method comprising the steps of:

using an elliptic multiplication means in said processor for performing an elliptic multiplication of a private key and a point, wherein said point is a point on an elliptic curve over a finite field F_pk, where p is one of a class of numbers such that mod p arithmetic is performed in said processor without performing division operations, wherein said elliptic multiplication results in an enciphering key;

using an encryption/decryption means to convert said plaintext message to said ciphertext output using said enciphering key; and

using a transmitting means to transmit said ciphertext output over said transmission medium.

5,463,691

EFFECT IMPARTING APPARATUS HAVING STORAGE UNITS FOR STORING PROGRAMS CORRESPONDING TO FORM AND EFFECT TO BE IMPARTED TO AN INPUT SIGNAL AND FOR STORING OUTPUT FORM PROGRAMS TO DETERMINE FORM OF OUTPUT SIGNAL WITH IMPARTED EFFECT

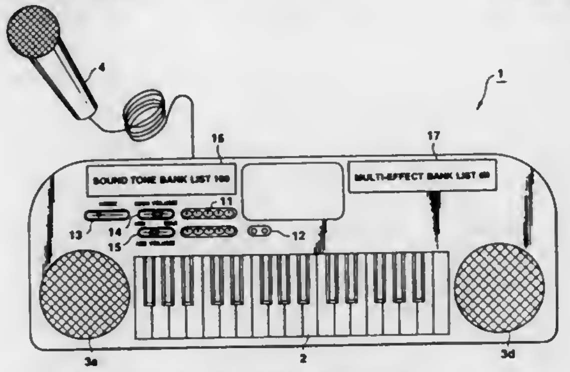
Tetsiochi Nakae, Ome, and Kunihiro Matsubara, Tokyo, both of, Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Filed Oct. 4, 1993, Ser. No. 132,139

Claims priority, application Japan, Jan. 11, 1992, 4-297912; Dec. 15, 1992, 4-354145; Dec. 15, 1992, 4-354146

Int. Cl.^{6} G10H *1/043*

U.S. Cl. 381—61 **20 Claims**



1. An effect imparting apparatus comprising:

a program storage unit for storing a plurality of programs corresponding to a number of effects to be imparted to an input signal which is input to said apparatus;

a selector for externally selecting any one of the programs stored in said program storage unit; and

a signal processor for imparting and outputting an effect to the input signal on the basis of the program selected by said selector, and for outputting the resulting signal;

said program storage unit comprising:

an input form program storage unit for storing a plurality of programs each of which determines a form of imparting an effect to the input signal;

an effect program storage unit for storing a plurality of programs each corresponding to an effect to be imparted to a respective one of the input signals; and

an output form program storage unit for storing a plurality of output form programs which determine a form in which the signal with an imparted effect should be output.

5,463,692

SANDWICH SWITCH CONSTRUCTION FOR A HEARING AID

Ricky L. Fackler, White Bear Lake, Minn., assignor to Resistance Technology Inc., Vadnais Heights, Minn.

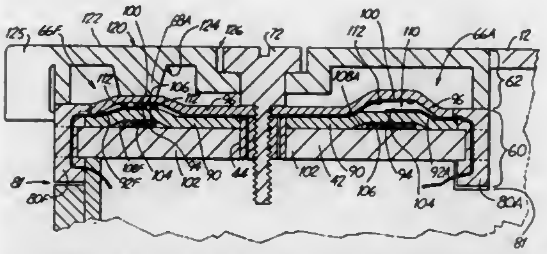
Filed Jul. 11, 1994, Ser. No. 273,200

Int. Cl.^{6} H04R *25/00;* **H01H** *19/58;35/00*

U.S. Cl. 381—68 **12 Claims**

1. A sandwich switch construction for use in a hearing aid, the sandwich switch comprising:

a base surface with a first electrical lead formed thereon, and a deformable elastomeric membrane with a second electrical



lead formed thereon in alignment with the first electrical lead, a portion of the elastomeric membrane being spaced apart from the base surface such that the first electrical lead is not in communication with the second electrical lead; and

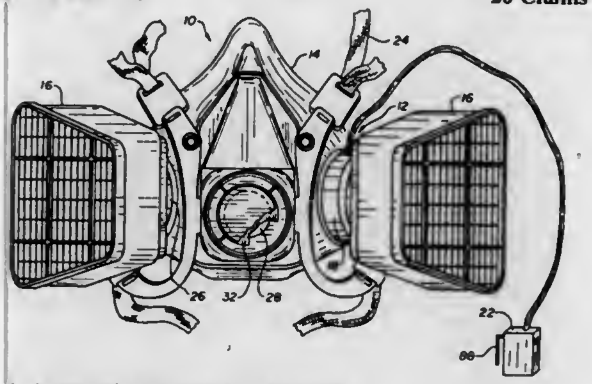
an upper housing rotatably mounted to the base surface, the upper housing having cam contact means fixedly mounted to an underside of the upper housing such that when the upper housing is rotated to a first position the cam contact means contacts and deforms the elastomeric membrane toward the base surface such that the first electrical lead is in electrical communication with the second electrical lead, and such that when the upper housing is rotated to a second position the elastomeric membrane is deformed away from the base surface such that the first electrical lead is not in electrical communication with the second electrical lead.

5,463,693

VOICE AMPLIFICATION ADAPTER ASSEMBLY FOR FACE MASK

Joseph A. Birli, South Euclid, and Jack J. Becker, Solon, both of Ohio, assignors to Audiopack Sound Systems Inc., Cleveland, Ohio

Filed Nov. 10, 1993, Ser. No. 150,380
Int. Cl.^{6} H04R *1/08*
U.S. Cl. 381—75 **20 Claims**



1. A protective respirator, comprising:

a face mask having an inhalation port through which a wearer of the mask inhales ambient air;

an air filter for filtering the inhaled ambient air and providing filtered air to said inhalation port;

a microphone assembly which is removably detachable from a location between said inhalation port and said air filter, said microphone assembly including a spacer for separating said filter from said inhalation port, said spacer having a body with a passage extending the entire length thereof through which filtered air may pass from said filter to said inhalation port, said spacer further having a microphone extending therefrom;

an amplifier connected to said microphone for receiving and amplifying sound transmitted by said microphone and outputting an amplified signal; and

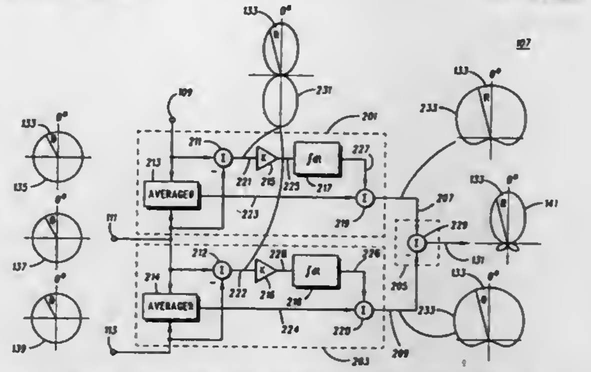
a loudspeaker connected to said amplifier for receiving and radiating said amplified signal.

5,463,694

GRADIENT DIRECTIONAL MICROPHONE SYSTEM AND METHOD THEREFOR

Wayne H. Bradley, Bloomingdale, and Richard E. Werner, Hanover Park, both of Ill., assignors to Motorola, Schaumburg, Ill.

Filed Nov. 1, 1993, Ser. No. 143,609
Int. Cl.^{6} H04R *1/40*
U.S. Cl. 381—92 **16 Claims**



1. A gradient directional microphone system comprising:

no more than three microphones, each of the microphones having a gradient order and a frequency response that is substantially the same, each microphone producing an electrical signal responsive to sound pressure at each microphone, and

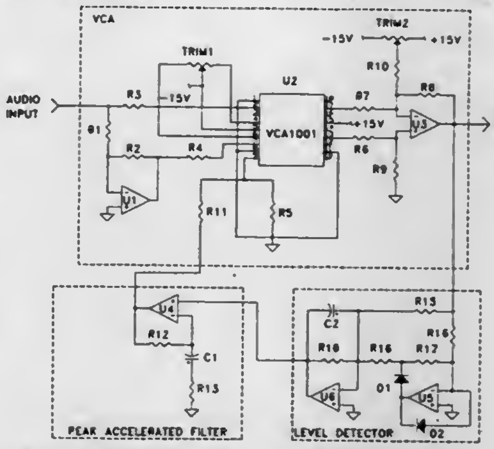
a processor coupled to receive the electrical signal from each microphone and operative to produce an output signal for the gradient directional microphone system having a gradient order at least two gradient orders higher than the gradient order of each of the microphones.

5,463,695

PEAK ACCELERATED COMPRESSOR

Donn Werrbach, Glendale, Calif., assignor to Aphex Systems, Ltd., Sun Valley, Calif.

Filed Jun. 20, 1994, Ser. No. 262,539
Int. Cl.^{6} H03G *7/00*
U.S. Cl. 381—106 **62 Claims**



1. A peak accelerated compressor, comprising:

a. a voltage controlled amplifier circuit coupled between an input signal path and an output signal path for receiving an input audio signal and producing an output audio signal;

b. said voltage controlled amplifier circuit including a phase splitter connected to said input path, a differential amplifier connected to said output path, and a voltage controlled amplifier connected between the phase splitter and the differential amplifier;

c. a level detector circuit coupled to a sample signal path for receiving a sample audio signal which contains transient peaks and average waveforms;

d. said level detector circuit including a rectifier for rectifying said sample audio signal, and a level detector for detecting the level of said sample audio signal;

e. said level detector circuit producing a detector output signal which is fast changing in response to said transient peaks in said sample audio signal, but slow changing in response to said average waveforms in said sample audio signal;

f. a peak accelerated filter circuit coupled between said level detector circuit and said voltage controlled amplifier circuit for receiving said detector output signal;

g. said peak accelerated filter circuit including an operational amplifier and a resistor-capacitor network, the operational amplifier having a non-inverting input for receiving said detector output signal from said level detector circuit, an inverting input, and an output for delivering a control signal to said voltage controlled amplifier circuit, and the resistor-capacitor network connected between the output and the inverting input of the operational amplifier for serving as a high pass filter;

h. said peak accelerated filter circuit producing a control output signal to reduce the gain of said voltage controlled amplifier circuit when said detector output signal is fast changing in response to the transient peaks in the sample audio signal, but maintain the gain of said voltage controlled amplifier circuit when the detector output signal is slow changing in response to the average waveforms in the sample audio signal; and

i. said peak accelerated filter circuit causing a greater relative gain reduction in said voltage controlled amplifier circuit for said transient peaks but a less relative gain reduction for said average waveforms;

j. whereby the peak accelerated compressor effectively enhances the compression for transient peaks without adversely affecting the normal compression of average waveforms.

5,463,696

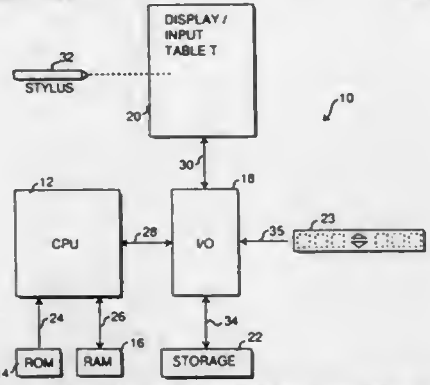
RECOGNITION SYSTEM AND METHOD FOR USER INPUTS TO A COMPUTER SYSTEM

Ernest H. Beernink, San Carlos; Giulia Pagallo, Cupertino, and Radmilo Bozinovic, San Jose, all of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.

Continuation of Ser. No. 889,216, May 27, 1992, abandoned. This application Jul. 5, 1994, Ser. No. 270,405

Int. Cl.^{6} G06K *9/00*

U.S. Cl. 382—186 **6 Claims**



1. A system for recognizing user input to a computer from a user input device, comprising:

- input means for receiving user input data in the form of a signal from a user input device chosen from the group consisting essentially of a tablet input device and a voice input device;
- means for storing said user input data in memory of said computer system;
- a hierarchy of independent recognition domains, each of said hierarchy of independent recognition domains comprising group means and classify means, including:
  - a first recognition domain for receiving a portion of said user input data as a first recognition domain input and performing character-related recognition on the user input data only if the user input data is of the type expected in a screen recognition area and generating one or more active character-related hypotheses, each of said active character-related hypotheses comprising a portion of said user input data together with a character-related interpretation of said user input data;
  - a second recognition domain for receiving at least one of said active character-related hypotheses as a second recognition domain input and performing word-related recognition on the user input data only if the user input data is of the type expected in said screen recognition area and generating one or more active word-related hypotheses, at least one of said active word-related hypotheses being derived from said one of said active character-related hypotheses;
  - a third recognition domain for receiving a portion of said user input data as a third recognition domain input and performing shape part recognition on the user input data only if the user input data is of the type expected in said screen recognition area and generating one or more active shape-pan-related hypotheses, each of said shape-part-related hypotheses comprising a portion of said user input data together with a shape-part-related interpretation of said user input data; and
  - a fourth recognition domain for receiving at least one of said active shape-part-related hypotheses as a fourth recognition domain input and performing shape recognition on the user input data only if the user input data is of the type expected in said screen recognition area and generating one or more active shape-related hypotheses, at least one of said active shape-related hypotheses being derived from said one of said active shape-part-related hypotheses;
- means for storing said active hypotheses in a database comprising a piece pool and a unit pool in said memory of said computer system;
- a control unit including:
  - first control means for managing the means for storing active hypotheses, said first control means further including means for removing a previously stored hypothesis from said database, said means for removing further removes a hierarchy of hypotheses from which said previously stored hypothesis is derived, down to constituent strokes as well all other hypotheses in said database that refer to said constituent strokes; and
  - second control means for scheduling the recognition tasks in said recognition domains;
- arbiter means for resolving multiple active hypotheses from said recognition domains and choosing a recognition result among said multiple active hypotheses from said recognition domains; and
- a user output device for communicating to said user said recognition result.

5,463,697

APPARATUS FOR DETECTING AN EDGE OF AN IMAGE

Masataka Toda, Toyohashi, and Hiroyuki Suganuma, Nagoya, both of, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Aug. 4, 1993, Ser. No. 101,734

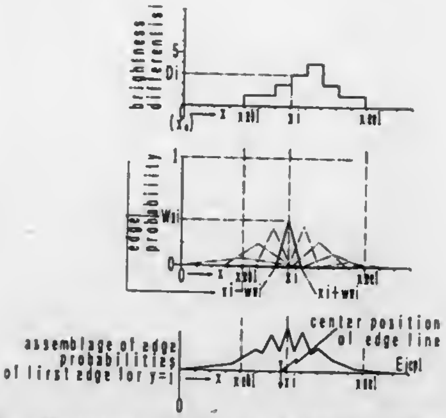
Claims priority, application Japan, Aug. 4, 1992, 4-208101

Int. Cl.^{6} G06K *9/48*

U.S. Cl. 382—199 **5 Claims**

1. An apparatus for detecting an edge center of an object comprising:

- camera means for taking a picture of the object and generating an analog image signal which represents a brightness of an image on individual picture elements, wherein the individual picture elements form a two dimensional matrix with an x dimension and a y dimension;



an A/D converter for converting the analog image signal to digital image data according to a gray scale;

memory means for storing at least the digital image data;

means for calculating differential data which corresponds to the digital image data between each of the individual picture elements which are adjacent to each other in a direction of the x dimension;

means for converting the differential data corresponding to each of the individual picture elements that are located in a selected region within an edge zone defined in the direction of the x dimension into an index value for each of a plurality of indices such as small, medium and high;

means for converting each index value for each of the individual picture elements that are located in the selected region into at least one edge value and calculating at least one preliminary resultant center position from at least one of the edge values; and

means for weighing an x position of the x dimension of each of the individual picture elements in the selected region based on at least one of the preliminary resultant center positions and calculating a subsequent center position based on the weighted x positions of the individual picture elements in the selected region, wherein the subsequent center position is the edge center of the object in the x dimension.

5,463,698

METHOD FOR THE PROCESSING OF IMAGES BY HIERARCHICALLY ORGANIZED QUEUES

Fernand Meyer, Veneux les Sablons, France, assignor to Association pour la Recherche et le Development des Methodes et Processus Industriels (Armines), Paris, France

PCT No. PCT/FR92/00247, § 371 Date Dec. 29, 1993, § 102(e) Date Dec. 29, 1993, PCT Pub. No. WO92/16908, PCT Pub. Date Jan. 10, 1992

PCT Filed Mar. 19, 1992, Ser. No. 119,126

Claims priority, application France, Mar. 20, 1991, 91 03384

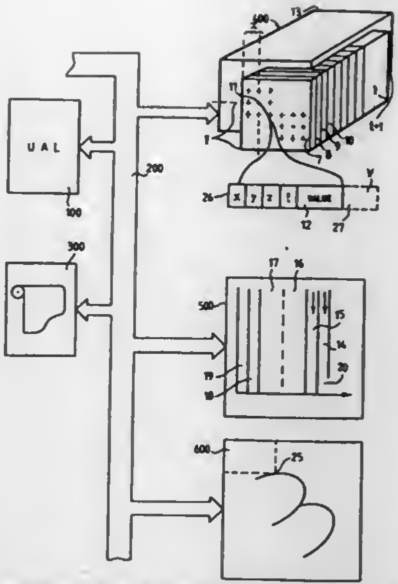
Int. Cl.^{6} G06K ***9/62***

U.S. Cl. 382—276 **21 Claims**

1. A method for processing an image stored in a memory containing, at each picture element address, a physical value of a physical element of a body associated with each picture element and a marker value associated with each said picture element used to obtain a physical image and a marker image, said method comprising an initialization phase and a processing phase, and being aimed at the construction of a result image, wherein in the initialization phase:

a hierarchically organized group of queues HOQ, is created, the queues of this group being of the first-in-first-out type and being differentiated from one another according to an order of priority determined by their correspondence with one value among the possible values of a priority parameter,

in at least one of the physical image and the marker image, picture elements for initiating the method are identified,



a level of priority of each initiating picture element is assessed as a function of the physical and marker values associated with the picture element or neighboring elements of the picture element,

the address of each initiating picture element is stored in a queue that corresponds to the level of its priority,

in the processing phase, steps 1 and 2 are repeated so long as the HOQ is not empty:

step 1: the address of the picture element with the highest priority is extracted from the queue with the highest priority that is undergoing processing, x designating this picture element,

step 2: neighbors of x are put on a neighborhood list of x, for each neighbor, y, of x that is found in said neighborhood list of x and that has never yet been stored in the HOQ during the processing phase, the level of priority of y is assessed as a function of its physical value or of physical values of picture elements of a neighborhood of y, the address of y is stored in the HOQ that corresponds to this level of priority, and x is given, in the result image memory, a label depending on its window.

5,463,699

DATA COMPRESSION

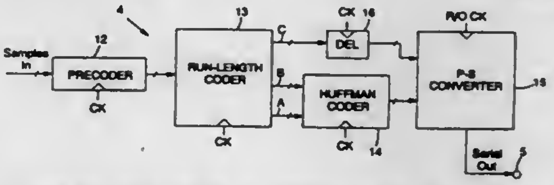
James H. Wilkinson, Tadley, United Kingdom, assignor to Sony United Kingdom Limited, Staines, United Kingdom

Filed Oct. 28, 1993, Ser. No. 141,996

Claims priority, application United Kingdom, Feb. 5, 1993, 9302281

Int. Cl.^{6} G06K ***9/36***

U.S. Cl. 382—246 **12 Claims**



1. Apparatus for reducing the quantity of data needed to represent an input stream of data sample signals, each of said signals representing video image data, possible input sample values being notionally divided into groups each containing a number of sample values equal to a respective power of two, the apparatus comprising:

means for generating a code word for at least each non-zero value input sample signal such that the code words for sample signals with values in each group have a most significant bit signal of one type in the same position, which position is different for different groups, the sequence of bit signals of lower order than said most significant bit signal being different in code words for sample signals with different values in the same group;

a run-length counter for generating a run-length count dependent upon the number of sample signals in a run of zero value input sample signals terminated by a non-zero value sample signal;

means for generating a position indicator signal indicating the position of said most significant bit signal of one type in the code word for the non- zero value sample signal terminating the run; and

means for extracting the sequence of bit signals of lower order than said most significant bit signal in that code word.

5,463,700

IMAGE PROCESSING APPARATUS WITH COMPRESSION ERROR DETECTOR

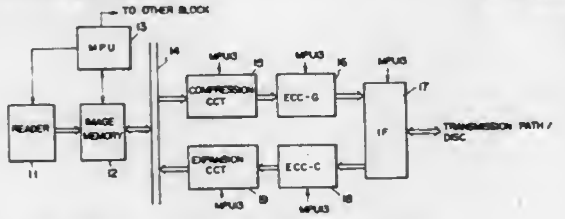
Tamotsu Nakazawa, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 161,870, Dec. 6, 1993, abandoned, which is a continuation of Ser. No. 65,028, May 24, 1993, abandoned, which is a continuation of Ser. No. 860,602, Mar. 30, 1992, abandoned, which is a continuation of Ser. No. 560,291, Jul. 27, 1990, abandoned, which is a continuation of Ser. No. 138,964, Dec. 29, 1987, abandoned. This application Jun. 29, 1994, Ser. No. 267,308

Claims priority, application Japan, Jan. 14, 1987, 62-6355; Jun. 10, 1987, 62-144960; Jun. 10, 1987, 62-144961

Int. Cl.⁶ G06K *9/36;* G01R *31/28;* G06F *11/00*

U.S. Cl. 382—232 **41 Claims**



1. An image processing apparatus comprising:

generating means for generating image data;

first compression means for compressing image data;

second compression means for compressing image data by the same method as said first compression means;

comparing means for comparing a compression result obtained by said first compression means compressing the image data generated by said generating means with a compression result obtained by said second compression means compressing the image data generated by said generating means;

determining means for determining whether or not a compression operation performed by said first compression means is normal, on the basis of a comparison result of said comparing means;

output means for outputting data compressed by said first compression means; and

inhibition means for inhibiting operation of said output means when said determining means determines that the compression operation is abnormal.

5,463,701

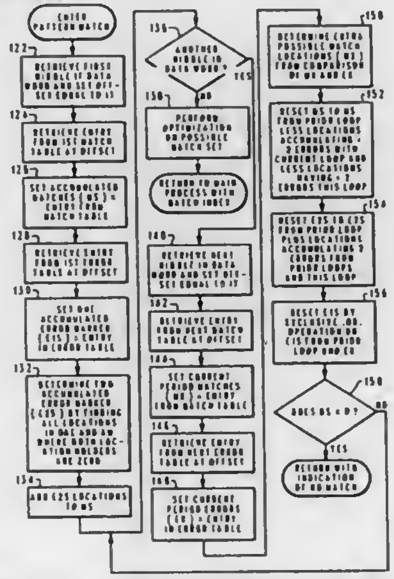
SYSTEM AND METHOD FOR PATTERN-MATCHING WITH ERROR CONTROL FOR IMAGE AND VIDEO COMPRESSION

Robert F. Kantner, Jr., Boca Raton, Fla.; Vaughn S. Iverson, Seattle, Wash.; Kenneth Morse, South Hampton, United Kingdom; Mark A. Pietras, Boynton Beach, Fla., and Arturo A. Rodriguez, Belmont, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 963,367, Oct. 20, 1992. This application Jan. 18, 1994, Ser. No. 183,109

Int. Cl.⁶ G09K *9/36*

U.S. Cl. 382—166 **22 Claims**


ENTER PATTERN MATCH
122
124
126
128
130
132
134
136
ANOTHER NIBBLE IN DATA WORD?
YES
NO
138
PERFORM OPTIMIZATION ON POSSIBLE MATCH SET
RETURN TO MAIN PROCESS WITH MATCH INDEX
140
142
144
146
148
150
152
154
156
158
DOES MS = 0?
YES
NO
RETURN WITH INDICATION OF NO MATCH

1. A method within a data processing system of compressing an image frame having a plurality of pixels assigned digitized color and luminance data, the method comprising the data processing system implemented steps of:

dividing the image frame within said data processing system into a plurality of non-overlapping elementary units, each elementary unit comprising a plurality of pixels;

retrieving an elementary unit having pixels with differing digitized color and luminance data for pattern matching;

assigning each pixel of a retrieved elementary unit a pattern value, which is the same for all pixels sharing a color and luminance value in the elementary unit;

providing a sequence of associated sets of pattern match and error condition tables within said data processing system;

grouping pattern values into offsets into each associated set of pattern match tables and error condition tables;

accumulating entries from the offsets into each associated set of pattern match and error condition tables to generate indicia of pattern matches;

comparing the indicia from the accumulating step to locate a pattern which best matches the pattern value assignments for the elementary unit within a preselected error tolerance;

generating a code for inclusion in a compressed video stream identifying the pattern and including the color and luminance values for the retrieved elementary unit; and

storing said compressed video stream.

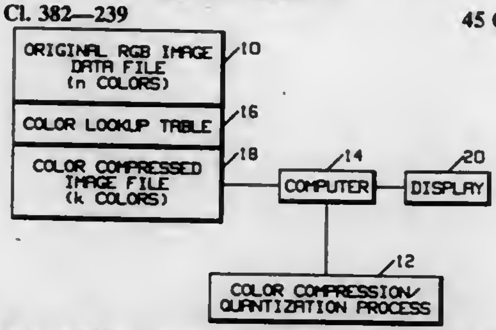
5,463,702
PERCEPTUAL BASED COLOR-COMPRESSION FOR RASTER IMAGE QUANTIZATION

John W. Trueblood, San Diego, Calif., assignor to Sony Electronics Inc., Park Ridge, N.J.

Continuation of Ser. No. 881,917, May 12, 1992, abandoned. This application Jul. 14, 1994, Ser. No. 275,195

Int. Cl.^{6} H04N ***7/12***

U.S. Cl. 382—239 **45 Claims**


ORIGINAL RGB IMAGE DATA FILE (n COLORS)
10
COLOR LOOKUP TABLE
16
COLOR COMPRESSED IMAGE FILE (k COLORS)
18
14
COMPUTER
20
DISPLAY
12
COLOR COMPRESSION/ QUANTIZATION PROCESS

1. In a computer system which displays images as an array of pixels on a display device, a method of color-compression for reducing the number of pixel colors in a digitized image represented by n colors to produce a color compressed image represented by k colors where k<n, comprising the steps of:

selecting a collection of k colors to represent said digitized image such that no two colors c1 and c2 of said k colors are closer together than a predetermined distance d(c1,c2), where d(c1,c2) is defined by:

$$d(c1,c2)=\sqrt{(Wr\Delta R)^2+(Wg\Delta G)^2+(Wb\Delta B)^2}$$

with:

ΔR=the distance between the red components of c1 and c2,

ΔG=the distance between the green components of c1 and c2,

ΔB=the distance between the blue components of c1 and c2,

Wr=red weighting factor for human color perception of red,

Wg=green weighting factor for human color perception of green,

Wb=blue weighting factor for human color perception of blue;

assigning each of said n colors to one of said k colors to produce said compressed image; and

storing a representation of said compressed image in a computer storage device.

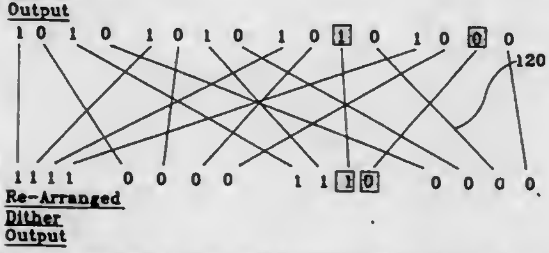
5,463,703
DITHER PICTURE DATA PRE-COMPRESSION PROCESSING METHOD

Bob Lin, No. 9, Lane 102, San Min Rd., Taipei, Taiwan, Prov. of China

Filed Feb. 10, 1994, Ser. No. 194,581

Int. Cl.^{6} G06K ***9/38;*** **H04N** ***1/419***

U.S. Cl. 382—251 **1 Claim**



1. In a method of processing a document after scanning in order to improve run-length coding efficiency, comprising the steps of:

binarizing the document by comparing the data in a scan line with corresponding values in a line of a dither matrix to obtain a dither output,

the improvement comprising the step of:

re-arranging the dither output before compression by grouping together those bits of the dither output obtained by said comparing with a first element of the dither matrix into a first group, grouping together those bits of the dither output obtained by said comparing with a second element of the dither matrix into a second group, and continuing said grouping for each element of said dither matrix, until all of the bits of the dither output have been thus grouped.

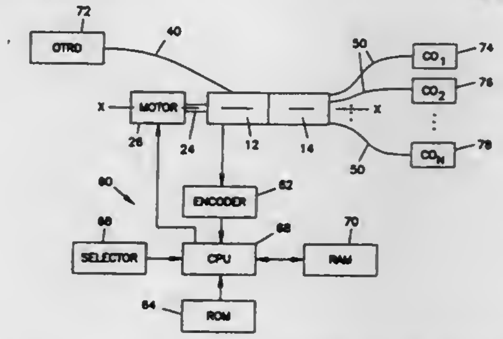
5,463,704
FIBER OPTIC SWITCH

Robert J. Ziebol, Blaine, Minn., assignor to ADC Telecommunications, Inc., Minneapolis, Minn.

Filed May 16, 1994, Ser. No. 243,192

Int. Cl.^{6} G02B ***6/35***

U.S. Cl. 385—22 **6 Claims**



1. A switch for switching optical coupling between at least a first optical fiber and a plurality of second optical fibers, said switch comprising:

a first optical fiber having a terminal end;

first means for mounting said first optical fiber with said terminal end generally parallel and spaced from an axis of rotation by a distance;

a plurality of second optical fibers each having a terminal end;

second means for mounting said plurality of second optical fibers with said terminal ends of said plurality generally parallel and spaced from said axis of rotation by said distance and with said plurality and said first optical fiber relatively rotatable about said axis, said plurality further positioned for said terminal ends of each of said plurality to individually oppose and optically couple with said terminal end of said first optical fiber as said plurality and said first optical fiber are rotated relative to one another about said axis of rotation;

motive power means for urging said first optical fiber and said plurality to rotate relative to one another about said axis;

each one of said plurality having an optimum position of rotation relative to said first optical fiber for a signal power transmission between said each one and said first optical fiber to be maximized at said optimum position;

said motive power means including control means for rotating said plurality relative to said first optical fiber to any selected one of said optimum position;

said control means include electronic storage means for storing a value associated with each of said optimum positions and detection means for determining when said motive power means has rotated said plurality to a desired one of said optimum positions.

5,463,705

OPTICAL WAVEGUIDE ISOLATION

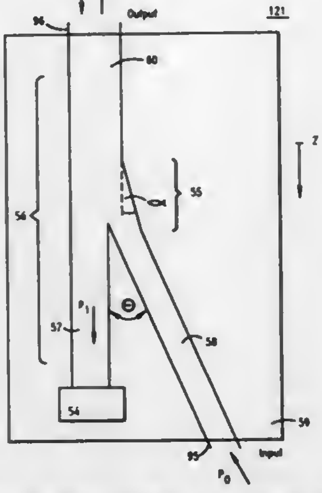
Rolf Clauberg, Gattikon; Christoph Harder, Zurich; Christan Heusch, Adliswil, and Heinz Jaeckel, Kilchberg, all of, Switzerland, assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 126,417, Sep. 27, 1993, abandoned. This application Aug. 10, 1994, Ser. No. 288,639

Claims priority, application European Pat. Off., Nov. 24, 1992, 92810911

Int. Cl.^{6} G02B *6/12*

U.S. Cl. 385—14 **17 Claims**



1. An Optical waveguide isolator (**121**) with an optical input port (**95**) and an output port (**96**) comprising:

optical absorber means (**54**) for receiving light without reflecting it, and

an optical branching waveguide coupler (**56**) having a waveguide stem (**60**) being splitted at its first end into two waveguide branches (**57,58**),

both arranged such that the second end of said waveguide stem (**60**) forms said optical output port (**96**), and a first of said two waveguide branches (**58**) forms said optical input port (**95**), said optical absorber means (**54**) either being an integral part of the second waveguide branch (**57**) or being attached to it, said first waveguide branch being at an angle θ to said waveguide stem such that most of a light wave travelling from said output port (**96**) in the waveguide stem (**60**), is coupled into said second waveguide branch (**57**) and guided to said optical absorber means (**54**), said optical absorber means ensuring that no back reflection occurs.

5,463,706

LIGHT TRACEABLE TRANSMISSION CONDUIT ASSEMBLY

Kenneth R. Dumont, Collierville; Andrew J. O'Neill, Cordova, and Scott T. Davies, Germantown, all of Tenn., assignors to Thomas & Betts Corporation, Memphis, Tenn.

Filed Feb. 16, 1994, Ser. No. 197,026

Int. Cl.^{6} G02B *6/26*

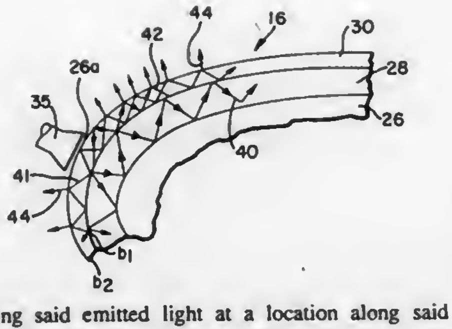
U.S. Cl. 385—32 **7 Claims**

1. A method of tracing a single transmission conduit among a bundle of similar transmission conduits, comprising the steps of:

providing an elongate transmission conduit having an elongate light transmissive jacket surrounding said conduit, said jacket including optical means for transmitting light along the length of said jacket and for emitting light exteriorly from the jacket along the length thereof;

bending said transmission conduit inclusive of said jacket at one portion thereof;

injecting light into said bent one portion of said jacket for transmission along the length of said jacket and for emission exteriorly from said jacket; and



observing said emitted light at a location along said jacket spaced from said bent one portion thereof.

5,463,707

OPTICAL FIBER RECEPTACLE AND METHOD OF PRODUCING THE SAME

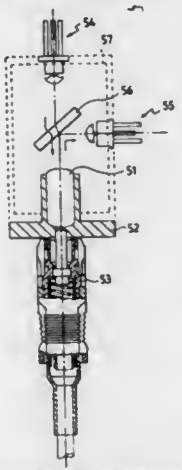
Naotaro Nakata; Naofumi Aoki, both of Kyoto, and Kenji Okada, Tokyo, all of, Japan, assignors to Rohm Co., Ltd., Kyoto, and Nippon Telegraph & Telephone Corporation, Tokyo, both of, Japan

Filed Aug. 24, 1994, Ser. No. 295,453

Claims priority, application Japan, Aug. 25, 1993, 5-210655

Int. Cl.^{6} G02B *6/42*

U.S. Cl. 385—35 **6 Claims**



1. An optical fiber receptacle, comprising:

a glass rod lens provided on one end side of said receptacle so that a front end of an optical fiber to be connected to the other end side of said receptacle is brought into physical contact with a spherical surface of said glass rod lens to thereby make said optical fiber optically couple with an optical element to be provided at a side of said glass rod lens;

a sleeve into which the front end of said optical fiber is to be inserted;

a housing including said sleeve; and

a lens holder to which said glass rod lens is fixedly attached in a condition that a center axis of said sleeve and a center of said spherical surface of said glass rod lens are aligned.

4. A method of producing an optical fiber receptacle having a glass rod lens provided on one end side of said receptacle so that a front end of an optical fiber to be connected to the other end side of said receptacle is brought into physical contact with a spherical surface of said glass rod lens to thereby make said optical fiber optically couple with an optical element to be provided at a side of said glass rod lens, said method comprising the steps of:

inserting a ferrule having a center hole into a sleeve provided in a center portion of a housing;

making a laser beam pass through said center hole of said ferrule;

positioning a laser light source and said housing so that a quantity of transmitted light is maximized;

removing said ferrule from said sleeve;

observing a reflection spot of said laser beam while a lens holder fixedly holding said glass rod lens is gripped by a chuck which is finely adjustable and rotatable in a plane perpendicular to said laser beam and while said lens holder is rotated in a condition that it is made to abut against said housing;

repeating adjustment of a position of said lens holder so that a small circle drawn by said reflection spot is reduced like a point; and

fixing said lens holder to said housing by welding at a position at which said reflection spot draws a point.

5,463,708

OPTICAL WAVEGUIDE MODULE HAVING A WAVEGUIDE AFFIXED THERETO AT A FIRST BONDING STRENGTH AND OPTICAL FIBERS AFFIXED THERETO AT A SECOND BONDING STRENGTH

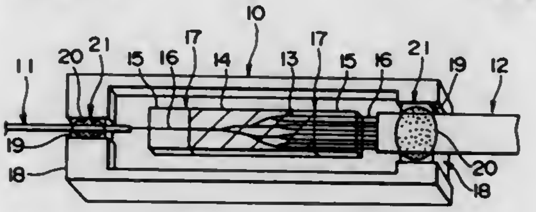
Dai Yui; Hiroshi Suganuma; Shinji Ishikawa, and Shigeru Semura, all of Yokohama, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jun. 22, 1994, Ser. No. 264,357

Claims priority, application Japan, Jun. 22, 1993, 5-150739

Int. Cl.^{6} G02B *6/00;6/36*

U.S. Cl. 385—49 **38 Claims**



1. An optical waveguide module comprising:

a module unit including:

- a waveguide substrate on which an optical waveguide is formed; and
- a fiber connector fixed on an end surface of said waveguide substrate for holding an optical fiber at an end surface thereof;

a housing having a guide part through which the optical fiber is led to an exterior of said housing, said fiber being fixed to said housing at said guide part, said housing accommodating said module unit,

a first bonding agent for fixing said optical fiber to said housing to thereby form a first fixing part between said optical fiber and said housing; and

a second bonding agent for fixing the end surface of said waveguide substrate to the end surface of said fiber connector to thereby form a second fixing part between the end surface of said waveguide substrate and the end surface of said fiber connector;

wherein a fixing strength of said bonding agent in said first fixing part is larger than the fixing strength of said second bonding agent in said second fixing part.

5,463,709

END-FACE POLISHED FERRULE AND ITS METHOD OF MANUFACTURE

Kazuhiko Terao; Hidetoku Iida; Takeyasu Nakayama; Toshiya Kubo; Jiro Horigome, all of Nagano; Yoshihiro Matsuoka, Chiba; Nobutoshi Takeda, Chiba, and Tohru Mizuhashi, Chiba, all of, Japan, assignors to Totoku Electric Co., Ltd., and Emit Seiko Co., Ltd., both of Tokyo, Japan

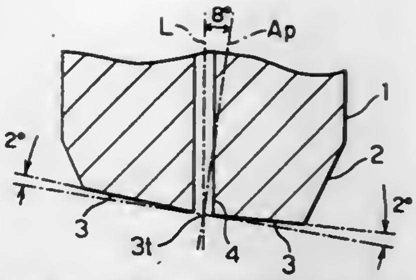
Filed Oct. 3, 1994, Ser. No. 317,072

Claims priority, application Japan, Dec. 10, 1993, 5-310266

Int. Cl.^{6} G02B *6/36;6/25*

U.S. Cl. 385—85 **9 Claims**

1. An end-face polished ferrule, polished to form a conical surface at the end face, such that;



central axis of said conical surface makes an inclination of θ° with respect to an axis of a optical fiber insertion hole, the top of said conical surface coincides with said axis of optical fiber insertion hole and has a taper angle of α°.

7. A method of manufacturing an end-face polished ferrule, wherein;

a spindle rotates around an axis of rotation which makes an angle of α° with respect to a line vertically erected on a plane polishing surface, and retains a ferrule with unpolished end face wherein an axis of a optical fiber insertion hole of said ferrule makes an inclination of θ° with respect to said axis of rotation,

unpolished end face of said ferrule is brought into contact with said polishing surface and polished into a conical surface until the axis of optical fiber insertion hole of the ferrule coincides with the top of said conical surface.

5,463,710

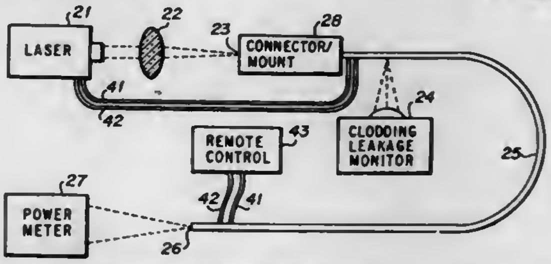
LASER - OPTICAL FIBER TUNING AND CONTROL SYSTEM

David M. Filgas, Walnut Creek; Gordon M. McFadden, Danville; Jeffrey Broome, Livermore, all of Calif., and James F. York, Tempe, Ariz., assignors to Hobart Laser Products, Inc., Livermore, Calif.

Filed Sep. 9, 1992, Ser. No. 942,637

Int. Cl.^{6} G02B *6/36*

U.S. Cl. 385—90 **6 Claims**



1. An apparatus for optimizing coupling of laser radiation into a transmission optical fiber comprising:

(a) a transmission optical fiber;

(d) a laser radiation source for providing laser radiation to the input end of the transmission optical fiber;

(c) first means for monitoring radiation leakage from the transmission optical fiber;

(d) means for adjusting positioning of the laser radiation into the transmission optical fiber to minimize the amount of radiation leakage from the transmission optical fiber detected by the first radiation leakage monitor;

(e) second means for monitoring radiation leakage from the transmission optical fiber positioned near the output end of the transmission optical fiber; and

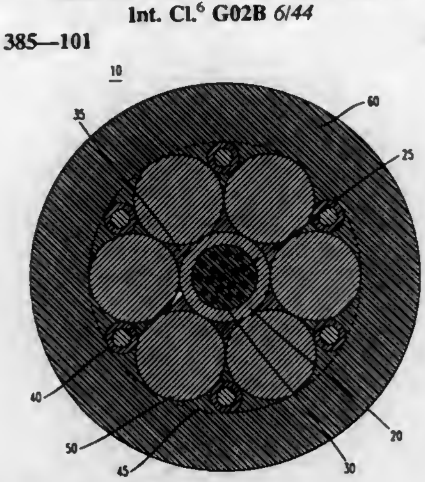
(f) control means for automatically stopping input of the laser radiation source to the transmission optical fiber when the second radiation leakage monitor indicates that laser radiation input to the transmission optical fiber is not reaching the output end of the transmission optical fiber.

5,463,711
SUBMARINE CABLE HAVING A CENTRALLY LOCATED TUBE CONTAINING OPTICAL FIBERS

Tek-Che Chu, Morganville, N.J., assignor to AT&T IPM Corp., Coral Gables, Fla.

Filed Jul. 29, 1994, Ser. No. 282,355
Int. Cl.^{6} G02B *6/44*

U.S. Cl. 385—101 **38 Claims**



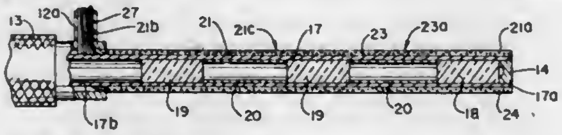
1. An optical fiber cable, comprising:
a longitudinally extending central tube;
six cylindrically-shaped longitudinally extending steel strength members helically wound around said longitudinally extending central tube in a substantially close fitting manner, wherein said longitudinally extending central tube and each of said cylindrically-shaped longitudinally extending steel strength members have substantially identical outside diameters, so as to form a single layered shell;
at least one optical fiber disposed within said longitudinally extending central tube; and
a water-blocking material disposed in interstices between said cylindrically-shaped longitudinally extending strength members and said longitudinally extending central tube.

5,463,712
FIBEROPTIC CASING FOR ENDOSCOPES AND METHOD OF MAKING

Charles D. Cawood, 11527 N. Lou Al Ct., Houston, Tex. 77024

Filed Dec. 5, 1994, Ser. No. 349,247
Int. Cl.^{6} G02B *23/26*

U.S. Cl. 385—117 **31 Claims**



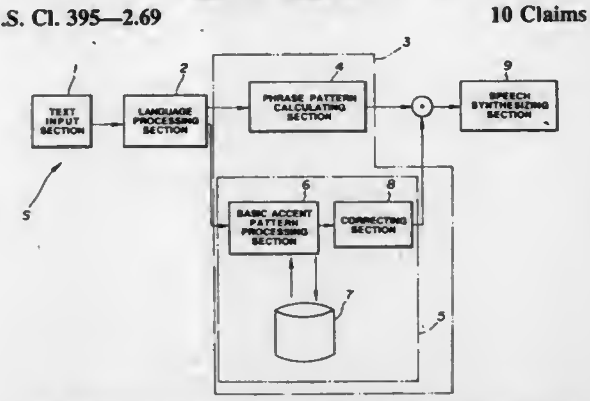
1. An endoscope comprising:
a lens train having proximal and distal ends with an eyepiece lens assembly at said proximal end and at least one field lens at said distal end, said lens train including objective and relay lens means for producing images and transmitting the same from said at least one field lens to said eyepiece assembly;
a tubular outer casing concentric with and extending along said lens train and including a woven cylindrical sheath composed of a plurality of interwoven spirally-extending fiberoptic bundles, each bundle including at least one fiberoptic cable, and bonding means for interlocking said fiberoptic bundles together;
said woven sheath having a proximal end which extends transversely outward from said lens train and forms a light-receiving post for receiving and transmitting light through each of said fiberoptic cables and having a distal end which includes exposed distal ends of said fiberoptic cables positioned about a periphery of said at least one field lens for illuminating an adjacent field.

5,463,713
SYNTHESIS OF SPEECH FROM TEXT

Kazsuya Hasegawa, Tokyo, Japan, assignor to Kabushiki Kaisha Meidensha, Tokyo, Japan

Continuation of Ser. No. 877,782, May 4, 1992, abandoned.
This application Apr. 21, 1994, Ser. No. 232,438
Claims priority, application Japan, May 7, 1991, 3-101105
Int. Cl.^{6} G10L *9/00*

U.S. Cl. 395—2.69 **10 Claims**


1
TEXT INPUT SECTION
2
LANGUAGE PROCESSING SECTION
3
4
PHRASE PATTERN CALCULATING SECTION
9
SPEECH SYNTHESIZING SECTION
5
6
BASIC ACCENT PATTERN PROCESSING SECTION
8
CORRECTING SECTION
7
5

1. An apparatus for synthesizing speech from text, comprising:
a language processing section determining an accent environment of each mora of each phrase of the text, said accent environment including a height of an accent of each mora;
a basic accent pattern table in which a basic accent pattern has been classified according to an accent environment of the mora, the basic accent pattern including pitch data which has been edited from real voice data according to the accent environment;
a basic accent pattern processing section selecting the basic accent pattern of each mora from said basic accent pattern table according to the accent environment and processing the basic accent pattern in a pitch according to the accent environment;
a correcting section receiving the basic access pattern in the pitch in said basic accent pattern processing section and correcting the pitch according to the number of moras in each phrase and the position of the moras in the phrase so as to correct the data in the corrected accent component;
a phrase pattern processing section determining a phrase component according to the number of moras in each phrase of the accent environment; and
a speech synthesizing section synthesizing speech according to an accent control pattern of the text which is obtained by adding the basic accent pattern and the basic phrase pattern.

5,463,714
SOUND DATA INTERPOLATING CIRCUIT

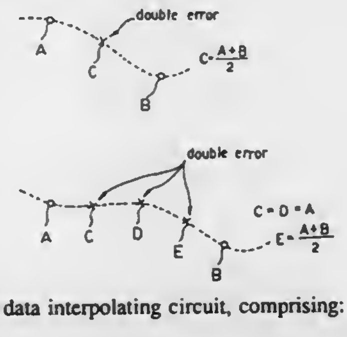
Hong-Su Han, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-do, Rep. of Korea

Filed Apr. 12, 1993, Ser. No. 45,130

Claims priority, application Rep. of Korea, Apr. 11, 1992, 92-6045

Int. Cl.^{6} G10L *9/00*

U.S. Cl. 395—2.74 **8 Claims**



1. A sound data interpolating circuit, comprising:

data converting means for converting inputted serial sound data to parallel sound data and for outputting the parallel sound data;

pulse generating means for generating interpolating pulses, channel gating pulses and loading pulses according to a double error signal outputted from a Bose-Chaudhuri-Hocquenghem (BCH) error correction circuit and a clock signal generated by clock generating means, said pulse generating means comprising:

a) an interpolating pulse generating unit for generating interpolating pulses form the double error signal outputted from the BCH error correction circuit;

b) a channel gating pulse generating unit for generating channel gating pulses in accordance with the sound data channel;

c) a loading pulse generating unit for loading pulses in order to output 16-bit data interpolated during an occurrence of double error;

d) a shift register for shifting the double error signal inputted from the BCH error correction circuit in response to the clock signal generated from the clock generating means;

e) an AND gate for generating a first interpolating pulse by performing a logical multiply operation on a first signal outputted from a first output terminal of the shift register and then inverted by an inverter and a second signal outputted from a fourth output terminal of the shift register; and

f) a NAND gate for performing a logical multiply operation on third and fourth signals outputted from a second and a fifth output terminal, respectively, and inverting a result of the logical multiply operation to generate a second interpolating pulse;

data extracting means for maintaining a prior data during a double error occurrence or outputting a data interpolated using prior and following data in accordance with the interpolating pulses inputted from the pulse generating means, the channel gating pulses, the loading pulses and clock signals generated from the clock generating means, so that for a continuing double error the prior data is maintained except for a last occurrence of the double error when the interpolated data is output;

data selecting means for outputting data outputted from the data extracting means according to a sound channel; and

average value calculating means for calculating an average value of data outputted from the data converting means and data selecting means to thereafter output the average value.

5,463,715

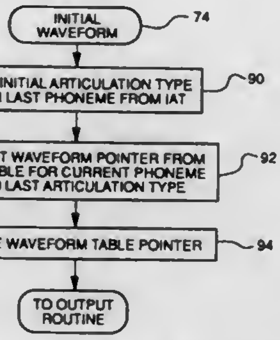
METHOD AND APPARATUS FOR SPEECH GENERATION FROM PHONETIC CODES

Richard T. Gagnon, Highland, Mich., assignor to Innovation Technologies, Hartland, Mich.

Filed Dec. 30, 1992, Ser. No. 998,459

Int. Cl.^{6} G10L *9/00*

U.S. Cl. 395—2.76 **29 Claims**


INITIAL WAVEFORM
74
GET INITIAL ARTICULATION TYPE FOR LAST PHONEME FROM IAT
90
SELECT WAVEFORM POINTER FROM IWF TABLE FOR CURRENT PHONEME AND LAST ARTICULATION TYPE
92
STORE WAVEFORM TABLE POINTER
94
TO OUTPUT ROUTINE

1. The method of generating speech comprising the steps of:

storing a plurality of digitized waveforms representing phonemes of voiced and fricative types;

assigning an articulation type to each phoneme;

inputting a series of phonetic codes representing speech wherein the series of phonetic codes identify a succession of phonemes;

for each phonetic code, generating an allophone by selecting at least one stored digitized center waveform corresponding to such phonetic code, selecting a stored digitized initial waveform according to the articulation type of the preceding phoneme in the succession, selecting a stored digitized final waveform according to the articulation type of the following phoneme in the succession, and serially combining the selected initial, center, and final waveforms; and

concatenating a series of allophones corresponding to the series of phonetic codes for producing a digital representation of the speech; and

producing audible speech from the digital representation of speech.

5,463,716

FORMANT EXTRACTION ON THE BASIS OF LPC INFORMATION DEVELOPED FOR INDIVIDUAL PARTIAL BANDWIDTHS

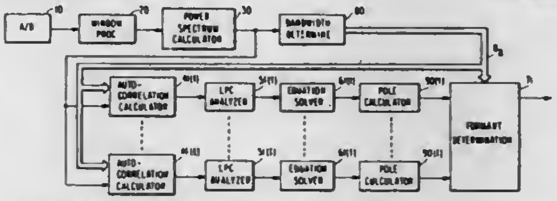
Tetsu Taguchi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 892,647, Jun. 2, 1992, abandoned, which is a continuation of Ser. No. 586,312, Sep. 20, 1990, abandoned, which is a continuation of Ser. No. 453,270, Dec. 21, 1989, abandoned, which is a continuation of Ser. No. 867,669, May 28, 1986, abandoned. This application Jan. 18, 1994, Ser. No. 185,271

Claims priority, application Japan, May 28, 1985, 60-114525; May 28, 1985, 60-114526; May 28, 1985, 60-114527

Int. Cl.^{6} G10L *9/00*

U.S. Cl. 395—2.18 **3 Claims**



1. A formant extractor comprising:

first means for receiving an electrical signal representing a speech signal having a predetermined frequency bandwidth, said predetermined frequency bandwidth comprising a low frequency bandwidth and a high frequency bandwidth;

power spectrum calculating means for determining a power spectrum for said predetermined frequency bandwidth;

autocorrelation calculating means, responsive to an output of said power spectrum calculating means, for calculating first autocorrelation information for said low frequency bandwidth and second autocorrelation information for said high frequency bandwidth;

LPC (Linear Predictive coding) determining means, responsive to said first autocorrelation information and said second autocorrelation information, for determining first LPC information and second LPC information, respectively;

pole frequency determining means, responsive to said first LPC information and said second LPC information, for determining a first set of pole frequencies and corresponding pole frequency bandwidths and a second set of pole frequencies and corresponding pole frequency bandwidths, respectively;

bandwidth determining means, responsive to said power spectrum developed by said power spectrum calculating means, for determining a boundary frequency between said low frequency bandwidth and said high frequency bandwidth; and

formant determining means for determining formant data based upon said first set of pole frequencies, said second set of pole frequencies and said boundary frequency.

5,463,717

INDUCTIVELY COUPLED NEURAL NETWORK

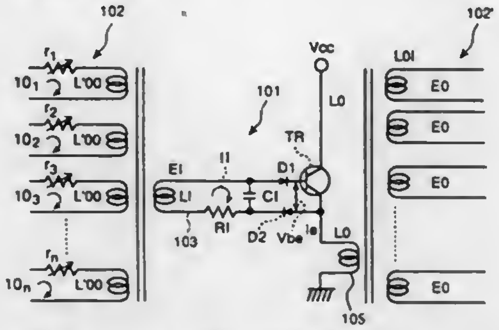
Sunao Takatori; Ryohei Kumagai; Koji Matsumoto, and Makoto Yamamoto, all of Tokyo, Japan, assignors to Yozan Inc., Tokyo, and Sharp Corporation, Osaka, Japan

Filed Jul. 9, 1990, Ser. No. 549,748

Claims priority, application Japan, Jul. 10, 1989, 1-178377; Aug. 10, 1989, 1-207220

Int. Cl.^{6} G06F *15/18*

U.S. Cl. 395—24 **5 Claims**



1. A data processing system comprising:

a normalizing element having an input inductor coupled to receive an input signal, a switching circuit responsive to the input signal to generate a switched signal, and a switched inductor energized in response to the switched signal;

a plurality of driving elements, each having an output inductor magnetically coupled to the input inductor of the normalizing element; and

a plurality of driven elements, each having a driven inductor magnetically coupled to the switched inductor of the normalizing element;

wherein the normalizing element receives an aggregation of signals from the plurality of driving elements as the input signal to the input inductor.

5,463,718

LEARNING METHOD AND APPARATUS

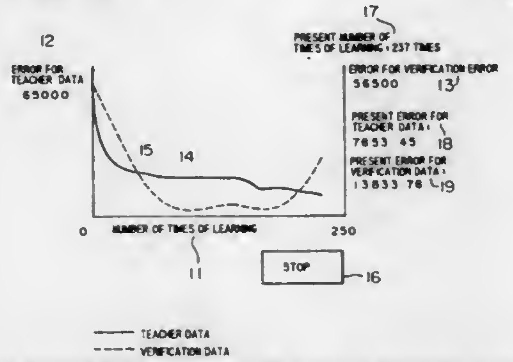
Akira Maeda, Sagamihara; Yoshikane Sugimura, Hitachi; Motohisa Funabashi, Sagamihara; Toshihiko Nakano, Ibaraki; Ryuko Someya, Kawasaki, and Michitaka Kosaka, Sagamihara, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 3, 1992, Ser. No. 971,065

Claims priority, application Japan, Nov. 8, 1991, 3-292687; Mar. 4, 1992, 4-046750

Int. Cl.^{6} G06F *15/18;9/44*

U.S. Cl. 395—23 **2 Claims**



2. A method for preventing overlearning of a model in which a plurality of teacher data is comprised of a plurality of training data each including a pair of a training input value and a training output value and further comprised of a pair of a verification input value and a verification output value, and wherein learning of said model is performed by repeating a step of receiving a training input value and a step of adjusting a calculation method in said model so that a training output value obtained by the calculation method on the basis of said received training input value approaches to a training output value in each of said training data, said method comprising the steps of:

first calculating a first error between the training output value obtained by performing the calculation method in said model on the basis of a received training input value and the training output value;

second calculating a second error between a verification output value obtained by performing an adjusted calculation method in said model on the basis of a verification input and the verification output value;

concurrently displaying said first and second errors on display means;

repeating said first and second calculating steps and said display step as learning process of the model until a comparison of said first and second errors indicates an overlearning of the model;

stopping said repeating steps in response to a user's instruction based on said displayed errors; and,

automatically saving in storing means parameters for determining the adjusted calculation method at a time when said first error becomes the smallest from a beginning of said learning.

5,463,719

FUZZY INFERENCE OPERATION METHOD AND A DEVICE THEREFOR

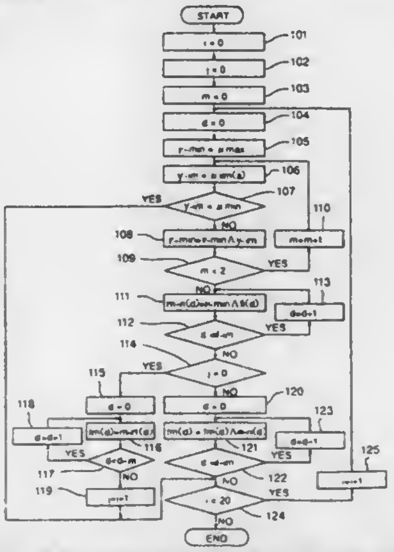
Hiroshi Okazaki, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Oct. 14, 1992, Ser. No. 961,108

Claims priority, application Japan, Jan. 16, 1991, 3-267944

Int. Cl.^{6} G06F *15/18*

U.S. Cl. 395—51 **5 Claims**



2. A fuzzy inference operation method for choosing between different processing routines comprising the steps of:

A) determining a condition part membership value by referring a singleton input variable to a condition part membership function located in a membership function storage unit,

B) judging whether the determined condition part membership value is a predetermined minimum value using a comparator,

C1) when said condition part membership value is judged to be said predetermined minimum value, selecting said predetermined minimum value as a finally desired membership value

C2) when said condition part membership value is judged not to be said predetermined minimum value, continuing the processing for determining a finally desired membership value comprising the steps of:

a) performing a first MIN value operation using a MIN value operation unit for comparing two or more membership values and selecting a smaller one as an operation result

b) repeating said referring step, said selecting step and said first MIN value operation for said condition part membership value for a number of times equal to a predetermined condition number,

c) performing a second MIN value operation with said MIN value operation unit using a result of said first MIN value operation and a conclusion part membership function,

d) repeating said second MIN value operation for a number of times equal to a division number for said membership function,

e) judging whether any MAX value operation has been executed using a comparator,

f) when any MAX value operation has been executed, executing a first MAX value operation with a MAX value operation unit using a result of the second MIN value operation and a first MAX value, and

g) when any MAX value operation has not been executed, executing a second MAX value operation with said MAX value operation unit using the result of the second MIN value operation and the first MAX value operation.

5,463,720

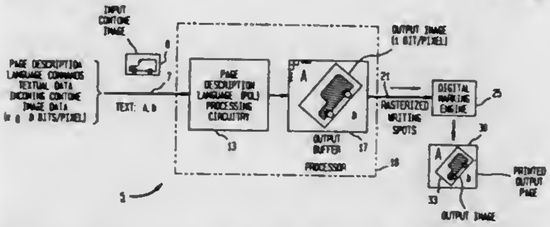
BLUE NOISE BASED TECHNIQUE FOR USE IN A HALFTONE TILE ORIENTED SCREENER FOR MASKING SCREENER INDUCED IMAGE ARTIFACTS

Edward M. Granger, Eastman Kodak Company, Rochester, N.Y. 14650-2201

Filed Sep. 28, 1992, Ser. No. 932,205

Int. Cl.^{6} H04N *1/40;1/52*

U.S. Cl. 395—109 **20 Claims**


INPUT CONTONE IMAGE
PAGE DESCRIPTION LANGUAGE COMMANDS TEXTUAL DATA INCOMING CONTONE IMAGE DATA (e.g. 8 BITS/PIXEL)
TEXT: A, B
8
7
PAGE DESCRIPTION LANGUAGE (PDL) PROCESSING CIRCUITRY
13
A
B
OUTPUT BUFFER
17
OUTPUT IMAGE (1 BIT/PIXEL)
PROCESSOR
18
21
RASTERIZED WRITING SPOTS
DIGITAL MARKING ENGINE
25
30
A
B
33
OUTPUT IMAGE
PRINTED OUTPUT PAGE
5

1. A method for producing from an input image formed of a plurality of continuous tone (contone) density values, a output halftone image with a reduced amount of visually apparent image artifacts, said method comprising the steps of:

generating a pixel sampling address representing a current pixel sampling location in a halftone cell;

converting said pixel sampling address, through a look-up operation into a pre-defined noise matrix, into a selection value, wherein said noise matrix contains pre-defined blue noise correlated uniformly distributed integer values with each of said integer values identifying a different one of a plurality of pre-defined halftone patterns and each of said patterns having a differing shape; said integer values exhibiting blue noise with a pre-defined frequency response characteristic that possesses a high pass characteristic which substantially suppresses spatial frequencies lying within a range of spatial frequencies associated with human visual acuity;

producing, in response to a particular one of said patterns identified by said selection value, a halftone output value in said output image for an incoming contone density value in said input image; and

writing said halftone output value into a spatially corresponding pixel location in a buffer that stores said output halftone image.

5,463,721

METHOD FOR CONSTRUCTING A THREE DIMENSIONAL SCANNING TRAJECTORY CAPABLE OF ACQUIRING A COMPLETE SET OF RADON DATA FOR EXACT IMAGE RECONSTRUCTION OF AN OBJECT IRRADIATED BY A CONE BEAM SOURCE

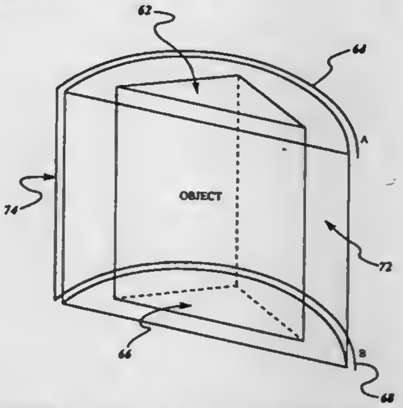
Kwok C. Tam, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jul. 29, 1991, Ser. No. 737,117

The portion of the term of this patent subsequent to Dec. 17, 2008, has been disclaimed.

Int. Cl.^{6} G06T *17/00*

U.S. Cl. 395—127 **8 Claims**



1. A method for providing a three-dimensional scanning trajectory which satisfies a completeness criterion in three dimensions, for use in acquiring data which is to be used for exact image reconstruction of an object irradiated by a scanning cone beam source, said method comprising the steps of:

providing a candidate three-dimensional scanning trajectory which is nowhere disconnected having said source for traversing the scanning trajectory in a continuous manner from start point to end point;

projecting an external surface having edges defined by said candidate scanning trajectory, said external surface forming a convex hull;

assessing whether said convex hull encloses said object; and

selecting said candidate scanning trajectory for use in acquiring data only if said convex hull is shown by said assessing step to enclose said object, to ensure that a complete set of data is acquired.

5,463,722

AUTOMATIC ALIGNMENT OF OBJECTS IN TWO-DIMENSIONAL AND THREE-DIMENSIONAL DISPLAY SPACE USING AN ALIGNMENT FIELD GRADIENT

Daniel S. Venolia, Foster City, Calif., assignor to Apple Computer, Inc., Cupertino, Calif.

Filed Jul. 23, 1993, Ser. No. 96,629

Int. Cl.^{6} G06T *17/00*

U.S. Cl. 395—133 **34 Claims**

33. A method for aligning a first object to a second object in a computer system comprising a processor, memory, display and graphic object controller, the method comprising:

a) displaying the first object and the second object on the display of the computer system;

b) displaying a cursor on the display of the computer system wherein the cursor defines a cursor position on the display of the computer system, said cursor coupled to the graphic object controller;

c) selecting with the cursor coupled to the graphic object controller the first object displayed on the display of the computer system;

d) manipulating with the graphic object controller the selected first object displayed on the display of the computer system;

e) providing an alignment field gradient emanating from the second object displayed on the display of the computer system; and,

f) aligning the manipulated first object displayed on the display of the computer system with the second object displayed on the display of the computer system wherein when the manipulated first object is manipulated with the graphic object controller to within a first predetermined distance from the second object the displayed location of the manipulated first object on the display of the computer system is gradually shifted away from the cursor position and towards the displayed location of the second object on the display of the computer system and when the manipulated first object is manipulated with the graphic object controller to within a second predetermined distance from the second object the displayed location of the manipulated first object on the display of the computer system is gradually shifted away from the cursor position and into alignment with the displayed location of the second object on the display of the computer system.

5,463,723

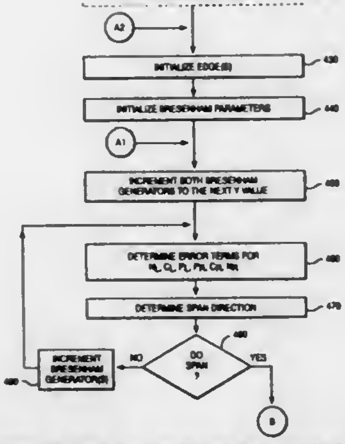
METHOD AND APPARATUS FOR FILLING POLYGONS

Avijit Saha, Austin, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 20, 1993, Ser. No. 123,510

Int. Cl.^{6} G06T ***11/00***

U.S. Cl. 395—134 **12 Claims**


RECEIVE AND STORE POLYGON
400
FIND MINIMUM Y VERTEX
410
OPTIONAL RENDER FIRST VERTEX
420
A2
INITIALIZE EDGE(S)
430
INITIALIZE BRESENHAM PARAMETERS
440
A1
INCREMENT BOTH BRESENHAM GENERATORS TO THE NEXT Y VALUE
450
DETERMINE ERROR TERMS FOR
460
DETERMINE SPAN DIRECTION
470
DO SPAN ?
480
NO
YES
INCREMENT BRESENHAM GENERATOR(S)
490
B

9. A processing system for rendering a graphical polygon, said polygon being defined by connecting edges surrounding a polygon interior comprising:

processing means for processing data;

storage means for storing data to be processed; and

graphics processing means coupled to said processing means for processing graphical data said graphics processing means including:

- i) means for computing a plurality of spans, each span including a portion of the polygon interior and at least two polygon edge points on each of at least two edges of the polygon, including computing which of the at least two polygon edge points of the span are to be rendered;
- ii) means for computing at least one color value for each computed span; and
- iii) means for rendering said spans on a display using said computed color values including only polygon edge points computed to be rendered.

5,463,724

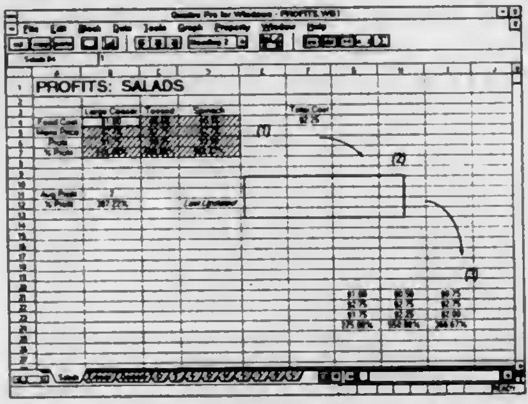
SYSTEM AND METHODS FOR IMPROVED SPREADSHEET INTERFACE WITH USER-FAMILIAR OBJECTS

Charles R. Anderson, Santa Cruz; Robert W. Warfield, Aptos; Istvan Cseri, Scotts Valley; Murray K. Low; Weikuo Liaw, both of Santa Cruz, and Alan M. Bush, Menlo Park, all of Calif., assignors to Borland International, Inc., Scotts Valley, Calif.

Continuation of Ser. No. 866,658, Apr. 8, 1992, Pat. No. 5,416,895. This application Mar. 14, 1995, Ser. No. 405,663

Int. Cl.^{6} G06F ***17/30;*** **G06T** ***1/00***

U.S. Cl. 395—148 **18 Claims**


Quattro Pro for Windows - PROFITS.WB1
File Edit Block Data Tools Graph Property Window Help
PROFITS: SALADS
(1)
(2)
(3)

1. In a computer system comprising a processor coupled to a storage device, a display, and an input device, a method of processing three-dimensional spreadsheet information comprising the steps, performed by the computer system, of:

displaying a first page array of rows and columns of cells on said display, said cells for displaying data values stored in said storage device and for displaying calculated values from spreadsheet formulas based on data values stored in said storage device, each cell having a unique cell address formed from a page, a row, and a column location for the cell, said first page array obscuring a plurality of other page arrays including second and third page arrays, said first, second, and third page arrays being stored in a single disk file;

while displaying said first page array, displaying first, second, and third page identifiers identifying said first, second, and third page arrays, respectively, with said first page identifier appearing as a notebook tab and having a user-settable page name label for identifying said first page array, and said second and third page identifiers appearing as notebook tabs and each having a user-settable page name label for identifying said second and third page arrays, respectively, said first page array having a spreadsheet formula storing a cell address for a given cell located on said second page array, said stored cell address comprising said user-settable page name label for said second page array and row and column locations for said given cell;

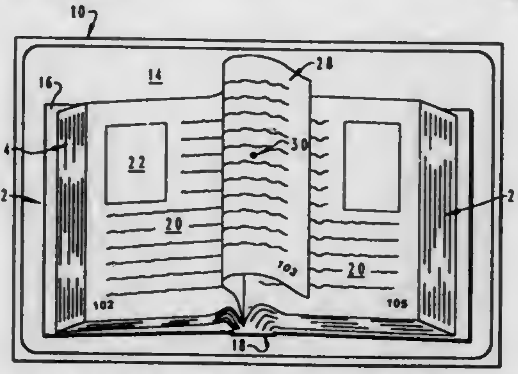
selecting said second page array of cells in response to input from said user input device; and in response to said selecting step, displaying said second page array of cells while simultaneously displaying said first, second, and third page identifiers, with said second page array obscuring said first and third page arrays, said second page identifier appearing as a notebook tab for identifying said second page array, and said first and third page identifiers appearing as notebook tabs for identifying said first and third page arrays, respectively.

5,463,725

DATA PROCESSING SYSTEM GRAPHICAL USER INTERFACE WHICH EMULATES PRINTED MATERIAL

Jonathan D. Henckel, and Paul A. Hospers, both of Rochester, Minn., assignors to International Business Machines Corp.
Filed Dec. 31, 1992, Ser. No. 998,988
Int. Cl.⁶ G06F *15/00*

U.S. Cl. 395—155 **25 Claims**



9. An apparatus for displaying information for a user, comprising:

means for displaying an image of a multiple page document on a display device;

input means for specifying a position on a displayed page of the document;

means for detecting movement of the specified position in a first direction; and

means for, in response to movement of the specified position in the first direction, displaying an animated sequence of images corresponding to turning a page of the document in the first direction.

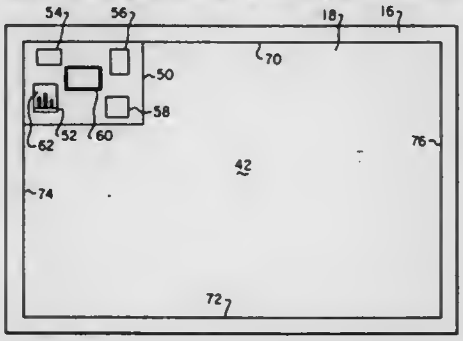
5,463,726

METHOD AND APPARATUS FOR GRAPHIC ACCESSING OF MULTIPLE SOFTWARE APPLICATIONS

Robert T. Price, Irving, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.
Continuation of Ser. No. 616,151, Nov. 20, 1990, abandoned. This application Sep. 6, 1994, Ser. No. 801,154
Int. Cl.⁶ G06F *9/38*

U.S. Cl. 395—155 **8 Claims**

6. A data processing system for accessing a plurality of software applications which are simultaneously active, said data processing system comprising:



a video display screen having fixed dimensions;

an electronic work space within said data processing system having dimensions substantially larger than said fixed dimension of said video display screen;

processor means coupled to said video display for generating an electronic representation of each of said plurality of software applications at selected locations within said electronic work space;

graphic pointing means coupled to said processor means for graphically designating in area within said video display screen:

graphic control means coupled to said processor means for generating a movable viewport within said video display screen having dimensions substantially equal to said fixed dimensions of said video display screen;

display means coupled to said processor means for providing a miniature graphic representation of substantially all of said electronic work space within said video display screen, said miniature graphic representation including iconic representations of each of said plurality of software applications, wherein a selected area within said electronic workspace may be identified utilizing said graphic pointing means within said miniature graphic representation of substantially all of said electronic work space;

position control means coupled to said processor means for relocating said movable viewport to encompass said selected area within said electronic work space in response to said identifying of said selected area; and

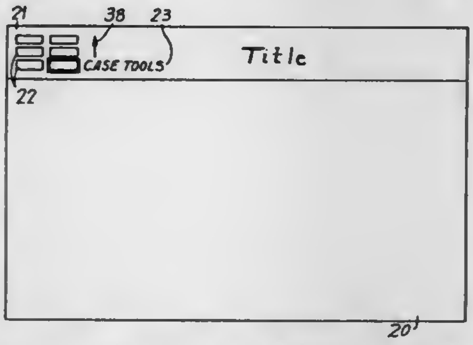
display control means coupled to said processor means for displaying said selected area within said video display screen wherein selected ones of said plurality of software applications are displayed within said video display screen.

5,463,727

WINDOW SELECTION METHOD AND SYSTEM FOR AN INTERACTIVE DISPLAY

Ralphe Wiggins, Stamford, Conn.; Elizabeth Smith, Chappaqua, and Suzanne P. Shanbaum, Mt. Kisco, both of N.Y., assignors to Advanced Systems, Inc., New York, N.Y.
Continuation of Ser. No. 598,258, Oct. 16, 1990, abandoned. This application Jan. 13, 1994, Ser. No. 300,003
Int. Cl.⁶ G06F *3/00*

U.S. Cl. 395—156 **13 Claims**



1. In a computer system, an interactive window display and selection method for directly accessing information contained in different windows or window levels, comprising the steps of:

displaying in a first window on a display screen a menu of items representative of a corresponding number of data sets;

selecting one of the menu items in the first window by using a computer control means such as a keyboard or mouse to open on the display screen a new, second window containing the data set represented by the selected menu item; and

upon opening of said second window by selection of said menu item, simultaneously reducing the scale of the non-selected menu items and displaying them on another part of the screen, whereby one of the non-selected menu items may be directly accessed and selected to open a new, third window and display it on the screen without first having to exit the second window and move through different levels to access information contained in a different heirarchy or a different level of a heirarchy than that previously selected.

5,463,728

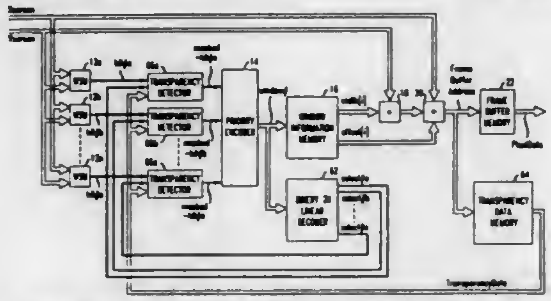
ELECTRONIC CIRCUITS FOR THE GRAPHICAL DISPLAY OF OVERLAPPING WINDOWS WITH TRANSPARENCY

Donald E. Blahut, Holmdel, and Edward S. Szurkowski, Maplewood, both of N.J., assignors to AT&T Corp., Murray Hill, N.J.

Continuation of Ser. No. 29,205, Mar. 10, 1993, abandoned. This application Mar. 14, 1995, Ser. No. 403,535

Int. Cl.^{6} G06F *9/38;3/153*

U.S. Cl. 395—158 **13 Claims**



1. An electronic circuit for generating a screen display, the screen display comprising a plurality of windows, the windows having been ordered in accordance with a predetermined display priority, each of said windows comprising a plurality of pixels, each pixel associated with a location in the screen display, the circuit comprising:

- a plurality of circuit means for detecting whether a corresponding one of said windows includes a pixel associated with a given location in the screen display;
- a plurality of transparency detector circuits, each transparency detector circuit electrically coupled to a corresponding one of said circuit means for detecting whether the corresponding window includes a pixel associated with the given location in the screen display, each of said transparency detector circuits operable to detect whether the pixel in the corresponding window associated with the given location in the screen display has been coded as a transparent pixel;
- a priority encoder circuit electrically coupled to each of said transparency detector circuits, wherein the priority encoder circuit generates a signal representing one of said windows, said represented window having a higher display priority than any other of said windows which includes a pixel associated with the given location in the screen display which has not been coded as a transparent pixel; and
- a signal generating means, electrically coupled to said priority encoder circuit, for generating a signal representing the pixel in the represented window associated with the given location in the screen display.

5,463,729

IMAGE GENERATION DEVICE

Yuko Kitaguchi, Osaka, and Hiroshi Ohta, Nara, both of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

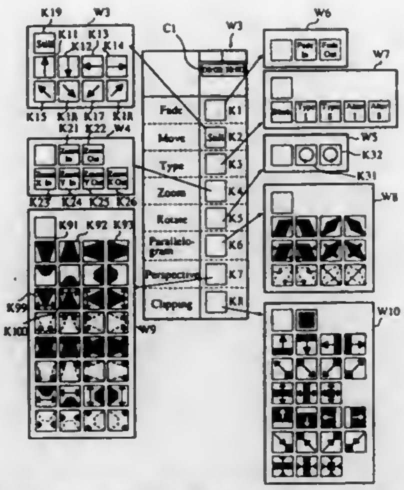
Filed Sep. 20, 1993, Ser. No. 124,691

Claims priority, application Japan, Sep. 21, 1992, 4-251026; Apr. 13, 1993, 5-085931

Int. Cl.^{6} G06F *15/62*

U.S. Cl. 395—161 **21 Claims**

1. An image generation device comprising:



- graphic data generation means for generating at least one of character data, diagram data, and picture data:
- a first graphic data storage for holding a group of graphic data which is to be subject to a given transformation over a period of time, and location data corresponding to each group of graphic data which is placed on one coordinate system;
- a second graphic data storage for holding a different group of graphic data which is subject to a different transformation to said given transformation for the group of graphic data stored in the first graphic data storage, and location data corresponding to said different graphic data which is placed on a different coordinate system:
- graphic parameter input means for inputting data including a transformation of each coordinate system, starting and ending parameters describing the state of image data at a start and an end of the transformation, respectively, and an operation time taken from the start to the end of the transformation;
- graphic parameter storage for holding the data inputted by the graphic parameter input means:
- frame data generation means for for generating frame data which describes transitional parameters for every image frame between the start and the end of the transformation, based on the data stored by the graphic parameter storage; and
- composite image generation means for reading the graphic data on each coordinate system from both of the graphic data storages, and, by converting each image frame in accordance with the transitional parameters corresponding to each piece of graphic data based on the frame data, for forming all of the graphic data on an absolute coordinate system which is outputted as a composite image signal for each frame.

5,463,730

METHOD AND APPARATUS FOR SELECTING AND DISPLAYING A PROCESS DURING PREPRESS PROCESSING OF AN IMAGE

Koji Hatada, Kyoto, Japan, assignor to Dainippon Screen Mfg., Co., Ltd., Japan

Filed Nov. 24, 1993, Ser. No. 157,633

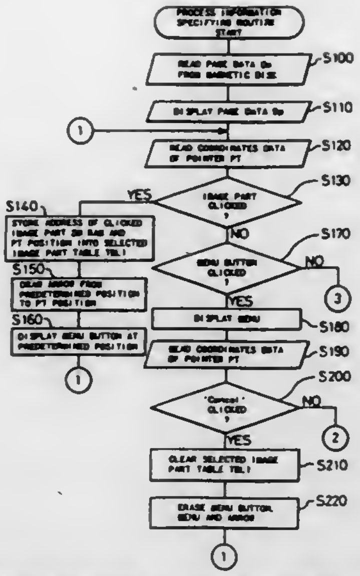
Claims priority, application Japan, Nov. 30, 1992, 4-345367

Int. Cl.^{6} G06F *15/72*

U.S. Cl. 395—161 **23 Claims**

1. An apparatus for selecting and displaying a printing process during prepress processing, in which a plurality of image parts are displayed on a display screen, said apparatus comprising:

- image part selector means for selecting at least one image part out of said plurality of image parts displayed on said display screen, said image part being selected by said image part selector means in response to a first external instruction inputted by an operator;
- switch and line display means for drawing at least one line on said display screen when said image part is selected by said selector means, said line connecting said image part selected


PROCESS INFORMATION SPECIFYING ROUTINE START
READ PAGE DATA Dp FROM MAGNETIC DISK
S100
DISPLAY PAGE DATA Dp
S110
1
READ COORDINATES DATA OF POINTER PT
S120
IMAGE PART CLICKED ?
S130
YES
S140
STORE ADDRESS OF CLICKED IMAGE PART AND PT POSITION INTO SELECTED IMAGE PART TABLE TBL1
NO
S170
S150
DRAW ARROW FROM PREDETERMINED POSITION TO PT POSITION
MENU BUTTON CLICKED ?
NO
3
YES
S160
DISPLAY MENU BUTTON AT PREDETERMINED POSITION
DISPLAY MENU
S180
READ COORDINATES DATA OF POINTER PT
S190
1
S200
'Cancel' CLICKED ?
NO
2
YES
CLEAR SELECTED IMAGE PART TABLE TBL1
S210
ERASE MENU BUTTON, MENU AND ARROW
S220
1

by said selector means to a display position on said display screen, and for simultaneously displaying a mark at said display position, said mark being responsive to a second external instruction inputted by the operator such that said mark functions as a switch, said switch having an on and an off mode;

menu display means for displaying a menu including a plurality of process titles on said display screen when said switch is in said on mode, said plurality of process titles representing a corresponding plurality of printing processes;

process selector means for selecting one of said plurality of process titles in said menu in response to a third instruction inputted by the operator; and

memory means for storing said selected process title selected by said process selector means as process information to be executed on said image part selected by said image part selector means.

5,463,731

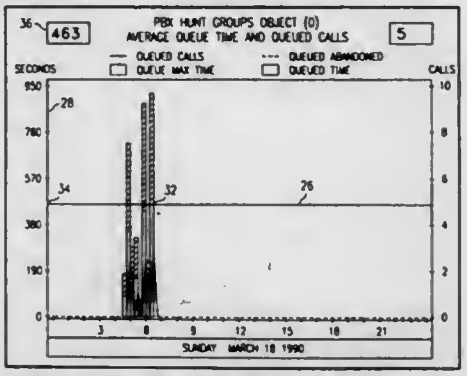
MONITOR SCREEN GRAPHIC VALUE INDICATOR SYSTEM

Stephanie Diec, Monterey Park, and Lars G. Karlsson, Fountain Valley, both of Calif., assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Continuation of Ser. No. 107,337, Aug. 16, 1993, abandoned, which is a continuation of Ser. No. 545,419, Jun. 27, 1990, abandoned. This application Nov. 4, 1994, Ser. No. 334,796

Int. Cl.^{6} G06F *3/00*

U.S. Cl. 395—161 **4 Claims**



1. A visual display interface, said visual display interface presenting for simultaneous user viewing a plurality of graphical pictures, each presented graphical picture exhibiting a relationship between two sets of numbers as a chart, graph or waveform defined by a plurality of points, said visual display interface comprising:

a plurality of presented scales, each scale presented for user viewing in association with one of the presented graphical pictures, each of said plurality of points having a numerical value with respect to at least one of the presented scales;

an indicator line presented for user viewing and manipulation, said indicator line movable along each of the presented scales to visually indicate on the scales the numerical value of a selected point in each of the graphical pictures by interconnecting the selected point on the picture and at least one of said scales; and

a plurality of windows corresponding in number to the plurality of scales, each window presented for user viewing at a location on the visual display interface different from a location for the scales, each of said windows displaying, in addition to any visual indication provided by the scales themselves, the numerical value of the selected point on a corresponding one of the graphical pictures with a greater resolution than that visually indicated by the value indicator line on the scales.

5,463,732

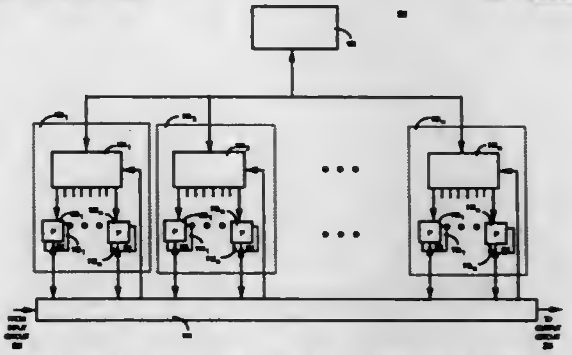
METHOD AND APPARATUS FOR ACCESSING A DISTRIBUTED DATA BUFFER

Herbert H. Taylor, Pennington, and James T. C. Kaba, Jackson, both of N.J., assignors to David Sarnoff Research Center, Inc., Princeton, N.J.

Filed May 13, 1994, Ser. No. 242,397

Int. Cl.^{6} G06F *15/16*

U.S. Cl. 395—163 **14 Claims**



1. In a parallel processing computer containing a plurality of processors, each connected to a memory unit, apparatus for accessing a distributed data buffer comprising:

a processing unit within each of said processor for executing a first routine;

a portion of each of said memory units forming a portion of said distributed data buffer and used for storing data associated with said execution of said first routine;

means, connected to said processing unit, for interrupting, in response to an interrupt signal, said execution of said first routine on said plurality of processors;

means, within each of said memory units, for storing, in response to said interrupt signal, computer status information;

said processing unit within each of the plurality of processors executes, in response to said interrupt signal, a second routine that accesses the data stored in said portion of said distributed data buffer;

means, connected to said processing unit, for restoring said status of said computer in accordance with said previously stored computer status information; and

means, connected to said processing unit, for restarting said execution of said first routine at a position within the first routine at which the first routine was interrupted to execute said second routine.

5,463,733

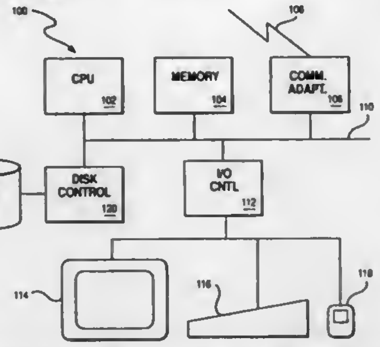
FAILURE RECOVERY APPARATUS AND METHOD FOR DISTRIBUTED PROCESSING SHARED RESOURCE CONTROL

Ira R. Forman, and Hari H. Madduri, both of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 77,230, Jun. 14, 1993, abandoned. This application Aug. 8, 1994, Ser. No. 287,046

Int. Cl.^{6} G06F *11/00*

U.S. Cl. 395—182.08 **5 Claims**



1. A method for managing recovery of a distributed processing system in which shared resources are each controlled by a master process, the distributed processing system having a plurality of processors each executing a plurality of processes and each controlled by a separate operating system, each of said processors having memory, and each of said processors interconnected to the other processors by means of a communications network, the method comprising the steps of:

- detecting failure of a master process for a shared resource;
- requesting exclusive access to a control file using a network file system management procedure independent of said operating system for said processors, if said detecting step detects a failure;
- establishing exclusive access to said control file using said network file system management, if said exclusive access request is granted;
- determining from said control file all other processes accessing said shared resource;
- invalidating said control file;
- sending a message to each of said other processes indicating failure of said master process; and
- creating a new control file and entering data for each process responding to said message.

5,463,734

MULTIPROCESSING SYSTEM FOR EXCHANGING RUNNING-STATE INFORMATION BY ENCODING THE INFORMATION INTO AN ADDRESS FOR TRANSMISSION BETWEEN PROCESSORS

Yoshiomi Yamashita, Nagoya, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 7, 1993, Ser. No. 1,626

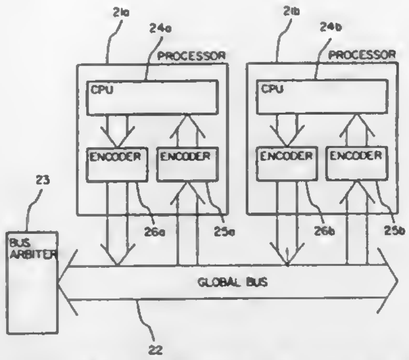
Claims priority, application Japan, Jan. 10, 1992, 4-002982

Int. Cl.^{6} G06F *7/04;7/20*

U.S. Cl. 395—200.19 **9 Claims**

1. A method of communicating running-state information, in a multiprocessing system which is composed of a plurality of processors, said running-state information indicating an operating state of respective processors, said method comprising the steps of:

- converting running states of the respective processors to address information;
- transmitting said address information from at least one of said processors;
- converting said address information to a corresponding running-state code by a receiving-side processor; and



- subsequently, collating said running-state information code and a running-state discrimination code with each other to recognize the running states of the respective processors.

5,463,735

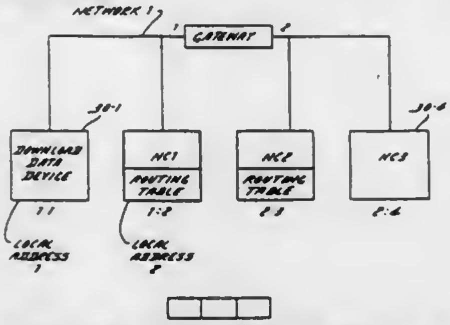
METHOD OF DOWNLOADING INFORMATION STORED IN AN ARCHING DEVICE TO DESTINATION NETWORK CONTROLLER THROUGH INTERMEDIATE NETWORK CONTROLLERS IN ACCORDANCE WITH ROUTING INFORMATION

Gregory A. Pascucci, Waukesha; David E. Rasmussen, Wales; Gaylon M. Decious, Milwaukee; James R. Garbe, Greenfield; Susan M. Hyzer, Brown Deer; Karen L. Woest, Wauwatosa; Vairavan Vairavan, Milwaukee; David L. Koch, Fox Point; Donald A. Gottschalk, Jr., Milwaukee; Dennis E. Burkhardt, Franklin; Darrell E. Standish, New Berlin; Paul W. Madaus, Oak Creek; Dan J. Spacek, Cudahy; Clay G. Nesler, New Berlin; James K. Stark, Wauwatosa; Otto M. Mageland, Greenfield; Robert R. Singers, Brown Deer, and Michael E. Wagner, Delafield, all of Wis., assignors to Johnson Service Company

Division of Ser. No. 476,031, Jan. 30, 1990, abandoned. This application Feb. 3, 1994, Ser. No. 191,284

Int. Cl.^{6} G06F *13/12;13/14*

U.S. Cl. 395—200.1 **7 Claims**



1. A method of downloading information stored in an archive device to a destination network controller in a facilities management system including a plurality of network controllers and an archive device having device non-volatile memory, the network controllers being arranged to control a process, the network controllers being arranged as at least one network and being interconnected by at least one communication link, each of the network controllers including a controller non-volatile memory, an equipment interface for receiving data relating to the process, and a processor including a drop port, the processor being coupled to the equipment interface, the facilities management system being initialized so that the network controllers are configured to each have a network address indicative of a particular location in the facilities management system, the network address including a subset indicative of an associated communication link to which the network controller is connected, a local address indicative of the network controller, and a node drop ID indicating whether the network controller is a configured or a non-configured network

controller, the network address being stored in the non-volatile memory of the network controller, the method comprising the steps of:

storing in the non-volatile memory of the archive device a destination network address of the destination network controller and an intermediate address of an intermediate network controller of the plurality of network controllers the destination address being indicative of the location of the destination network controller, the intermediate address being indicative of the location of the intermediate controller;

transmitting at least one message from the archive device to the intermediate network controller of the plurality of network controllers, the intermediate network controller having a routing table including routing information;

transferring control of transmission of the message to the intermediate network controller and passing the message from the intermediate network controller to the destination network controller in accordance with the routing information;

determining if the message should be forwarded from the destination network controller to a non-configured destination network controller coupled to the destination network controller in accordance with the node drop ID;

acknowledging receipt of the message by transmitting an acknowledge message from the destination network controller to the intermediate network controller; and

transferring control of transmission of the acknowledge message to the intermediate network controller, and passing the acknowledge message from the intermediate network controller to the archive device in accordance with the routing information.

5,463,736

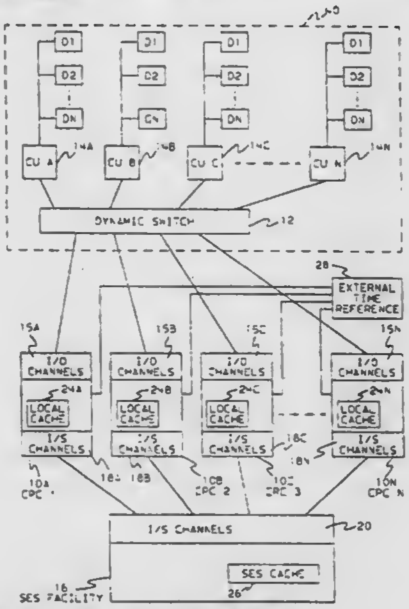
COUPLING FACILITY FOR RECEIVING COMMANDS FROM PLURALITY OF HOSTS FOR ACTIVATING SELECTED CONNECTION PATHS TO I/O DEVICES AND MAINTAINING STATUS THEREOF

David A. Elko, Poughkeepsie; Jeffrey A. Frey, Fishkill; Audrey A. Helffrich, Poughkeepsie; John F. Isenberg, Jr., Poughkeepsie; Brian B. Moore, Poughkeepsie; Jeffery M. Nick, Fishkill; Michael D. Swanson, Poughkeepsie, and Joseph A. Williams, Poughkeepsie, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 860,646, Mar. 30, 1992, abandoned. This application Oct. 18, 1994, Ser. No. 324,447

Int. Cl.^{6} G06F *13/14*

U.S. Cl. 395—848 22 Claims



1. A data processing system comprising:

one or more central processing complexes (CPCs), each CPC including

a central processor for executing programs for processing data, and

a main storage for storing data, said programs, and at least one operating system;

a coupling facility identified by a unique node identifier (NODEID);

one or more message paths connected between said CPCs and said coupling facility, each message path connected to a CPC and said coupling facility for transferring messages including commands, data and responses between its connected CPC and said coupling facility, each message path connected between said CPCs and said coupling facility not transferring data until having been activated, and each message path being identified by a unique message path identifier (MPID) generated by and recorded in said coupling facility;

a message-path status table in said coupling facility and connected to said message paths, said message-path status table having an entry for each of said message paths, each entry having status information;

program means in said programs to be executed by said central processor in each CPC for sending, to said coupling facility via the connected message path, commands to be executed by said coupling facility; and

command executing means in said coupling facility for executing said commands from said CPCs, said commands including commands for activating selected message paths such that activated ones of said message paths transfer data and responses between said CPCs and said coupling facility whereby status information is retrieved and set by said CPCs in said message-path status table.

5,463,737

INSTRUCTION BUFFER CONTROLLER IN PROCESSOR ENABLING DIRECT REFETCHING OF AN INSTRUCTION

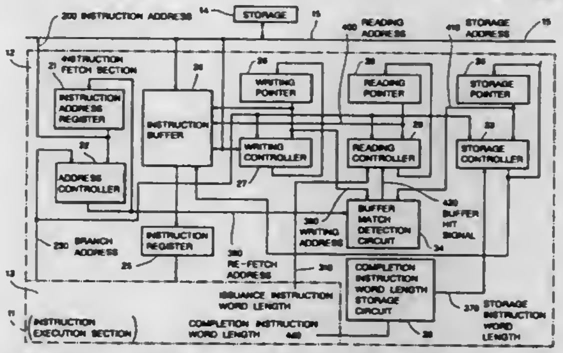
Takenori Saitoh, Ibaragi, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Feb. 26, 1993, Ser. No. 23,432

Claims priority, application Japan, Feb. 27, 1992, 4-041464

Int. Cl.^{6} G06F *12/00*

U.S. Cl. 395—496 8 Claims



1. An instruction buffer controller in a processor comprising:

an instruction buffer for storing instructions fetched out of a main storage;

a storing pointer for holding the storing address of an instruction fetched out of said main storage and stored in said instruction buffer;

a reading pointer for holding the reading address in said instruction buffer of an instruction serially fetched from said instruction buffer;

a storage pointer for holding the address of an instruction during execution in the instruction buffer;

a storage controller means, responsive to said instructions fetched from the main storage, for controlling said instruction buffer so that said instruction during execution is held in said instruction buffer until completion of execution of said instruction;

a judgement means, responsive to an instruction to be re-fetched, for judging whether an address of the instruction to be re-fetched exists between said storing address of said storing pointer and said address of said storage pointer; and

a reading controller means for setting the address of the instruction to be re-fetched at said reading pointer when said address of the instruction to be re-fetched is judged by said judgement means to exist between said storing address of said storing pointer and said address of said storage pointer.

5,463,738

MICROCOMPUTER, PROGRAM DEVELOPMENT APPARATUS, AND PROGRAM DEVELOPMENT SYSTEM

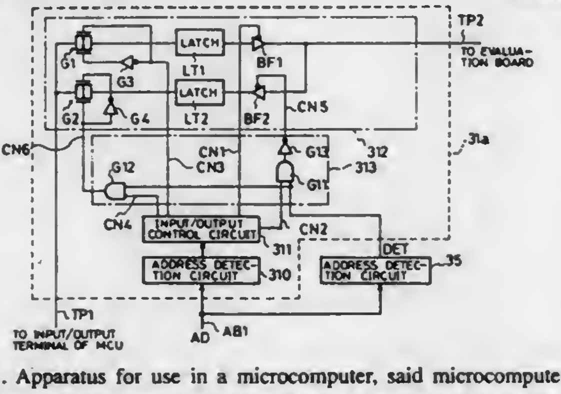
Tsugumi Matsuishi; Toshihiko Hori, and Shinji Suda, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 23, 1992, Ser. No. 903,201

Claims priority, application Japan, Jun. 27, 1991, 3-156864; Nov. 25, 1991, 3-308947; Mar. 13, 1992, 4-055728

Int. Cl.^{6} G06F *13/00*

U.S. Cl. 395—823 **7 Claims**


TP2
TO EVALUATION BOARD
LATCH
LT1
LATCH
LT2
G1
G3
G2
G4
BF1
BF2
CN5
CN6
CN1
CN3
G13
312
31a
313
G12
G11
CN4
INPUT/OUTPUT CONTROL CIRCUIT
311
CN2
DET
ADDRESS DETECTION CIRCUIT
310
ADDRESS DETECTION CIRCUIT
35
TP1
TO INPUT/OUTPUT TERMINAL OF MCU
AD
AB1

1. Apparatus for use in a microcomputer, said microcomputer capable of addressing an addressable area having at least a first address area and a second address area, wherein the microcomputer includes:

a microcomputer core including an internal circuit assigned with the first address area;

a logic circuit means assigned with the second address area, said second address area being different from the first address area; and

a detection means, responsive to an address signal from the microcomputer, for outputting a detection signal when the address signal specifies an address in the second address area; and wherein the apparatus further includes:

an input/output means, coupled between said microcomputer and an external unit, said means responsive to an address signal from the microcomputer, for inputting a signal from the external unit to the microcomputer when said input/output means is set to an input state, and for outputting a signal from the microcomputer to the external unit when said input/output means is set to an output state; and

a disabling means for preventing the input/output means from being set to the input state by responding to the detection signal sent from the detection means.

5,463,739

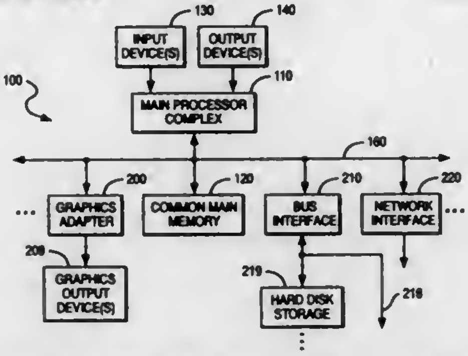
APPARATUS FOR VETOING REALLOCATION REQUESTS DURING A DATA TRANSFER BASED ON DATA BUS LATENCY AND THE NUMBER OF RECEIVED REALLOCATION REQUESTS BELOW A THRESHOLD

Virgil A. Albaugh, Round Rock; John S. Muhich, Austin; Edward J. Sliha, Austin, and Michael T. Vanover, Austin, all of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 22, 1992, Ser. No. 994,864

Int. Cl.^{6} G06F *12/02;13/14*

U.S. Cl. 395—826 **15 Claims**



1. A method for managing a data transfer between a first device and an allocated portion of common memory, wherein said first device and said common memory are coupled by a data bus, said method comprising the steps of:

receiving a reallocation request of the allocated portion of common memory from a second device;

in response to receipt of said reallocation request by said first device, determining if said data transfer can be completed without data bus latency exceeding a predetermined amount of time;

in response to determining that said data transfer can be completed without data bus latency exceeding said predetermined amount of time,

transmitting a veto of the requested reallocation to the second device; and

delaying the reallocation request;

in response to determining that said data transfer cannot be completed without data bus latency exceeding a predetermined amount of time, granting said reallocation request;

wherein the step of transmitting a veto includes transmitting a retry signal a predetermined number of times in response to receiving a reallocation request a predetermined number of times; and

in response to receiving said reallocation request more than said predetermined number of times, discontinuing the managed data transfer prior to completion.

5,463,740

DATA CONTROL DEVICE GENERATING DIFFERENT TYPES OF BUS REQUESTS AND TRANSMITTING REQUESTS DIRECTLY TO ONE OF A NUMBER OF ARBITERS FOR OBTAINING ACCESS TO A RESPECTIVE BUS

Takayoshi Taniai, Kawasaki; Hajime Satoh, Tokyo; Hidetoshi Shimura, and Tadashi Saitoh, both of Kawasaki, all of, Japan, assignors to Fujitsu Limited & Fujitsu Microcomputer Systems Ltd., Kanagawa, Japan

Continuation of Ser. No. 18,335, Feb. 22, 1993, abandoned, which is a continuation of Ser. No. 400,298, Aug. 29, 1989, abandoned. This application Feb. 13, 1995, Ser. No. 387,633

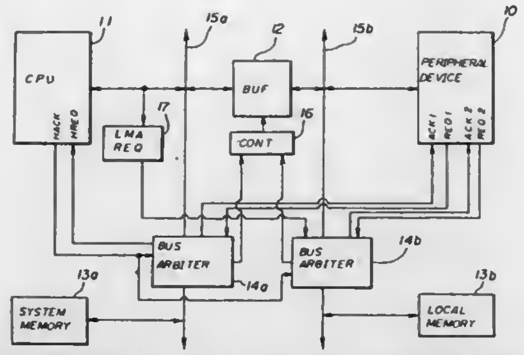
Claims priority, application Japan, Sep. 2, 1988, 63-218428

Int. Cl.^{6} G06F *13/36;13/14;13/00*

U.S. Cl. 395—299 **20 Claims**

4. A data control system comprising:

a first bus and a second bus;



- a data processing unit means, coupled to said first bus, for processing first data to be communicated and for generating a local request signal;
- peripheral device means, coupled to said second bus, for processing second data to be communicated and for selectively generating first and second request signals for acquiring a right to use said first and second buses based on types of said second data to be communicated, wherein said first request signal is generated when data on said first bus is to be communicated and said second request signal is generated when one of a plurality of commands on said second bus is to be communicated;
- first bus arbiter means, directly connected to said first bus, said data processing unit means and said peripheral device means for determining whether the right to use said first bus is acquired by said peripheral device means based on said first request signal supplied from said peripheral device means;
- second bus arbiter means, directly connected to said second bus, said data processing unit means and said peripheral device means, for determining whether the right to use said second bus is acquired by one of said peripheral device means and said data processing unit means based on said second request signal supplied from said peripheral device means and said local request signal supplied from said data processing unit means;
- first and second memory means, coupled to said first and second buses respectively, for respectively storing said data and data including said plurality of commands to be output to said first and second buses; and
- buffer means, connected between said first and second buses, for preventing said first data from competing with said second data.

5,463,741

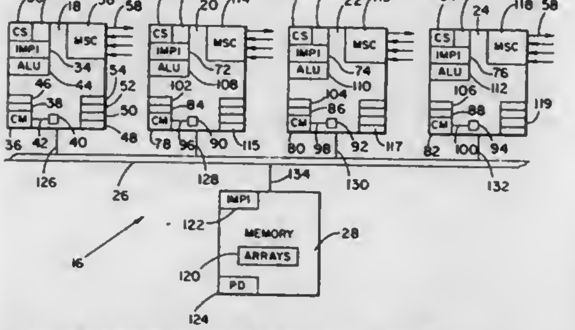
DUPLICATED LOGIC AND INTERCONNECTION SYSTEM FOR ARBITRATION AMONG MULTIPLE INFORMATION PROCESSORS

Sheldon B. Levenstein, Rochester, Minn., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 581,843, Sep. 13, 1990, abandoned. This application Oct. 16, 1992, Ser. No. 962,625

Int. Cl.^{6} G06F *13/00*

U.S. Cl. 395—299 19 Claims



1. An information processing network including:
- a plurality of processing devices for executing computer program instructions to manipulate bit-encoded data, a shared interface connected to the processing devices, and a shared resource connected to the shared interface to allow use of the shared interface for transmitting bit-encoded data between each of the processing devices and the shared resource via the shared interface;
- wherein each of the processing devices includes an arbitration sector containing arbitration logic for determining a priority among all of the processing devices for access to the shared resource via the shared interface, said arbitration sectors being substantially identical to one another; and
- an interconnection means directly coupling all of the arbitration sectors to one another independently of the shared interface for transmitting the arbitration logic among all of the arbitration sectors to maintain coherency of the arbitration logic in all of the arbitration sectors, said interconnection means including a plurality of arbitration data busses equal to the number of the processing devices, wherein each of the arbitration data busses is uniquely associated with one of the processing devices, in that each arbitration data bus is connected to the arbitration sector of its associated processing device to receive as an input the arbitration logic only from the arbitration sector of its associated processing device, each arbitration data bus further being connected to the remaining arbitration sectors of the remaining processing devices to provide the arbitration logic from its associated processing device as an input to the remaining arbitration sectors, whereby each said arbitration data bus transmits the arbitration logic only in the direction from its associated processing device to the remaining processing devices; and
- wherein each arbitration sector includes a plurality of arbitration registers, each arbitration register containing information specific to a different one of the processing devices, one of the arbitration registers in each arbitration sector containing arbitration information specific to the particular processing device containing it and providing the arbitration information as an input to the arbitration data bus associated with the particular processing device, each of the remaining arbitration registers of each arbitration sector comprising an input arbitration register for receiving arbitration information as an input from one of the arbitration data busses other than the associated arbitration data bus.

5,463,742

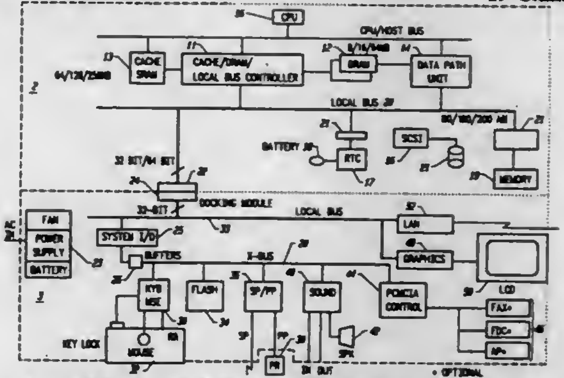
PERSONAL PROCESSOR MODULE AND DOCKING STATION FOR USE THEREWITH

Shigeo Kobayashi, San Jose, Calif., assignor to Hitachi Computer Products (America), Inc., Santa Clara, Calif.

Filed Mar. 5, 1993, Ser. No. 27,188

Int. Cl.^{6} H05K *7/10;* G06F *13/00*

U.S. Cl. 395—281 19 Claims



1. A personal processor module (PPM) for use with any one of a plurality of docking stations, each said docking station providing necessary computer system components not provided by said PPM so that said PPM and said docking station when coupled together form an operational computer system, said PPM being operable solely when coupled with said docking stations, said necessary

computer system components comprising a power supply, a keyboard and/or other input device, a display and/or other output device, said power supply supplying power to said personal processing module, a fan to generate an air stream for cooling said PPM when said docking station and said PPM are coupled together and a docking station connector for electrically connecting said docking station to said module, the personal processing module comprising a processor and related logic including main memory and/or cache memory, a mass storage device connected to and providing data storage for said processor and said logic, and a personal module connector for electrically connecting said personal module to said docking station by means of said docking station connector, said personal processor module and mass storage device thereby being driven by said power supply of said docking module and exchanging data with said docking module via said docking connector.

5,463,743

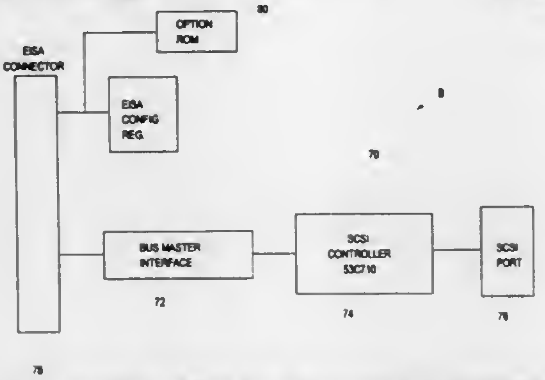
METHOD OF IMPROVING SCSI OPERATIONS BY ACTIVELY PATCHING SCSI PROCESSOR INSTRUCTIONS

William C. Galloway, Houston, Tex., assignor to Compaq Computer Corp., Houston, Tex.

Division of Ser. No. 955,845, Oct. 2, 1992. This application Dec. 1, 1993, Ser. No. 160,585

Int. Cl.^{6} G06F ***13/10***

U.S. Cl. 395—285 **3 Claims**



1. A method for handling special operations in a SCSI environment, with a host processor, memory, and a SCSI processor, the method comprising the steps of:

preparing an instruction sequence in the memory, for the SCSI processor for conventional operations, the instruction sequence including instructions for selecting the target device, sending a message to the target device and sending a command to the target device;

the host processor receiving a request for a SCSI operation, determining that said request is for a special operation, and altering said prepared SCSI processor instruction sequence to include an illegal instruction;

the host processor initiating operation of the SCSI processor after altering said instruction sequence;

the SCSI processor commencing execution of the altered instruction sequence, determining the presence of illegal instruction and indicating the presence of said illegal instruction to the host processor;

the host processor receiving indication of said illegal instruction and unaltering said prepared SCSI processor instruction sequence to legal instructions; and

the host processor causing the SCSI processor to perform the special operation after unaltering said illegal instruction.

5,463,744

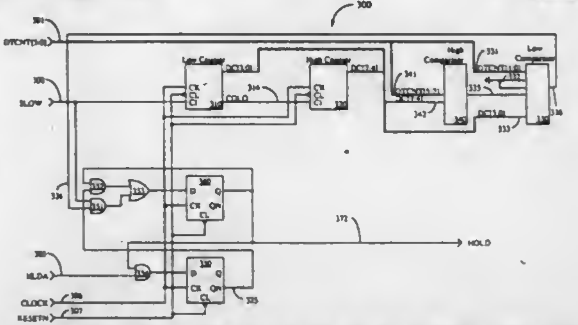
EMULATION OF SLOWER SPEED PROCESSOR

Aniruddha Kundu, Hillsboro, and Ali S. Oztaskin, Beaverton, both of Oreg., assignors to Intel Corporation, Santa Clara, Calif.

Continuation of Ser. No. 815,811, Dec. 30, 1991, abandoned. This application Mar. 2, 1994, Ser. No. 205,352

Int. Cl.^{6} G06F ***1/14***

U.S. Cl. 395—375 **13 Claims**



1. A pulse width modulation circuit for slowing the instruction execution rate of a processor in a computer system, the pulse width modulation circuit comprising:

a. a counter coupled to a system clock, the counter having a range between a first and second values, the counter incrementing upon a pulse of the clock;

b. a register containing a third value, the third value being between the first and second values;

c. a comparator coupled to the counter and the register, the comparator asserting a first signal when the counter contains a value having a predetermined relationship to the value in the register;

d. first circuitry coupled to said comparator and a central processing unit, said first circuitry asserting a hold signal to said central processing unit upon assertion of said first signal from said comparator;

e. second circuitry coupled to said first circuitry and said central processing unit, wherein said second circuitry deasserts a second signal to said first circuitry in response to a processor suspend acknowledge signal received from said central processing unit and said hold signal received from said first circuitry; and

f. said first circuitry maintaining said hold signal until said comparator deasserts said first signal and said second circuitry deasserts said second signal.

5,463,745

METHODS AND APPARATUS FOR DETERMINING THE NEXT INSTRUCTION POINTER IN AN OUT-OF-ORDER EXECUTION COMPUTER SYSTEM

Rohit A. Vidwans, Beaverton; Darrell D. Boggs, Aloha; Michael A. Fetterman, and Andrew F. Glew, both of Hillsboro, all of Oreg., assignors to Intel Corporation, Santa Clara, Calif.

Filed Dec. 22, 1993, Ser. No. 174,074

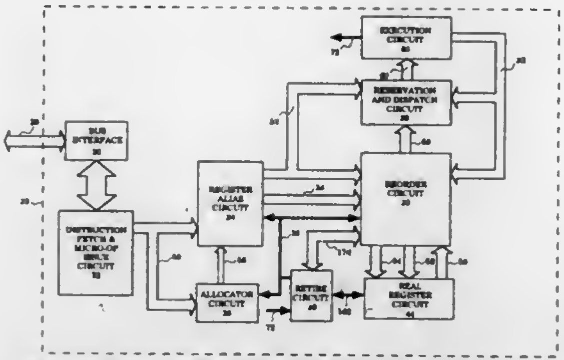
Int. Cl.^{6} G06F ***9/38***

U.S. Cl. 395—375 **22 Claims**

1. In an out-of-order execution processor having a next instruction pointer, a method for maintaining said next instruction pointer, said method comprising the steps of:

(a) reading a set of reorder buffer entries, the reorder buffer entries storing a set of branch information and speculative result data values of a set of instructions, said reorder buffer entries being arranged in a sequential program order of said instructions;

(b) determining a plurality of speculative new next instruction pointers in view of the content of said set of reorder buffer entries and individual instruction sizes of said instructions, each of said speculative new next instruction pointers indicating what said next instruction pointer should be for a particular combination of the speculative result data values if the



particular combination of speculative result data values are committed to a committed non-speculative state; and

(c) updating said next instruction pointer using one of said determined speculative new next instruction pointers in accordance to which combination of the speculative result data values, if any, are actually being committed to the committed non-speculative state;

wherein, said steps (a) through (c) are performed at each speculative execution result commitment cycle.

5,463,746

DATA PROCESSING SYSTEM HAVING PREDICTION BY USING AN EMBEDDED GUESS BIT OF REMAPPED AND COMPRESSED OPCODES

Timothy B. Brodnax, Austin, Tex.; Bryan K. Bullis, Woodbridge; Steven A. King, Herndon, both of Va.; Peter M. Kogge, Endicott, N.Y., and Dale A. Rickard, Manassas, Va., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Oct. 30, 1992, Ser. No. 968,790
Int. Cl.^{6} G06F *9/38*

U.S. Cl. 395—375 **9 Claims**

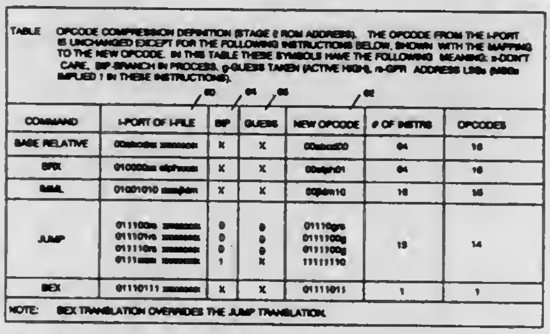


TABLE OPCODE COMPRESSION DEFINITION (STAGE 2 ROM ADDRESS). THE OPCODE FROM THE I-PORT IS UNCHANGED EXCEPT FOR THE FOLLOWING INSTRUCTIONS BELOW, SHOWN WITH THE MAPPING TO THE NEW OPCODE. IN THIS TABLE THESE SYMBOLS HAVE THE FOLLOWING MEANING: x-DON'T CARE, BIP-BRANCH IN PROCESS, g-GUESS TAKEN (ACTIVE HIGH), n-GPR ADDRESS LSBs (MSBs IMPLIED 1 IN THESE INSTRUCTIONS).

COMMAND	I-PORT OF I-FILE	BIP	GUESS	NEW OPCODE	# OF INSTRS	OPCODES
BASE RELATIVE	[illegible]	X	X	[illegible]	64	16
BRX	010000xx [illegible]	X	X	[illegible]	64	16
[illegible]	01001010 [illegible]	X	X	[illegible]	16	16
JUMP	011100[illegible] 011101[illegible] 011110[illegible] 0111[illegible]	0 0 0 1	0 0 0 X	01110[illegible] 0111100g 0111100g 11111110	15	14
BEX	01110111 [illegible]	X	X	01111011	1	1

NOTE: BEX TRANSLATION OVERRIDES THE JUMP TRANSLATION.

1. A computing machine including a main memory and employing conditional branch prediction comprising:

a prediction random access memory coupled to the main memory for receiving a selected number of least significant bits of a previously written memory address;

branch prediction logic for determining if a branch guess is in progress; generating a guess bit, if a branch is in progress, and producing a prediction based on the previously written memory address;

operational code compression means for re-mapping all processor execution instruction files into compressed operational codes and embedding the guess bit into the compressed operational codes of lesser size than original operational codes included in the instruction files; and

control logic means for interfacing between the main memory and an instruction execution read-only-memory to fetch execution instruction files from main memory, decode the instruction based on the compressed operational code including the embedded guess bit, and predict a conditional branch based on the previous written memory address and the guess bit wherein the read-only-memory is reduced in size due to the compressed operational codes including the embedded guess bit and the computing machine is improved in performance.

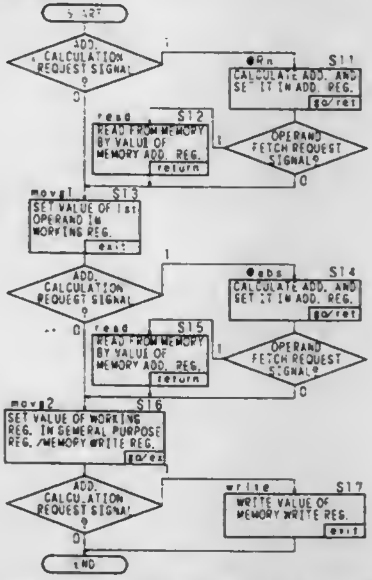
5,463,747

MICROPROGRAM DATA PROCESSOR PROCESSING OPERAND ADDRESS CALCULATION AND INSTRUCTION EXECUTION WITH COMMON HARDWARE

Shunichi Iwata, and Toru Shimizu, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 27, 1994, Ser. No. 266,400
Claims priority, application Japan, Jun. 28, 1993, 5-156545
Int. Cl.^{6} G06F *9/26;9/30;9/32;12/00*

U.S. Cl. 395—375 **12 Claims**


START
ADD. CALCULATION REQUEST SIGNAL ?
1
0
@Rn
S11
CALCULATE ADD. AND SET IT IN ADD. REG.
go/ret
read
S12
READ FROM MEMORY BY VALUE OF MEMORY ADD. REG.
return
OPERAND FETCH REQUEST SIGNAL?
1
0
movg1
S13
SET VALUE OF 1st OPERAND IN WORKING REG.
exit
ADD. CALCULATION REQUEST SIGNAL ?
1
0
@abs
S14
CALCULATE ADD. AND SET IT IN ADD. REG.
go/ret
read
S15
READ FROM MEMORY BY VALUE OF MEMORY ADD. REG.
return
OPERAND FETCH REQUEST SIGNAL?
1
0
movg2
S16
SET VALUE OF WORKING REG. IN GENERAL PURPOSE REG. /MEMORY WRITE REG.
go/ex
ADD. CALCULATION REQUEST SIGNAL ?
0
write
S17
WRITE VALUE OF MEMORY WRITE REG.
exit
END

11. A data processor which, with use of a microprogram, controls execution of instructions each having an instruction code including an operation designating part designating a kind of instruction to be executed by an operation code, and an operand designating part designating an addressing mode for operand address calculation, comprising:

microprogram storing means for storing a plurality of microprogram routines including, a plurality of microprogram routines for instruction execution corresponding to the kinds of operation codes, a plurality of microprogram routines for address calculation corresponding to the kinds of addressing modes, and a microprogram routine for reading an operand from a memory;

decoding means for decoding a part of or entire instruction code to generate an address calculation valid signal indicating whether or not the instruction requires address calculation, and an operand read valid signal indicating whether or not the instruction operand is to be read from the memory; and

controlling means for controlling execution of the microprogram routines stored in said microprogram storing means, responsive to said address calculation valid signal and the operand read valid signal generated by said decoding means;

wherein said controlling means

reads the microprogram routine for instruction execution corresponding to the operation code of the instruction code from said microprogram storing means and executes it, when said address calculation valid signal is invalid,

reads the microprogram routine for address calculation corresponding to the addressing mode designated by the operand designating part of the instruction code from said microprogram storing means and executes its when said address calculation valid signal is valid, reads the microprogram routine for memory read immediately after completing the microprogram routine for address calculation from said microprogram storing means and executes it, when said operand read valid signal is valid, and

reads the microprogram routine for instruction execution immediately after completing the microprogram routine for address calculation from said microprogram storing means and executes it, when said operand read valid signal is invalid.

5,463,748

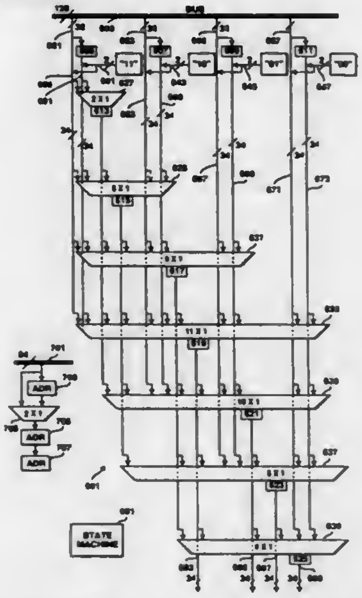
INSTRUCTION BUFFER FOR ALIGNING INSTRUCTION SETS USING BOUNDARY DETECTION

Greg Schwendinger, Santa Clara, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Filed Jun. 30, 1993, Ser. No. 85,637

Int. Cl.^{6} G06F *13/00*

U.S. Cl. 395—375 **5 Claims**



1. An instruction buffer connected to an instruction decoder for issuing instruction sets to said instruction decoder, comprising:

first, second, third, and fourth inputs, each for connecting said instruction buffer to a bus and for accepting one of four instructions from said bus;

first means for receiving an instruction from said first input and for latching that instruction as a first output;

second means for selecting an instruction from said first input, said second input and said first output, and for latching that selected instruction as a second output;

third means for selecting an instruction from said first input, said second input, said third input, said first output and said second output, and for latching that selected instruction as a third output;

fourth means for selecting an instruction from said first input, said second input, said third input, said fourth input, said first output, said second output and said third output, and for latching that selected instruction as a fourth output;

fifth means for selecting an instruction from said second input, said third input, said fourth input, said first output, said second output, said third output and said fourth output, and for latching that selected instruction as a fifth output;

sixth means for selecting an instruction from said third input, said fourth input, said second output, said third output, said fourth output and said fifth output, and for latching that selected instruction as a sixth output; and

seventh means for selecting an instruction from said fourth input, said third output, said fourth output, said fifth output and said sixth output, and for latching that selected instruction as a seventh output.

5,463,749

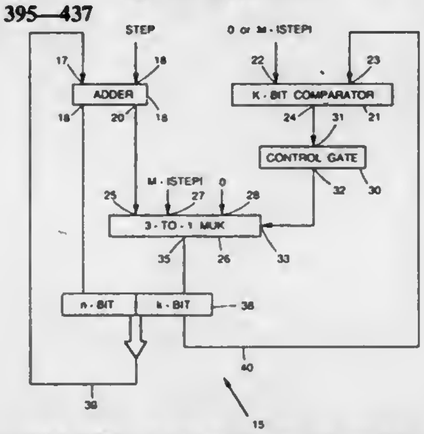
SIMPLIFIED CYCLICAL BUFFER

Gideon Wertheizer; Be'ery Yair, both of Petach-Tikva; Bat-Sheva Ovadia, Herzeliya; Yael Gross, Tel-Aviv; Ronen Perets, Ramat-Gan, and Yakov Milstein, Natanya, all of, Israel, assignors to DSP Semiconductors Ltd, Israel, and DSP Semiconductors USA, Inc., San Jose, Calif.

Filed Jan. 13, 1993, Ser. No. 3,640

Int. Cl.^{6} G06F *12/00*

U.S. Cl. 395—437 **4 Claims**



1. A cyclical buffer having an integer M number of memory locations, an integer STEP defining a number of consecutive memory locations, M being an integer multiple of STEP, and a predetermined START location defining an initial memory location defining a lower boundary of the cyclical buffer; and further including an addressing means for attaining improved buffer accessibility by setting, as many times as required, a current address to an address of successive memory locations whose contents are accessible, comprising:

least bit addressing means for addressing at least k least significant bits of the buffer where:

k is the minimal integer satisfying the relation $2^k>M-|STEP|$; and

the k least significant bits of START are zero; and the least bit addressing means includes:

incrementing means for incrementing the current address by STEP if STEP is positive and the k least significant bits of the current address are not equal to M−|STEP|,

said incrementing means further for incrementing the current address by STEP if STEP is negative and the k least significant bits of the current address are not equal to 0,

zero setting means for setting the address to zero if STEP is positive and the current address is equal to M−|STEP|, and

decrementing means for setting the address to M−|STEP| if STEP is negative and the k least significant bits of the current address are equal to 0.

5,463,750

METHOD AND APPARATUS FOR TRANSLATING VIRTUAL ADDRESSES IN A DATA PROCESSING SYSTEM HAVING MULTIPLE INSTRUCTION PIPELINES AND SEPARATE TLB'S FOR EACH PIPELINE

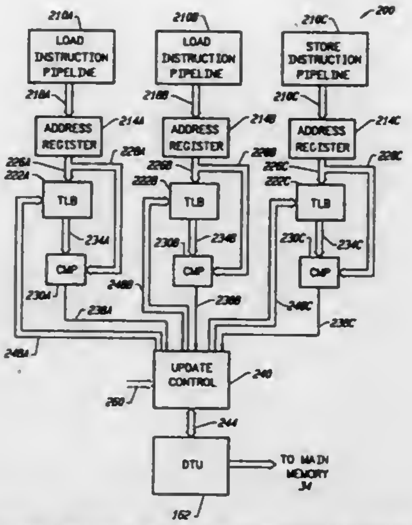
Howard G. Sachs, Belvedere, Calif., assignor to Intergraph Corporation, Huntsville, Ala.

Filed Nov. 2, 1993, Ser. No. 146,818

Int. Cl.^{6} G06F *12/10*

U.S. Cl. 395—496 **14 Claims**

1. An apparatus for translating virtual addresses in a computing system having at least a first and a second instruction pipeline and



a direct address translation unit for translating virtual addresses into real addresses, the direct address translation unit including a master translation memory for storing translation data, the direct address translation unit for translating a virtual address into a corresponding real address, comprising:

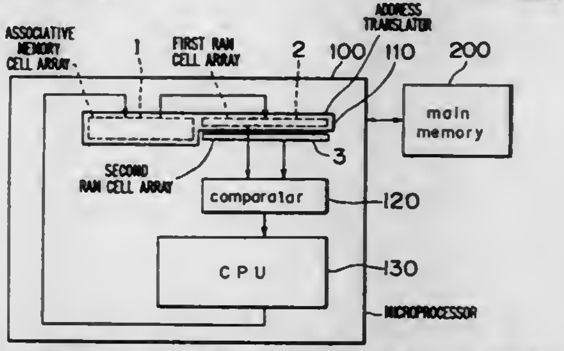
- a first translation buffer, associated with the first instruction pipeline, for storing a first subset of translation data from the master translation memory;
- a first address translator, coupled to the first instruction pipeline and to the first translation buffer, for translating a first virtual address received from the first instruction pipeline into a corresponding first real address, the first address translator comprising:
  - first translation buffer accessing means for accessing the first translation buffer;
  - first translation indicating means, coupled to the first translation buffer accessing means, for indicating whether translation data for the first virtual address is stored in the first translation buffer; and
  - first direct address translating means, coupled to the first translation indicating means and to the direct address translation unit to translate the first virtual address when the first translation indicating means indicates that the translation data for the first virtual address is not stored in the first translation buffer, the first direct address translating means including first translation buffer storing means, coupled to the first translation buffer, for storing the translation data for the first virtual address from the master translation memory into the first translation buffer;
- a second translation buffer, associated with the second instruction pipeline, for storing a second subset of translation data from the master translation memory; and
- a second address translator, coupled to the second instruction pipeline and to the second translation buffer, for translating a second virtual address received from the second instruction pipeline into a corresponding second real address, the second address translator comprising:
  - second translation buffer accessing means for accessing the second translation buffer;
  - second translation indicating means, coupled to the second translation buffer accessing means, for indicating whether translation data for the second virtual address is stored in the second translation buffer; and
  - second direct address translating means, coupled to the second translation indicating means and to the first address translation unit, for activating the direct address translation unit to translate the second virtual address when the second translation indicating means indicates that the translation data for the second virtual address is not stored in the second translation buffer, the second direct address translating means including second translation buffer storing means, coupled to the second translation buffer, for storing the translation data for the second virtual address from the master translation memory into the second translation buffer.

5,463,751

MEMORY DEVICE HAVING ADDRESS TRANSLATOR AND COMPARATOR FOR COMPARING MEMORY CELL ARRAY OUTPUTS

Hirokazu Yonezawa, Moriguchi, and Seiji Yamaguchi, Hirakata, both of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 130,146, Sep. 17, 1993, abandoned, which is a continuation of Ser. No. 616,653, Nov. 21, 1990, abandoned. This application Dec. 19, 1994, Ser. No. 358,688
Claims priority, application Japan, Nov. 22, 1989, 1-304231
Int. Cl.⁶ G06F *12/10*
U.S. Cl. 395—401 **12 Claims**



1. A semiconductor memory device having an address translator and a comparator, said address translator having an entry, said entry of said address translator comprising:

- (a) an associative memory cell array for storing and comparing a logical address of l bits, said associative memory cell array comprising l associative memory cells aligned in a word signal direction;
- (b) a first decoder connected to said associative memory cell array for generating a first word signal for said associative memory cell array;
- (c) a first random access memory cell array for storing a physical address of m bits, said first random access memory cell array comprising m random access memory cells aligned in the word signal direction;
- (d) a control means connected to said associative memory cell array and said first random access memory cell array for generating a second word signal for said first random access memory cell array according to said first word signal and a result of a comparison by said associative memory cell array;
- (e) a second random access memory cell array for storing a physical address of n bits, wherein n≦m, said second random access memory cell array comprising n random access memory cells aligned in the word signal direction;
- (f) a second decoder connected to said second random access memory cell array for generating a third word signal for said second random access memory cell array;

wherein outputs of said first and second random access memory cell arrays are connected to and compared by the comparator which outputs a signal upon coincidence between said outputs of said first and second random access memory cell arrays;

wherein $L_{RAM}<L_{CAM}$, in which L_{CAM} denotes a width of said associative memory cell array in a direction of bit signals and L_{RAM} denotes a width of said first random access memory cell array in a direction of bit signals, said associative memory cell array and said first random access memory cell array being arranged with said control means interposed therebetween, said first word signal being parallel to said second word signal and bit signals in said associative memory cell array being parallel to bit signals in said first random access memory cell array; and

said second random access memory cell array being arranged at least partly in a space beside said first random access memory cell array so that said second word signal is parallel to said third word signal, said bit signals of said first random access memory cell array being parallel to bit signals of said second random access memory cell array and said bit signals of said second random access memory cell array cross said first random access memory cell array, and said space having an area of a length of said first random access memory cell array in a direction of word signal and a width of $(L_{CAM}-L_{RAM})$.

5,463,752

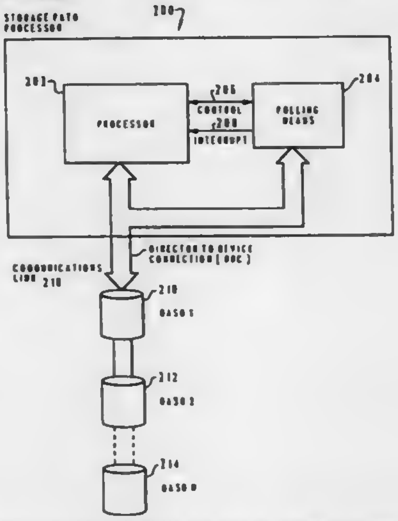
METHOD AND SYSTEM FOR ENHANCING THE EFFICIENCY OF COMMUNICATION BETWEEN MULTIPLE DIRECT ACCESS STORAGE DEVICES AND A STORAGE SYSTEM CONTROLLER

Michael T. Benhase; Brent C. Beardsley; William G. Sherman, II, and Adalberto G. Yanes, all of Tucson, Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 23, 1992, Ser. No. 949,670

Int. Cl.^{6} G06F *13/00;13/22;13/24*

U.S. Cl. 395—481 **7 Claims**



1. A data processing system having a storage system controller connected between a plurality of host computers and a plurality of storage devices, said storage system controller comprising:

processor means for controlling said plurality of storage devices;

communication means for communicating commands and data between said processor means and said plurality of storage devices;

independent polling means coupled to said communication means and said processor means for requesting interrupt status data and storing said interrupt status data from each of said plurality of storage devices., wherein said independent polling means and said processor means are coupled to the same communication means coupled to said plurality of storage devices, and wherein said independent polling means is operable in multiple modes, and wherein said processor means further includes mode control means for controlling a mode of operation of said independent polling means; and

interrupt means coupled to said independent polling means and said processor means for producing an interrupt signal at said processor means in response to the state of said interrupt status data from said plurality of storage devices wherein polling said storage devices for said interrupt status data by said processor means is not required.

5,463,753

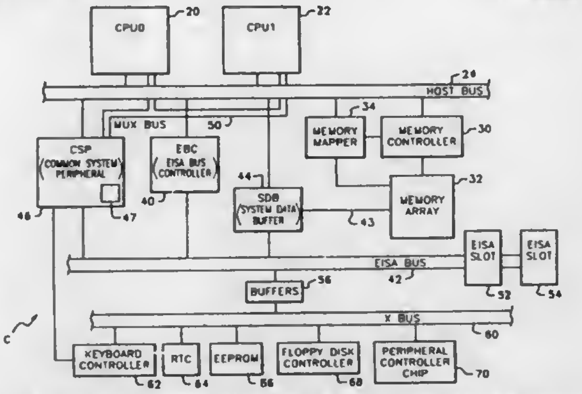
METHOD AND APPARATUS FOR REDUCING NON-SNOOP WINDOW OF A CACHE CONTROLLER BY DELAYING HOST BUS GRANT SIGNAL TO THE CACHE CONTROLLER

Walter G. Fry, and Jeff W. Wolford, both of Spring, Tex., assignors to Compaq Computer Corp., Houston, Tex.

Filed Oct. 2, 1992, Ser. No. 955,501

Int. Cl.^{6} G06F *13/14*

U.S. Cl. 395—473 **10 Claims**



1. A computer system including a cache controller non-snoop window reduction feature, comprising:

a host bus;

a processor coupled to said host bus;

a bus master coupled to said host bus;

an expansion bus coupled to said host bus;

expansion bus memory storing data coupled to said expansion bus;

a cache system coupled between said host bus and said processor, said cache system including a cache controller and cache memory, wherein said cache controller requires a bus grant signal to perform cycles to said host bus, wherein said cache controller snoops said host bus when said cache controller does not control said host bus but cannot snoop said host bus after said bus grant signal is asserted during a cycle until said cycle completes;

cycle generation means coupled to said cache system and said host bus for generating an expansion bus read cycle when said processor requests data residing in said expansion bus memory and not residing in said cache memory without providing said bus grant signal to said cache controller;

an expansion bus controller coupled between said host bus and said expansion bus, said expansion bus controller receiving said expansion bus read address and obtaining said requested data from said expansion bus memory, said expansion bus controller presenting said requested data onto said host bus; and

non-snoop window reduction means coupled to said host bus and said cache controller for providing said bus grant signal to said cache controller after said expansion bus controller presents said requested data onto said host bus, whereupon said cache controller obtains said requested data from said host bus and completes said expansion bus read cycle.

5,463,754

SHARED DIRECT ACCESS STORAGE DEVICE FOR FIXED BLOCK ARCHITECTURE DEVICES

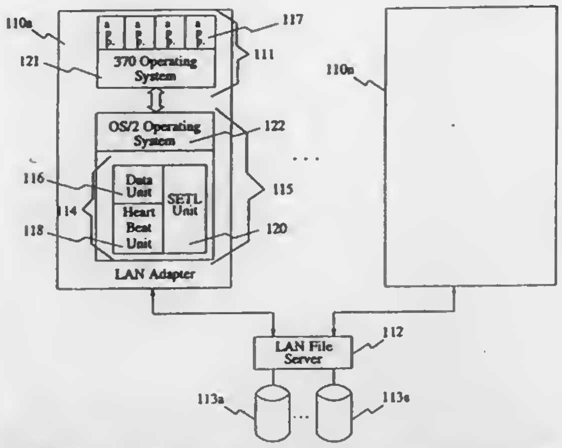
William F. Beausoleil, Hopewell Junction; Charles R. Berghorn, Pleasant Valley; John A. Hupcey, Poughkeepsie, and Sandra J. Schlosser, Woodstock, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 30, 1992, Ser. No. 969,865

Int. Cl.^{6} G06F *13/00;12/00*

U.S. Cl. 395—200.08 **3 Claims**

1. A shared fixed block architecture direct access storage system for use with a plurality of computer systems, comprising:



fixed block architecture direct access storage device having a plurality of shared files; and

control unit means coupled to said fixed block architecture direct access storage device and to at least a first one of said plurality of computer systems, said control means including
  means for creating control files, associated with said plurality of shared files,
  means for storing access information to and retrieving access information from said control files,
  means for controlling access by the plurality of computer systems to said plurality of shared files according to said access information,
  means for creating and maintaining a table of selected ones of said plurality of shared files,
  heart beat means for writing heart beat data to said control files associated with each of said plurality of shared files in said table of shared files, said heart beat data indicating whether a first computer system of the plurality of computer systems is currently in communication with each of said plurality of shared files in said table of shared file, and
  means for terminating the access of the first computer system to a one of said plurality of shared files when a second computer system of said plurality of computer systems requests access to said one of said plurality of shared files and said first computer system is no longer in communication with said one of said plurality of shared files.

5,463,755

HIGH-PERFORMANCE, MULTI-BANK GLOBAL MEMORY CARD FOR MULTIPROCESSOR SYSTEMS

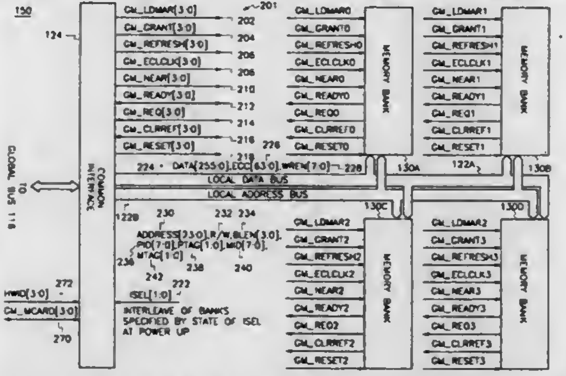
Daniel P. Dumarot, Washingtonville, and Armando Garcia, Yorktown Heights, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 700,679, May 28, 1991, abandoned. This application Jun. 22, 1994, Ser. No. 263,746

Int. Cl.^{6} G06F ***13/16;12/14;11/10***

U.S. Cl. 395—475 **23 Claims**

1. A multi-level memory system used in a multiprocessor computer system having a global bus and a plurality of processors coupled to said global bus, said memory system comprising:



a plurality of memory cards coupled to the global bus, wherein said memory cards are accessed and operate independently of one another, each of said memory cards comprising:
  (1) interface means coupled to the global bus, wherein said interface means includes means for buffering memory access requests and data received from said processors via said global bus;
  (2) a local bus coupled to said interface means; and
  (3) multiple interleaved memory banks coupled to said local bus, wherein said memory banks are accessed and operate independently of one another, each of said memory banks comprising:
    (a) memory means for storing data;
    (b) means for sending a READY signal to said interface means when said each of said memory banks is ready to receive a memory access request;
    (c) means for receiving from said interface means via said local bus a memory access request addressed to said each of said memory banks;
    (d) means for accessing said memory means as specified by said memory access request received from said interface means to retrieve data from said memory means; and
    (e) means for transferring said data retrieved from said memory means to said interface means via said local bus;

wherein said interface means comprises:
  (a) means for transferring a memory access request to one of said memory banks independent of any past transfers of memory access requests to any others of said memory banks and independent of processing of any memory access requests previously transferred to said any others of said memory banks; and
  (b) means for receiving data from said one of said memory banks independent of any past transfers of memory access requests from said interface means to said any others of said memory banks and independent of processing of any memory access requests previously transferred to said any others of said memory banks.

5,463,756

MEMORY CONTROL UNIT AND ASSOCIATED METHOD FOR CHANGING THE NUMBER OF WAIT STATES USING BOTH FIXED AND VARIABLE DELAY TIMES BASED UPON MEMORY CHARACTERISTICS

Yoshihiro Saito, and Yoshiaki Kittaka, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

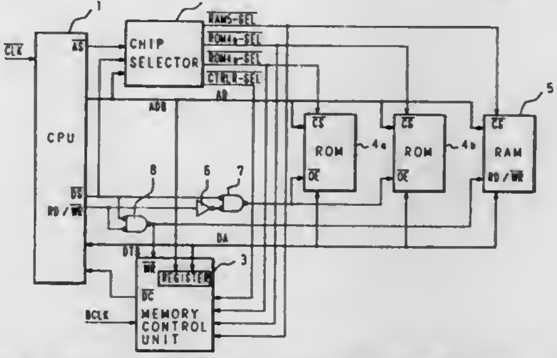
Continuation of Ser. No. 608,146, Nov. 1, 1990, abandoned. This application Aug. 4, 1993, Ser. No. 102,119

Claims priority, application Japan, Nov. 6, 1989, 1-289026

Int. Cl.^{6} G06F ***12/00;1/12***

U.S. Cl. 395—494 **14 Claims**

1. A memory control unit which outputs a response signal to a central processing unit (CPU) enabling said CPU to complete a memory access of a memory unit having an anticipated access delay time, the memory unit coupled to said CPU through a data bus and selected by a selecting signal output from a selector in



response to a control signal output from a CPU, said memory control unit comprising:

- data holding means for holding data that is at least one bit in length and used to define a segment of time, said data holding means including fixed data holding means for holding fixed data representing a fixed delay time based upon the anticipated access delay time of the memory unit, and variable data holding means for holding variable data representing a variable delay time, said variable data holding means having an input that is coupled to said CPU through the data bus;
- means for summing said fixed data with said variable data producing a summation of data representing a total delay time and
- for outputting said response signal to said CPU at a time that is in accordance with said total delay time.

5,463,757

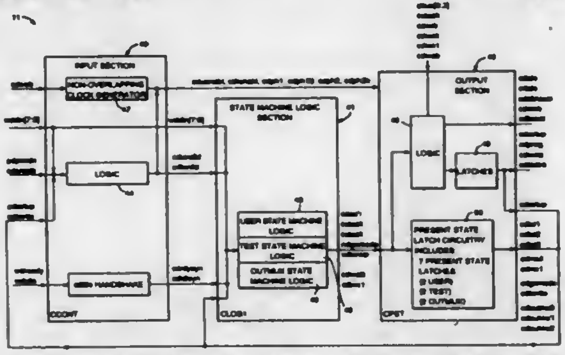
COMMAND INTERFACE BETWEEN USER COMMANDS AND A MEMORY DEVICE

Mickey L. Fandrich, Placerville; Kelvin W. Lee, Sacramento; Jerry A. Kreiffels, Citrus Heights; Virgil N. Kynett, El Dorado Hills, and Kurt B. Robinson, Newcastle, all of Calif., assignors to Intel Corporation, Santa Clara, Calif.

Continuation of Ser. No. 655,643, Feb. 11, 1991, abandoned. This application Jan. 21, 1994, Ser. No. 185,449

Int. Cl.^{6} G06F *12/00*

U.S. Cl. 395—430 **11 Claims**


INPUT SECTION
NON-OVERLAPPING CLOCK GENERATOR
LOGIC
USER HANDSHAKE
STATE MACHINE LOGIC SECTION
USER STATE MACHINE LOGIC
TEST STATE MACHINE LOGIC
OUTMUX STATE MACHINE LOGIC
OUTPUT SECTION
LOGIC
LATCHES
PRESENT STATE LATCH CIRCUITRY INCLUDES 7 PRESENT STATE LATCHES

1. A command interface in a memory system for interfacing between an external user and a memory array included in the memory system, the external user issuing commands to the memory system via a multiplicity of terminals, valid commands from the user including a program command and an erase command, the memory system including a write state machine for controlling programming and erasure of the memory array, the write state machine generating a ready signal and an idle signal, the ready signal having an active state indicating that the write state machine is not busy and having an inactive state indicating that the write state machine is busy, the idle signal having an active state indicating that the write state machine has suspended erasure, and having an inactive state, the write state machine including a status register for indicating a status of the write state machine, the memory system including output circuitry for coupling signals within the memory system to the multiplicity of terminals, the command interface including:

- a) a user state machine for controlling the operation of the write state machine via control signals including a program control signal and an erase control signal, the user state machine analyzing a command received via the terminals and bringing the program control signal active if the command is the program command, the user state machine bringing the erase control signal active if the command is the erase command, the user state machine preventing adverse effects on write state machine if the command is an invalid command by bringing the program control signal inactive and bringing the erase control signal inactive.

5,463,758

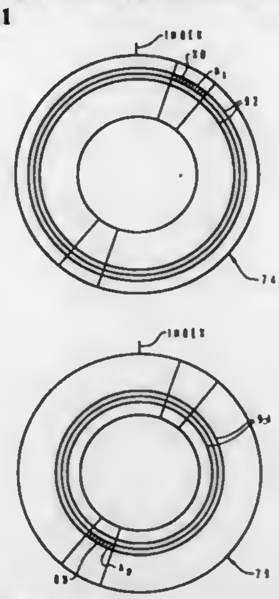
SYSTEM AND METHOD FOR REDUCING SEEK TIME FOR READ OPERATIONS IN MIRRORED DASD FILES

Hal H. Ottesen, Rochester, Minn., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 2, 1993, Ser. No. 101,138

Int. Cl.^{6} G06F *11/16;13/00*

U.S. Cl. 395—441 **18 Claims**



1. A secondary data storage system, comprising:

- a plurality of direct access storage devices having rotating media for recording data;
- means for assigning one logical address to a different location on each of the direct access storage devices, where the different locations have different radial displacement from an axis of rotation for the rotating media in each of the direct access storage devices; and
- means for mirroring a record on the direct access storage devices by writing instances of the record to each different location corresponding to a logical address.

5,463,759

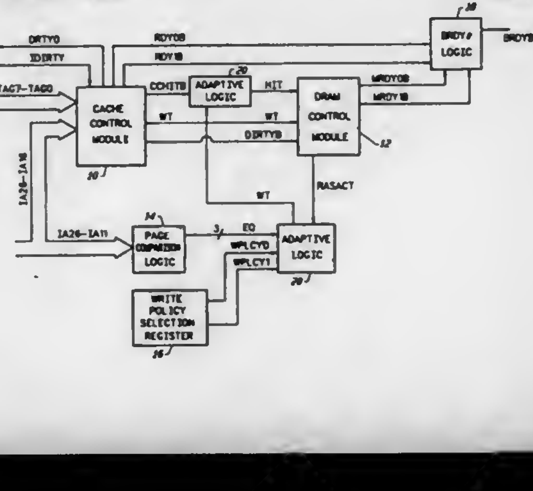
ADAPTIVE WRITE-BACK METHOD AND APPARATUS WHEREIN THE CACHE SYSTEM OPERATES IN A COMBINATION OF WRITE-BACK AND WRITE-THROUGH MODES FOR A CACHE-BASED MICROPROCESSOR SYSTEM

Subir K. Ghosh, and Dipankar Bhattacharya, both of Santa Clara, Calif., assignors to OPTi, Inc., Santa Clara, Calif.

Division of Ser. No. 889,740, May 28, 1992, which is a continuation-in-part of Ser. No. 878,730, May 4, 1992, Pat. No. 5,287,481, which is a continuation-in-part of Ser. No. 812,074, Dec. 19, 1991, Pat. No. 5,414,827. This application Apr. 10, 1995, Ser. No. 419,736

Int. Cl.^{6} G06F *12/00;12/12;13/00*

U.S. Cl. 395—461 **11 Claims**



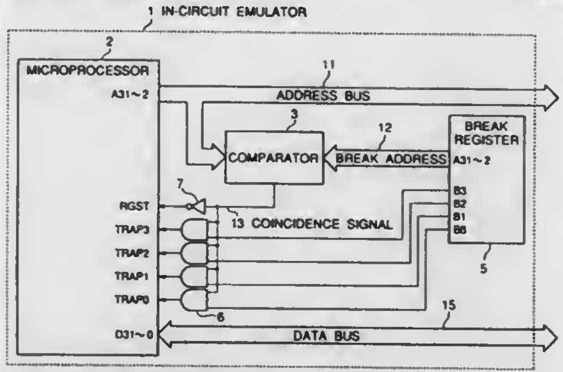
11. Memory management apparatus for use with a memory having a cache memory and a page mode DRAM memory, said DRAM memory having a row address strobe (RAS#) input coupled to receive a RAS# signal provided by said memory management apparatus, for use in response to a cache hit write data access, comprising:
- means for writing said data to said cache memory;
- first determining means for determining whether said cache hit write access is also a DRAM page hit write access;
- second determining means for determining whether said RAg# signal is active;
- third determining means for determining whether a refresh of said DRAM is pending;
- means, responsive to said first and third determining means, for writing said data through to said DRAMmemory if said cache hit write access is also a DRAMpage hit write access and no refresh of said DRAM is pending;
- means, responsive to said second and third determining means, for writing said data through to said DRAMmemory also if said RAS# signal is inactive and no refresh of said DRAM is pending;
- means, responsive to said first and second determining means, for flagging a dirty condition in said cache memory if said cache hit write access is not a DRAM page hit write access and said RAS# signal is active; and
- means, responsive to said third determining means, for flagging a dirty condition in said cache memory also if a refresh of said DRAM is pending.

5,463,760

BREAK FUNCTION IN-CIRCUIT EMULATOR FOR A MICROPROCESSOR WITH A CACHE MEMORY

Tetsuji Hamauchi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Sep. 9, 1991, Ser. No. 756,199
Claims priority, application Japan, Sep. 7, 1990, 2-237417
Int. Cl.^{6} G06F *11/00*
U.S. Cl. 395—500 **5 Claims**



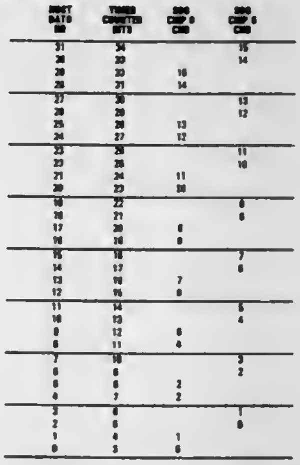
1. An in-circuit emulator comprising:
- a microprocessor including an address port, a data port, a cache memory, a plurality of interrupt request terminals, and a cache memory registration request input terminal for selecting whether or not the data obtained by accessing an external address should be registered in the cache memory,
- an address bus and a data bus respectively connected to said address port and said data port of said microprocessor, said microprocessor outputting an address on said address but for accessing data on said data bus from an external device,
- a break register for storing an address for discontinuing the execution of the microprocessor, said break register outputting a plurality of interrupt request signals based on predetermined segments of data on said data bus,
- a plurality of logic gates operatively coupled to said break register to receive respective ones of said plurality of interrupt request signals therefrom and operatively connected to respective ones of said plurality of interrupt request terminals for providing outputs to said respective ones of said interrupt request terminals of said microprocessor, and
- comparator means connected to said address bus and said break register for comparing an address outputted on said address bus from the microprocessor with the address stored in the break register and for generating, when coincidence is obtained, a coincidence output signal to the cache memory registration request input terminal of the microprocessor and said plurality of logic gates, so that the data on said data bus is inhibited from being registered into the cache memory.

5,463,761

EXTENDED DURATION HIGH RESOLUTION TIMER CONTAINED IN TWO INTEGRATED CIRCUITS AND HAVING ALTERNATING DATA SEQUENCES PROVIDED FROM DIFFERENT INTEGRATED CIRCUITS

Paul R. Culley, Cypress, Tex., assignor to Compaq Computer Corp., Houston, Tex.

Filed Oct. 2, 1992, Ser. No. 955,500
Int. Cl.^{6} G06F *1/00*
U.S. Cl. 395—550 **5 Claims**



[illegible]	[illegible]	[illegible]	[illegible]
31	34		15
30	33		14
29	33	16	
28	31	14	
27	30		13
26	29		12
25	28	13	
24	27	12	
23	26		11
22	25		10
21	24	11	
20	23	10	
19	22		9
18	21		8
17	20	9	
16	19	8	
15	18		7
14	17		6
13	16	7	
12	15	6	
11	14		5
10	13		4
9	12	5	
8	11	4	
7	10		3
6	9		2
5	8	2	
4	7	2	
3	6		1
2	5		0
1	4	1	
0	3	0	

1. A computer system including an n bit timer addressable at a predetermined address, the computer system comprising:
- an address bus for transmitting address signals, said address signals having a granularity defining a minimum data width;
- a data bus for transmitting data, said data bus having a width of at least said minimum data width defined by said address signals;
- means coupled to said address bus for indicating when the predetermined address of the timer is present;
- a microprocessor connected to said data bus and said address bus for accessing the timer;
- a first integrated circuit connected to said data bus; and
- a second integrated circuit connected to said data bus,
- said first and second integrated circuits connected to said data bus in an interleaved manner, whereby alternating data bit sequences of a predetermined width less than said minimum data width are coupled across said width of said data bus from said first and second integrated circuits to said data bus
- said first and second integrated circuits each containing an n bit timer, where n is greater than twice said predetermined width of said alternating bit sequence and each receiving said timer address present indication from said timer address present indication means, wherein when said first and second integrated circuits receive said timer address indication, said first

and second integrated circuits provide the data bits of said n bit timer from their respective timers according to said interleaved manner of connection to said data bus.

5,463,762

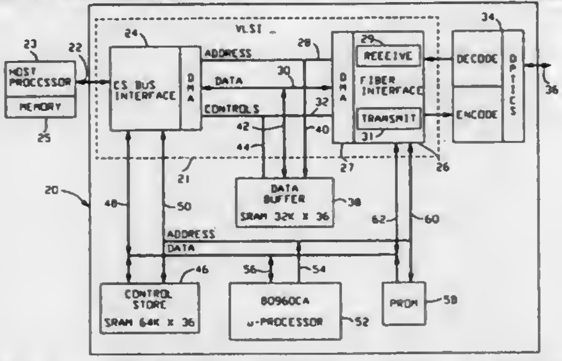
I/O SUBSYSTEM WITH HEADER AND ERROR DETECTION CODE GENERATION AND CHECKING

Douglas E. Morrissey, Exton; Edward T. Cavanagh, Jr., Norristown, and Kin H. Ng, Glenmoore, all of Pa., assignors to Unisys Corporation, Blue Bell, Pa.

Filed Dec. 30, 1993, Ser. No. 176,547

Int. Cl.^{6} G06F *1/00*

U.S. Cl. 395—185.02 **20 Claims**



8. In an Input/Output (I/O) subsystem coupled to a serial data transfer medium that transmits data from a sender to a recipient, the I/O subsystem processing a frame comprising user defined data and frame control data received over the serial data transfer medium, apparatus comprising:

a processor for determining a native sector size of the recipient;

means coupled to the processor for receiving and storing the native sector size;

a first-in, first-out (FIFO) buffer;

means for receiving and validating the frame from the serial data transfer medium, and for transmitting the user defined data to the FIFO buffer;

means for forming an Error Detection Code (EDC) that has an EDC size and is used to detect errors in the user defined data, the EDC forming means being independent from the receiving means;

switching means connected to: (1) the FIFO buffer for receiving a subset of the user defined data having a subset size that is equal to a difference between the native sector size and the EDC size, and (2) to the EDC forming means for receiving the EDC, the switching means coupled to a data buffer for transmitting one of the subset of the user defined data and the EDC to the data buffer; and

control means separate and distinct from the processor and operating without interfering with operation of the processor and independently therefrom, for providing signals that configure the switching means to successively transmit: (1) the subset of the user defined data until a number of bytes equal to the subset size have been transmitted to the data buffer and (2) the EDC, until a number of bytes equal to the native sector size have been transmitted to the data buffer, said native sector size being different from a size of the frame,

wherein said control means provide said signals to the switching means based on how many bytes of data have been transmitted to the data buffer.

5,463,763

APPARATUS AND METHOD FOR SUPERVISING MULTIPROCESSOR COMMUNICATIONS USING MESSAGES TRANSMITTED BETWEEN PROCESSORS IN A CIRCULAR FASHION

Hitoshi Kubo, Tanashi, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

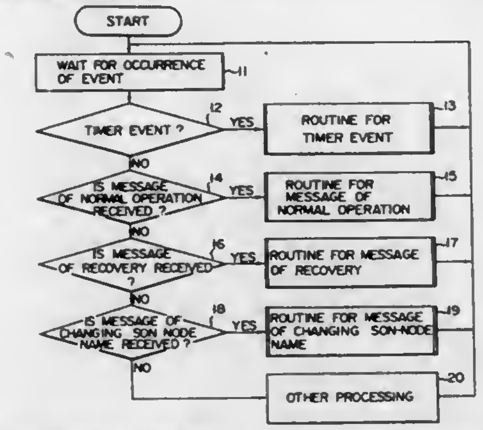
Continuation of Ser. No. 536,502, Jun. 11, 1990, abandoned.

This application Jul. 12, 1993, Ser. No. 89,636

Claims priority, application Japan, Jun. 13, 1989, 1-150193

Int. Cl.^{6} G06F *11/00*

U.S. Cl. 395—182.02 **7 Claims**


START
WAIT FOR OCCURRENCE OF EVENT
11
TIMER EVENT ?
12
YES
ROUTINE FOR TIMER EVENT
13
NO
IS MESSAGE OF NORMAL OPERATION RECEIVED ?
14
YES
ROUTINE FOR MESSAGE OF NORMAL OPERATION
15
NO
IS MESSAGE OF RECOVERY RECEIVED ?
16
YES
ROUTINE FOR MESSAGE OF RECOVERY
17
NO
IS MESSAGE OF CHANGING SON NODE NAME RECEIVED ?
18
YES
ROUTINE FOR MESSAGE OF CHANGING SON-NODE NAME
19
NO
OTHER PROCESSING
20

1. In a network comprised of a plurality of nodes, a current node comprising:

a node address table for holding addresses of the current node, a child node, a parent node, and a grandparent node, wherein normal operating messages in the network are transmitted among the plurality of nodes with the grandparent node transmitting normal operating messages to the parent node, the parent node transmitting normal operating messages to the current node, and the current node transmitting normal operating messages to the child node;

normal operating message receiving and supervising means for receiving normal operating messages from the parent node, including the address of the grandparent node, for updating the node address table with the address of the grandparent node, and for generating a signal when the current node fails to receive the normal operating message from the parent node; and

node change message transmitting means, initiated by the signal generated by the normal operating message receiving and supervising means, for transmitting a node change message to the grandparent node, including the address of the current node, wherein the grandparent node is identified by the address in the node address table, and the grandparent node comprising:

- a node address table for addresses of the parent node and the grandparent node; and
- node change message receiving and updating means for receiving the node change message from the current node and for updating its node address table, replacing the address of the parent node with the address of the current node, which was included in the node change message, and the parent node comprising:
  - recovery message transmitting means for transmitting a recovery message to the current node when it recovers from a failure, including the address of the parent node, and the current node further comprising:
  - recovery message receiving means for receiving the recovery message from the parent node;
  - recovery message processing means for updating the node address table of the current node, replacing the address of the grandparent node with the address of the parent node; and
  - recovery node change message generating and transmitting means for generating a message to the grandparent node indicating the recovery of the parent node and including

the address of the parent node, and the grandparent node further comprising:

recovery node change message receiving means for receiving the recovery node change message from the current node; and

recovery message updating means for updating the node address table of the grandparent node, replacing the address of the current node with the address of the parent node in the recovery node change message.

5,463,764

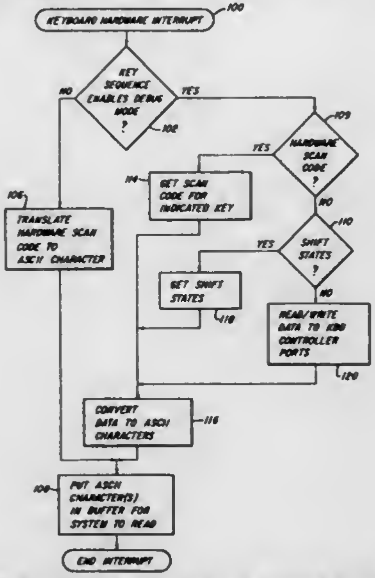
METHOD AND SYSTEM FOR SYSTEM DEBUGGING THROUGH A KEYBOARD DEVICE DRIVER

Ted R. Mueller, Boynton Beach, Fla., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 862,932, Apr. 3, 1992, abandoned. This application Oct. 6, 1994, Ser. No. 319,335

Int. Cl.^{6} G06F *11/34;3/023;19/44*

U.S. Cl. 395—182.13 6 Claims


100
KEYBOARD HARDWARE INTERRUPT
KEY SEQUENCE ENABLES DEBUG MODE ?
102
NO
YES
109
HARDWARE SCAN CODE ?
YES
NO
114
GET SCAN CODE FOR INDICATED KEY
106
TRANSLATE HARDWARE SCAN CODE TO ASCII CHARACTER
110
SHIFT STATES ?
YES
NO
GET SHIFT STATES
118
READ/WRITE DATA TO KBD CONTROLLER PORTS
120
CONVERT DATA TO ASCII CHARACTERS
116
108
PUT ASCII CHARACTER(S) IN BUFFER FOR SYSTEM TO READ
END INTERRUPT

1. A method of operating a data processing system having a plurality of resources, a keyboard and a multitasking operating system including a plurality of protection domains and a keyboard device driver which executes in a protection domain having maximum access privileges to system resources, the method comprising the steps of:

(A) responsive to a keyboard interrupt, preserving a system state during which a problem arose;

(B) providing a debugging module in the keyboard device driver;

(C) responsive to user selection, invoking the debugging module; and

(D) executing the debugging module in the protection domain of the keyboard device driver for reviewing said system state and determining whether said keyboard is active after the occurrence of said problem.

5,463,765

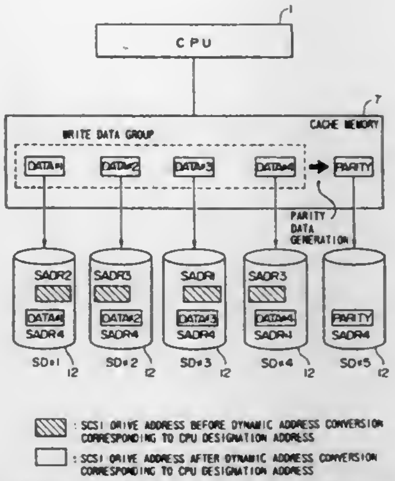
DISK ARRAY SYSTEM, DATA WRITING METHOD THEREOF, AND FAULT RECOVERING METHOD

Hitoshi Kakuta, Kokubunji; Yoshihisa Kamo, Musashimurayama, and Yoshifumi Takamoto, Hachioji, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 18, 1993, Ser. No. 34,389

Int. Cl.^{6} G11B *20/18;* **G06F** *12/00;11/10*

U.S. Cl. 395—182.04 28 Claims


CPU
1
7
CACHE MEMORY
WRITE DATA GROUP
DATA#1
DATA#2
DATA#3
DATA#4
PARITY
PARITY DATA GENERATION
SADR2
SADR3
SADR1
SADR3
DATA#1
DATA#2
DATA#3
DATA#4
PARITY
SADR4
SADR4
SADR4
SADR4
SADR4
SD#1
SD#2
SD#3
SD#4
SD#5
12
12
12
12
12
▨ : SCSI DRIVE ADDRESS BEFORE DYNAMIC ADDRESS CONVERSION CORRESPONDING TO CPU DESIGNATION ADDRESS
☐ : SCSI DRIVE ADDRESS AFTER DYNAMIC ADDRESS CONVERSION CORRESPONDING TO CPU DESIGNATION ADDRESS

1. A data writing method for a disk array system including a plurality of disk drives and a cache memory for temporarily holding a plurality of write data, said plural write data including either of data each having a predetermined data length to be newly written into said plurality of disk drives and data each having said predetermined data length for updating data which have previously been written into said plurality of disk drives, said plurality of write data having been transferred from at least one host unit, said data writing method comprises the steps of:

(a) deriving, from said plural write data held in said cache memory, as data used to constitute an error correcting data group, the write data equal in number to a predetermined number and each having said predetermined data length, and producing error correction data from said derived write data equal in number to said predetermined number;

(b) writing in parallel both of the write data having said predetermined number and said error correction data, as a single error correcting data group, into a plurality of empty regions belonging to mutually different drives of said plurality of drives; and

(c) invalidating data written into said plurality of disk drives for which said write data having said predetermined number includes the update data.

5,463,766

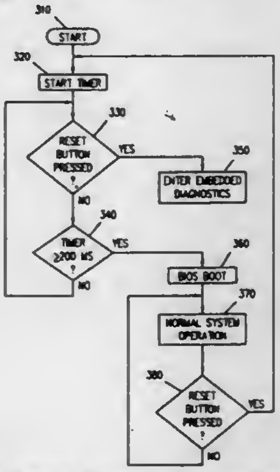
SYSTEM AND METHOD FOR LOADING DIAGNOSTICS ROUTINES FROM DISK

Eric Schieve, and Richard Finch, both of Austin, Tex., assignors to Dell USA, L.P., Austin, Tex.

Continuation-in-part of Ser. No. 34,056, Mar. 22, 1993. This application Jul. 14, 1993, Ser. No. 91,498

Int. Cl.^{6} G06F *9/06*

U.S. Cl. 395—650 44 Claims



1. A method of loading diagnostic routines in a computer system, comprising the steps of:

executing a boot loading routine stored in non-volatile memory within said computer system, said boot loading routine providing an environment in lieu of an operating system of said computer system within which to execute diagnostic routines, said boot loading routine including a disk access routine;

retrieving a diagnostic routine stored as an image on a disk into video random access memory (RAM) with said disk access routine; and

executing said retrieved diagnostic routine under control of said boot loading routine.

5,463,767

DATA TRANSFER CONTROL UNIT WITH MEMORY UNIT FAULT DETECTION CAPABILITY

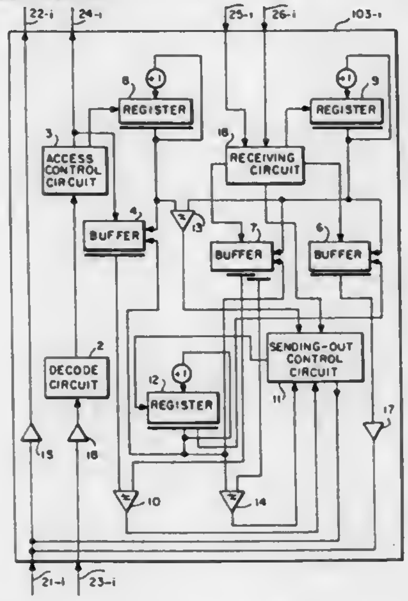
Masahiko Joichi, and Yoshihisa Furukawa, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Feb. 24, 1993, Ser. No. 21,680

Claims priority, application Japan, Feb. 24, 1992, 4-072144

Int. Cl.^{6} G06F *11/00;7/02*

U.S. Cl. 395—183.13 **9 Claims**



1. A data transfer control unit including a plurality of channel sections, said unit provided between a memory unit and a plurality of peripheral units, each of said channel sections comprising:

first storage means having a plurality of addressable storage locations;

first control means responsive to a request command given from a corresponding one of said peripheral units for generating an identification number and sending said request command and said identification number to said memory unit;

second control means for storing said identification number sent out from said memory unit, after said memory unit processes said request command, at a designated storage location in said first storage means, said designated storage location corresponding to said identification number; and

first comparison means connected to said first storage means for comparing said identification number with an address representing said storage location where said identification number is stored in said first storage means.

5,463,768

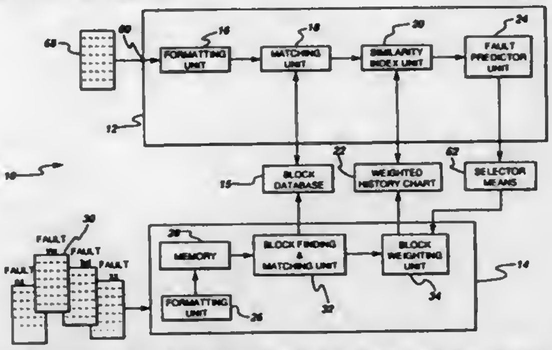
METHOD AND SYSTEM FOR ANALYZING ERROR LOGS FOR DIAGNOSTICS

Paul E. Cuddihy, Schenectady, and Rasiklal P. Shah, Latham, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 17, 1994, Ser. No. 214,266

Int. Cl.^{6} G06F *11/00*

U.S. Cl. 395—183.13 **22 Claims**



1. An error log analysis system for analyzing an error log generated from a malfunctioning machine, comprising:

means for storing a plurality of historical error logs generated from a plurality of malfunctioning machines, each of the plurality of historical error logs containing data representative of events occurring at the plurality of malfunctioning machines during operation, the plurality of historical error logs being grouped into case sets of common malfunctions;

means for receiving a new error log from a malfunctioning machine, the new error log containing data representative of events occurring at the malfunctioning machine during operation;

means for comparing the new error log to the plurality of historical error logs, the comparing means locating sections of data in the new error log that are common to sections of data in each of the case sets defined for the plurality of historical error logs, the comparing means comprising block finding means for finding the common sections of data between each of the case sets in the plurality of historical error logs, the common sections of data being identified as blocks; and

means for predicting which of the common sections of data are indicative of the malfunction.

5,463,769

METHOD AND APPARATUS USING DICTIONARY OF METHODS AND STATES FOR HIGH PERFORMANCE CONTEXT SWITCHING BETWEEN BUILD AND RUN MODES IN A COMPUTER APPLICATION BUILDER PROGRAM

Bruce A. Tate; Alex C. Chow, and Stephen B. Gest, all of Travis County, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 15, 1993, Ser. No. 168,104

Int. Cl.^{6} G06F *15/02;9/06*

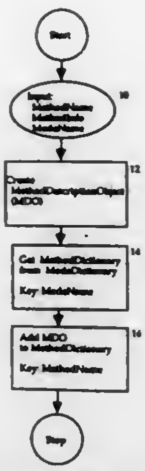
U.S. Cl. 395—700 **8 Claims**

1. An object oriented method for mode switching between build and run modes in a computer application builder program, comprising the steps of:

providing a plurality of dictionaries as dam structures which use keys to identify objects which implement methods, wherein at least first and second ones of said dictionaries define one or more methods for a first and a second mode and a third one of said dictionaries is a mode dictionary which defines build and run modes for an application program being programmed using the computer application builder program;

identifying one or more keys for each of said dictionaries; and

switching between build and run modes of the application program being programmed using the computer application



builder program by using said one or more keys for said mode dictionary to retrieve a method dictionary for a corresponding mode.

5,463,770

SYSTEM AND METHOD FOR CONTROLLING DATA STORAGE IN A DATA PROCESSING SYSTEM IN WHICH OBJECTS GENERATED WITHIN A LOWER LEVEL LANGUAGE PROGRAM ARE ASSOCIATED WITH MEMORY SLOTS ALLOCATED TO ANOTHER PROGRAM

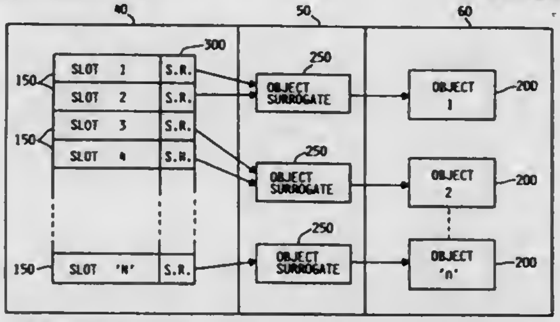
Stephen J. P. Todd, Winchester, England, assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 95,633, Jul. 21, 1993, abandoned. This application Mar. 6, 1995, Ser. No. 400,301

Claims priority, application United Kingdom, Jul. 22, 1992, 9215597

Int. Cl.^{6} G06F *13/00;12/00*

U.S. Cl. 395—600 **10 Claims**



1. A data processing system in which a first high level program interacts with a second lower level language program, the system having means for generating objects within the second program, said system comprising:

a high level language memory having memory allocation slots accessible by and allocated to the first program;

an object memory for storing the objects, said objects memory being accessible by and allocated to the second program;

means for associating the objects stored in said object memory with said memory allocation slots, said associating means comprising:

(a) an interface in communication with the first and second programs, the interface residing within the first program and having access to an interface memory;

(b) an object surrogate contained within said interface memory, said object surrogate including an identifier for a given one of the objects stored in said object memory to be associated with one or more of said memory allocation slot; and

(c) a surrogate reference stored by the first program in said one or more of said memory allocation slots, the surrogate reference associating said one or more memory allocation slots with the object surrogate; and

informing means, in communication with said second program and having access to said interface memory and said high level language memory, for determining if the object surrogate is no longer associated by any surrogate reference with any said memory allocation slots, for informing the second program of said identifier in said object surrogate when the object surrogate is no longer associated by any surrogate reference with any of said memory allocation slots, and for erasing the unassociated object surrogate.

5,463,771

IMAGE DATA FILING SYSTEM COMPRISING OF AN OPTICAL DISK LIBRARY AND A DISK ARRAY

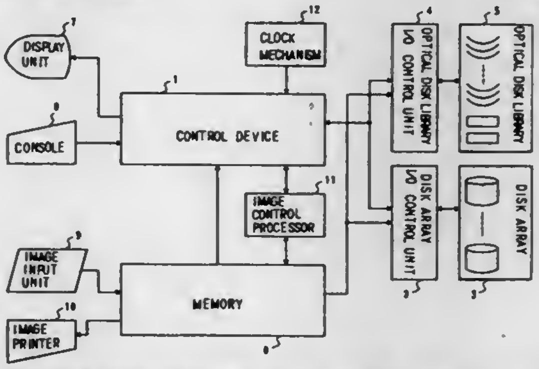
Osamu Sotoyanagi, Iwate; Yoshinori Okami, Odawara, and Naoya Takahashi, Yokohama, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 9, 1992, Ser. No. 911,029

Claims priority, application Japan, Jul. 12, 1991, 3-172617

Int. Cl.^{6} G06F *13/00;11/14*

U.S. Cl. 395—600 **7 Claims**



1. An image filing system for stocking image data, comprising:

(a) a library housing a plurality of image storage media for storing image data, said storage media being one of an optical disk and a record surface of an optical disk;

(b) a disk array which stores a duplicate of all image data stored in at least one of said plurality of image storage media;

(c) a control device which controls said library and said disk array;

(d) a console which accepts instructions of an operator;

(e) an image output device which outputs an image indicator by image data;

said library including notification means to notify, when a new image storage medium has been housed therein, said control device to that effect; and

said control device including:

(1) registration means to (i) control reading out all the image data stored in at least one of said image storage media housed in said library, (ii) control writing said image data read out of the image storage medium into said disk array, (iii) generate information relating the read image data with said image storage medium from which it has been read, and (iv) control writing the generated information into said disk array;

(2) playback control means to (i) perform when said console has accepted an instruction of playing back a specified image data of a specified image medium, (ii) control reading out said image data stored in said disk array and related with said specified image medium, on the basis of said information on the specified image data as stored in said disk array, and (iii) control outputting the image indicated by said image data read out of said disk array, through said image output device;

(3) remaining capacity inspection means to inspect a remaining storage capacity of said disk array; and

(4) registration decision means to decide when notified by said library, if image data stored in said image storage medium housed in said library anew can be registered into said disk array, on the basis of the remaining capacity inspected by said remaining capacity inspection means;

wherein said registration means performs, when said registration decision means has decided that said image data can be registered, the control of reading out said image data stored in said image storage medium housed anew, from said image storage medium housed anew, the generation of the information relating the read image data with said image storage medium housed anew, and the control of writing said read image data and the generated information into said disk array.

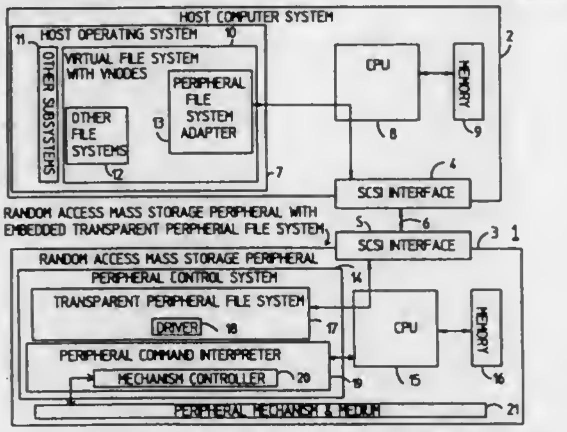
5,463,772

TRANSPARENT PERIPHERAL FILE SYSTEMS WITH ON-BOARD COMPRESSION, DECOMPRESSION, AND SPACE MANAGEMENT

Bruce A. Thompson, Highlands Ranch; David J. Van Maren, Ft. Collins; John G. McCarthy, Thornton; R. Andrew Purcell, Ft. Collins, and Michael Rottinghaus, Greeley, all of Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Apr. 23, 1993, Ser. No. 52,437
Int. Cl.^{6} G06F *13/12;17/30*

U.S. Cl. 395—600 **22 Claims**


HOST COMPUTER SYSTEM
HOST OPERATING SYSTEM
11
10
2
OTHER SUBSYSTEMS
VIRTUAL FILE SYSTEM WITH VNODES
PERIPHERAL FILE SYSTEM ADAPTER
13
OTHER FILE SYSTEMS
12
7
CPU
8
MEMORY
9
SCSI INTERFACE
4
RANDOM ACCESS MASS STORAGE PERIPHERAL WITH EMBEDDED TRANSPARENT PERIPHERIAL FILE SYSTEM
5
6
SCSI INTERFACE
3
1
RANDOM ACCESS MASS STORAGE PERIPHERAL
PERIPHERAL CONTROL SYSTEM
14
TRANSPARENT PERIPHERAL FILE SYSTEM
DRIVER
18
17
CPU
MEMORY
PERIPHERAL COMMAND INTERPRETER
MECHANISM CONTROLLER
20
19
15
16
PERIPHERAL MECHANISM & MEDIUM
21

21. A random access storage device responsive to file system commands for the storage and retrieval of information, the random access storage device comprising:

an interface that receives file system commands and that also transfers information to and from the random access storage device;

a storage mechanism that writes information to and reads information from a storage medium;

a command execution system, coupled to the interface and to the storage mechanism, that recognizes file system commands received by the interface and that also accomplishes those commands by initiating and controlling sequences of storage mechanism actions that read and write as files the information written to and read from the storage medium; and

a data compressor/decompressor, responsive to the command execution system, having a first port coupled to the interface and also having a second port coupled to the storage mechanism, that compresses and decompresses information, during compression the first port receiving file information to be compressed and the second port presenting to the storage mechanism the resulting compressed file information, while during decompression the second port receiving from the storage mechanism compressed file information to be decompressed and the first port presenting to the interface the resulting decompressed file information.

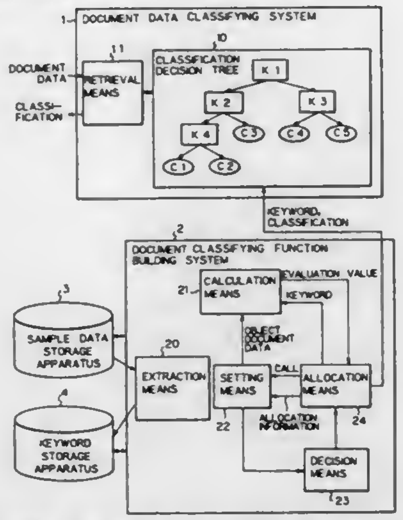
5,463,773

BUILDING OF A DOCUMENT CLASSIFICATION TREE BY RECURSIVE OPTIMIZATION OF KEYWORD SELECTION FUNCTION

Yasubumi Sakakibara, and Kazuo Misue, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed May 25, 1993, Ser. No. 66,218
Claims priority, application Japan, May 25, 1992, 4-131211
Int. Cl.^{6} G06F *17/30*

U.S. Cl. 395—600 **6 Claims**



1. A document classifying system comprising:

a document data classifying system for inputting document data and defining a classification to which the document data belongs;

a document classifying function building system operatively connected to the document data classifying system for automatically and recursively building a classification decision tree in the document data classifying system by optimization of a function determined by selection of keywords in the tree;

a sample data storage apparatus operatively connected to the document classifying function building system for storing sample data formed by a set comprised of the document data and the classification to which the document data belongs; and

a keyword storage apparatus operatively connected to the document classifying function building system for storing keywords extracted thereby.

5,463,774

OBJECT ORIENTED COMPUTER ARCHITECTURE USING DIRECTORY OBJECTS

Steven M. Jenness, Redmond, Wash., assignor to Digital Equipment Corporation, Maynard, Mass.

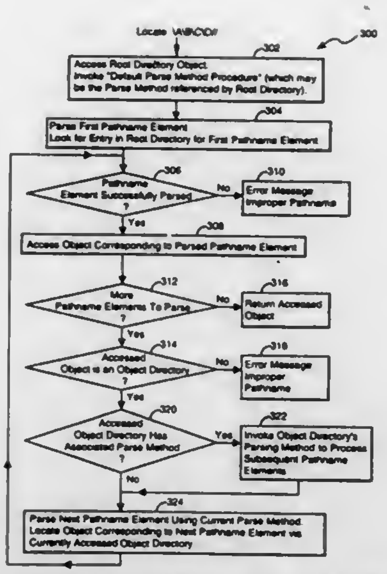
Filed Jun. 28, 1993, Ser. No. 84,292
Int. Cl.^{6} G06F *17/30*

U.S. Cl. 395—600 **9 Claims**

1. A method of operating a computer system having a central processing unit and memory means, the method comprising the steps of:

storing a multiplicity of objects comprising data structures in said memory means, including storing in said memory means a directed graph of directory objects for locating and accessing said multiplicity of objects, each directory object storing object names and object pointers for locating and accessing other objects stored in said memory means; said directory objects including a root directory object which includes object names and object pointers to a set of first level directory objects;

each object stored in said memory means having an associated pathname that defines a path through said directed graph of directory objects for accessing said each object; each path-


Locate \A\B\C\D\F
300
302
Access Root Directory Object.
Invoke "Default Parse Method Procedure" (which may be the Parse Method referenced by Root Directory).
304
Parse First Pathname Element
Look for Entry in Root Directory for First Pathname Element
306
Pathname Element Successfully Parsed ?
No
310
Error Message Improper Pathname
Yes
308
Access Object Corresponding to Parsed Pathname Element
312
More Pathname Elements To Parse ?
No
316
Return Accessed Object
Yes
314
Accessed Object is an Object Directory ?
No
318
Error Message Improper Pathname
Yes
320
Accessed Object Directory Has Associated Parse Method ?
Yes
322
Invoke Object Directory's Parsing Method to Process Subsequent Pathname Elements
No
324
Parse Next Pathname Element Using Current Parse Method.
Locate Object Corresponding to Next Pathname Element via Currently Accessed Object Directory

name comprising a succession of path elements that includes first and last path elements;

providing each of a plurality of said directory objects with a distinct pathname parsing procedure for locating those of said multiplicity of objects whose pathname includes (A) a path element, other than said last path element, identifying said each directory object;

said computer system receiving a specified object pathname and successively parsing said path elements in said specified object pathname by (A) accessing successive directory objects identified by said successively parsed path elements, (B) accessing the object identified by said specified object pathname when said last path element is parsed, and (C) determining when any of said accessed directory objects includes a distinct pathname parsing procedure and invoking said distinct pathname parsing procedure of said accessed directory object to parse the path elements of said specified object pathname not yet parsed.

5,463,775

SYSTEM AND MEHTOD FOR PERFORMING MONITORING OF RESOURCES IN A DATA PROCESSING SYSTEM IN REAL TIME

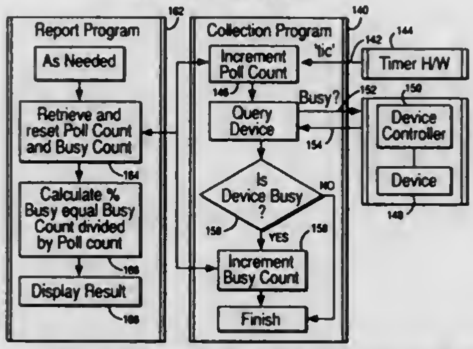
Jimmie E. DeWitt, Georgetown; Timothy M. Holck, Austin; James H. Summers, Round Rock, and Samuel L. Emrick, Austin, all of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 713,484, Jun. 10, 1991, abandoned. This application Jun. 20, 1994, Ser. No. 263,153

Int. Cl.^{6} G06F *13/00;12/00*

U.S. Cl. 395—184.01 **8 Claims**

Diagram for "Technique for Measuring Peripheral Device Utilization"



1. A method for indicating utilization of resources including a random access memory, a processor and at least one peripheral device in a data processing system, comprising the steps of:

monitoring of said random access memory, a portion of said monitoring being performed by a first device driver which computes a non-allocatable working amount of memory for specific time period and then adds a portion of allocatable memory to said working memory when it is determined that the allocatable memory portion has been accessed by recently than said working memory;

determining by a second device driver, usage of said at least one peripheral device by computing a ratio of a total number of hardware timer interrupt signals sent to said at least one peripheral device and a number of corresponding, signals received from said device indicating that said device is busy;

measuring, by a third device driver, activity of said processor by initiating a process with a lowest possible priority on said processor and determining an amount of idle time when said low priority process is executing on said processor;

generating, by said data processing system, resource data, indicating usage of said random access memory, said processor and said at least one peripheral device; and

displaying in real time, by said data processing system, said resource data of said data processing system.

5,463,776

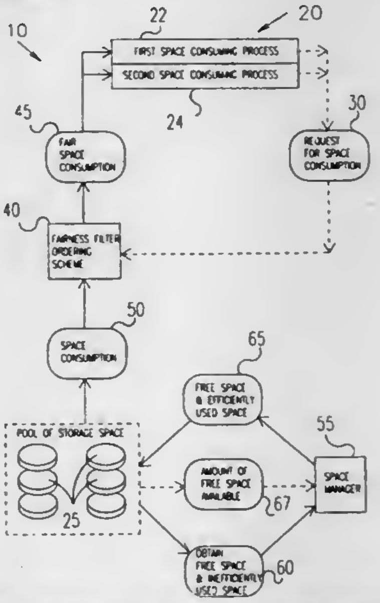
STORAGE MANAGEMENT SYSTEM FOR CONCURRENT GENERATION AND FAIR ALLOCATION OF DISK SPACE AMONG COMPETING REQUESTS

Douglas L. Voigt, and Michael B. Jacobson, both of Boise, Id., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Sep. 22, 1994, Ser. No. 311,615

Int. Cl.^{6} G06F *12/00*

U.S. Cl. 395—600 **20 Claims**


10
22
20
FIRST SPACE CONSUMING PROCESS
SECOND SPACE CONSUMING PROCESS
24
45
FAIR SPACE CONSUMPTION
30
REQUEST FOR SPACE CONSUMPTION
40
FAIRNESS FILTER ORDERING SCHEME
50
SPACE CONSUMPTION
65
FREE SPACE & EFFICIENTLY USED SPACE
POOL OF STORAGE SPACE
25
55
AMOUNT OF FREE SPACE AVAILABLE
67
SPACE MANAGER
OBTAIN FREE SPACE & INEFFICIENTLY USED SPACE
60

1. A storage management system for a storage means, comprising:

(a) sensing means for sensing a need for generation of free storage space in the storage means;

(b) generating means for generating the free storage space responsive to the sensing means, wherein the free storage space is generated from inefficiently used storage space in the storage means; and,

(c) control means for controlling allocation of the free storage space in the storage means according to an allocation ordering scheme, wherein the allocation is requested by competing storage space consumers and the control means allows the competing consumers to allocate requested amounts of storage space at moments in time determined by indicia identified by the allocation ordering scheme.

5,463,777

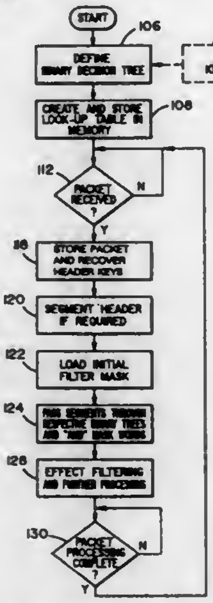
SYSTEM FOR SEGMENTING DATA PACKETS TO FORM BINARY DECISION TREES WHICH DETERMINE FILTER MASKS COMBINED TO FILTER THE PACKETS FOR FORWARDING

Jan Bialkowski, Nashua, N.H., and John Krawczyk, Watertown, Mass., assignors to Wellfleet Communications, Bedford, Mass.

Continuation of Ser. No. 908,248, Jul. 2, 1992, abandoned. This application Feb. 28, 1995, Ser. No. 396,374

Int. Cl.^{6} G06F *17/30*

U.S. Cl. 395—600 **24 Claims**


START
106
104
DEFINE BINARY DECISION TREE
USER/ KEYBOARD
CREATE AND STORE LOOK-UP TABLE IN MEMORY
108
112
PACKET RECEIVED ?
N
Y
118
STORE PACKET AND RECOVER HEADER KEYS
120
SEGMENT HEADER IF REQUIRED
122
LOAD INITIAL FILTER MASK
124
PASS SEGMENTS THROUGH RESPECTIVE BINARY TREES AND "AND" MASK WORDS
126
EFFECT FILTERING AND FURTHER PROCESSING
130
PACKET PROCESSING COMPLETE ?
N
Y

1. A method for processing a data communications binary data packet for forwarding said packet to a next destination within a data communications network, said packet including a data portion and an information containing portion having keys, each key having a data value, comprising the steps of

segmenting said information containing portion into a plurality of information subset segments, each segment associated with at least one of said keys,

creating and storing a binary tree decision table associated with each of said segments, each of said binary tree decision tables having a plurality of non-final nodes, and a plurality of final nodes, each of the tables representing a binary decision tree structure,

processing each of said information subset segments using the associated binary tree decision tables to determine a filter mask for each segment,

combining the results of each filter mask to provide a final filter mask for determining data processing to be used for said packet for filtering and forwarding said packet to a next destination on the basis of the data values of the keys being within preselected ranges of data values, and

processing said packet in accordance with the processing results using said final filter mask.

5,463,778

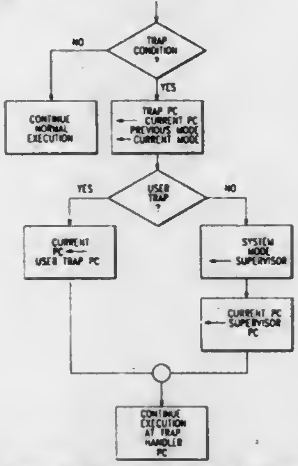
USER CONTROLLED TRAP HANDLER

Douglas A. Johnson, Carrollton, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 871,594, Apr. 16, 1992, abandoned, which is a continuation of Ser. No. 438,386, Nov. 16, 1989, abandoned. This application Sep. 2, 1993, Ser. No. 116,102

Int. Cl.^{6} G06F *9/00*

U.S. Cl. 395—775 **14 Claims**


TRAP CONDITION ?
NO
YES
CONTINUE NORMAL EXECUTION
TRAP PC ← CURRENT PC
PREVIOUS MODE ← CURRENT MODE
USER TRAP ?
YES
NO
CURRENT PC ← USER TRAP PC
SYSTEM MODE ← SUPERVISOR
CURRENT PC ← SUPERVISOR PC
CONTINUE EXECUTION AT TRAP HANDLER PC

1. A data processing system having at least two protection modes of operation, and trap handling for at least two groups of trap conditions, each trap condition having a corresponding trap type, said data processing system comprising:

means for detecting the trap conditions, and a trap handler for handling traps in a first one of said groups without changing the protection mode of operation from the mode of operation in which said data processing system operated when a trap condition occurred to continue to deny access to a protected area of data processing system, and wherein said trap handler comprises means for handling traps in a second one of said group by changing the protection mode to permit access to said protected area of said data process system.

DESIGNS

OCTOBER 31, 1995

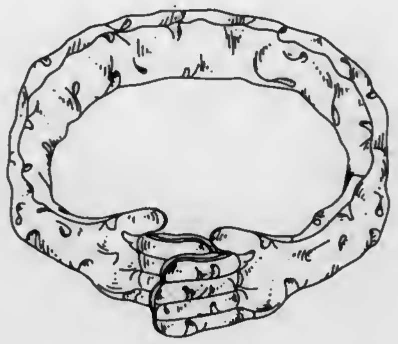
363,591
NECKWEAR

Lorraine Kaul, 56 Balcom Rd., Foster, R.I. 02825

Filed Jun. 17, 1994, Ser. No. 24,638

Term of patent 14 years

U.S. Cl. D2—604



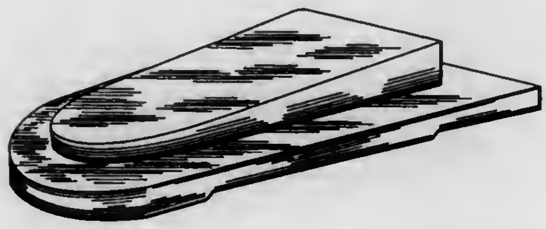
363,592
STRAP STOPPER

Danny Gold, 27 Barker Street, Apt. E/2, Hong Kong, Hong Kong

Filed Jun. 14, 1994, Ser. No. 24,415

Term of patent 14 years

U.S. Cl. D2—639



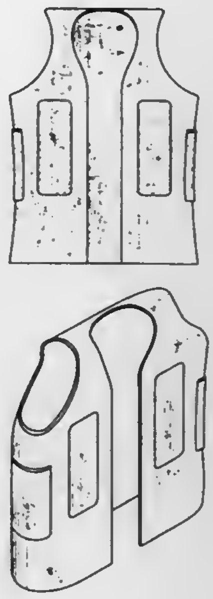
363,593
VEST

Michael J. Murray, and Anita C. Murray, both of 23 Irene St., Springfield, Mass. 01108

Filed Jan. 31, 1994, Ser. No. 18,149

Term of patent 14 years

U.S. Cl. D2—829



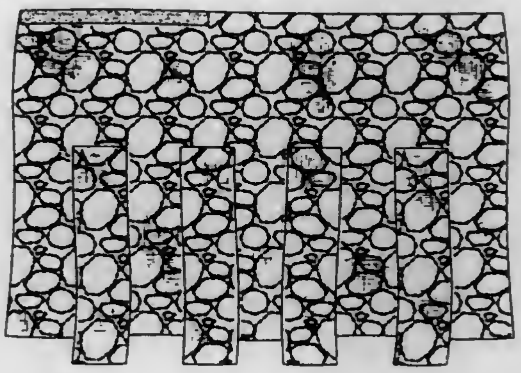
363,594
CAMOUFLAGE SKIRT

Howard W. Nethken, Jr., Rte. 3 Box 107B, Elkins, W. Va. 26241

Filed Jul. 25, 1994, Ser. No. 26,351

Term of patent 14 years

U.S. Cl. D2—852



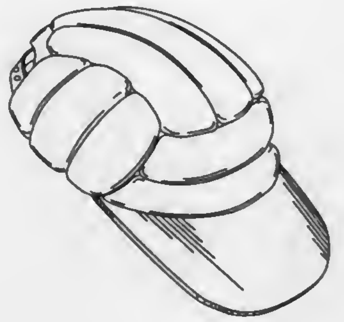
363,595
SPORTS BALL CAP

Michael R. Love, and Alisha M. Love, both of 19444 Prevost, Detroit, Mich. 48235

Filed Sep. 12, 1994, Ser. No. 28,255

Term of patent 14 years

U.S. Cl. D2—869



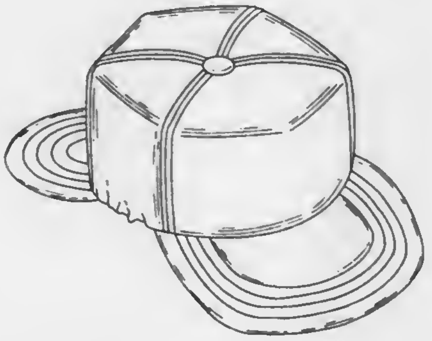
363,596
CAP

Nelson F. Martinez, 12455 Oak Knoll Rd. #1-0, Poway, Calif. 92064

Filed Dec. 15, 1992, Ser. No. 2,650

Term of patent 14 years

U.S. Cl. D2—884



363,597
SUN AND PRIVACY SCREEN

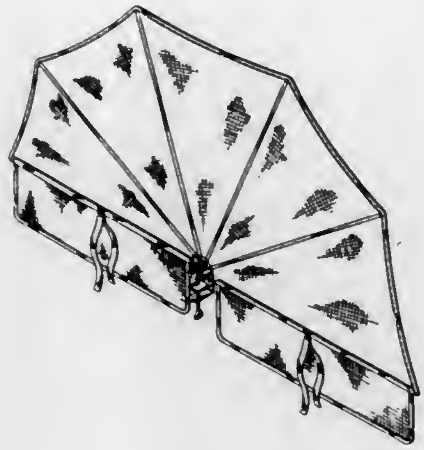
Barbara Byrne, 5748 S. Narragansett, Chicago, Ill. 60638

Continuation-in-part of Ser. No. 8,225, May 12, 1993. This application Jul. 9, 1993, Ser. No. 10,539

The portion of the term of this patent subsequent to Jun. 13, 2009, has been disclaimed.

Term of patent 14 years

U.S. Cl. D3—5



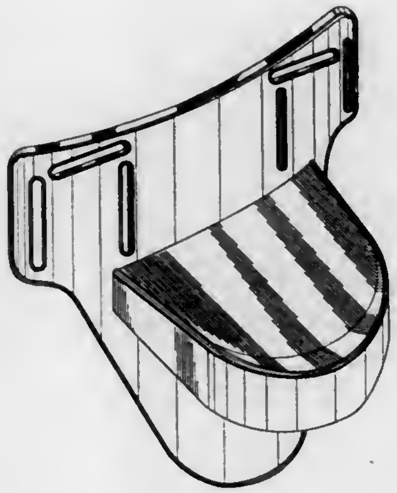
363,598
CHILD CARRIER

Robert M. Walters, and Judith M. Walters, both of 2821 Alta Vista Dr., Newport Beach, Calif. 92660

Filed Jun. 1, 1993, Ser. No. 8,912

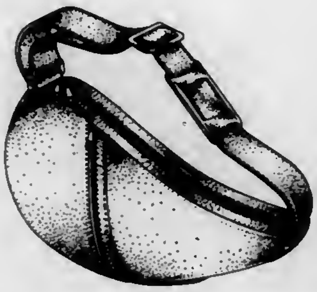
Term of patent 14 years

U.S. Cl. D3—215



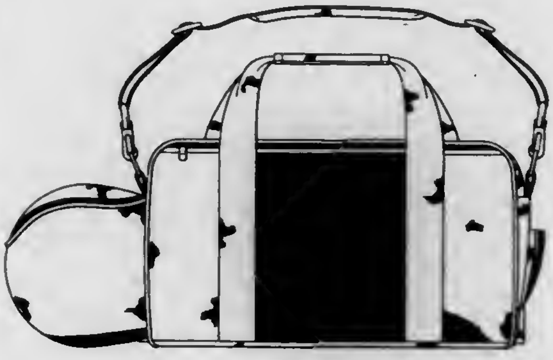
363,599
SHOULDER BAG

Irwin Gaffin, P.O. Box 1355, Olivebridge, N.Y. 12461
Filed Apr. 28, 1994, Ser. No. 22,055
Term of patent 14 years
U.S. Cl. D3—246



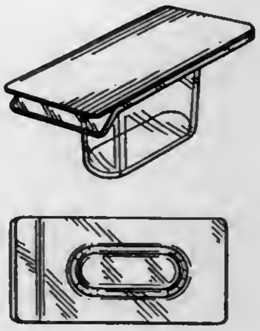
363,600
PERSONAL SPORT BAG

Curtis A. Medlen, 4203 S. Terra Verde, Veradale, Wash. 99037
Filed Apr. 19, 1994, Ser. No. 21,489
Term of patent 14 years
U.S. Cl. D3—254



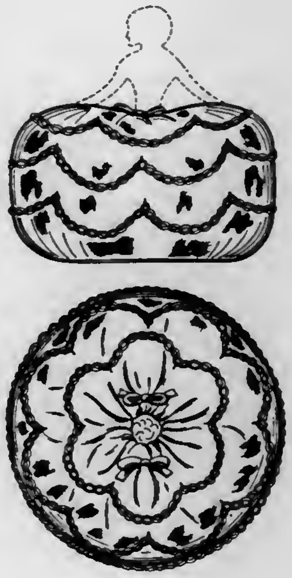
363,601
PACKAGE FOR A CONTACT LENS

Richard W. Abrams; Russell J. Crossman, both of Jacksonville, Fla., and Charles R. Ashley, Asbury, N.J., assignors to Johnson & Johnson Vision Products, Inc., Jacksonville, Fla.
Filed Apr. 21, 1994, Ser. No. 21,794
Term of patent 14 years
U.S. Cl. D3—264



363,602
EARRING AND PIN DISPLAY

Doris L. Asher, 315 Keystone, River Forest, Ill. 60305
Filed Mar. 11, 1993, Ser. No. 5,810
Term of patent 14 years
U.S. Cl. D3—270



363,603

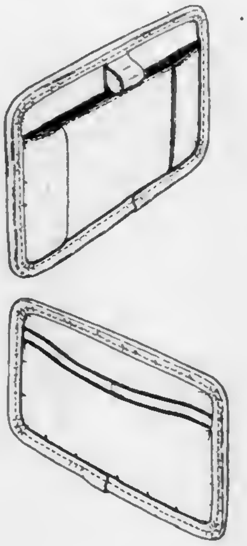
PORTFOLIO

Steven Leveen; Lori G. Leveen, both of Boca Raton; Israel Pycher, Plantation; Chris Roncone, Lake Worth, and Laura McColskey, Palm Beach Gardens, all of Fla., assignors to Levenger Company, Delray Beach, Fla.

Filed Oct. 5, 1993, Ser. No. 14,092

Term of patent 14 years

U.S. Cl. D3—303



363,604

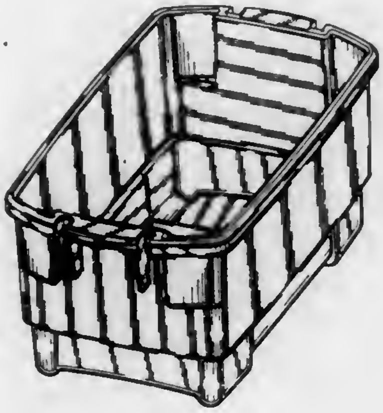
STORAGE CONTAINER

John W. Koenig; Peter A. Koloski, both of Columbus, and Stacy L. Wolff, Akron, all of Ohio, assignors to Rubbermaid Incorporated, Wooster, Ohio

Filed Aug. 12, 1994, Ser. No. 27,059

Term of patent 14 years

U.S. Cl. D3—312



363,605

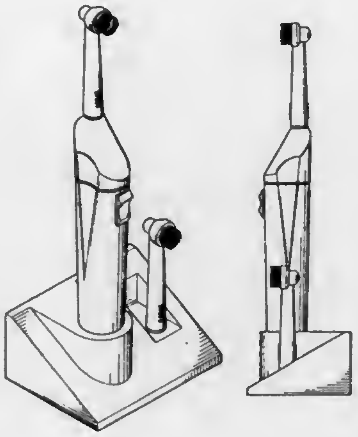
COMBINED ELECTRIC TOOTHBRUSH SET AND STAND

Tony Kou, 2Fl., 14, Sublane 1, Lane 94, Ta Chih Street, and C. S. Yang, 6Fl., 41, Lane 228, Ho Ping East Road, Sec. 3, both of Taipei, Taiwan, Prov. of China

Filed Sep. 27, 1993, Ser. No. 13,502

Term of patent 14 years

U.S. Cl. D4—101



363,606

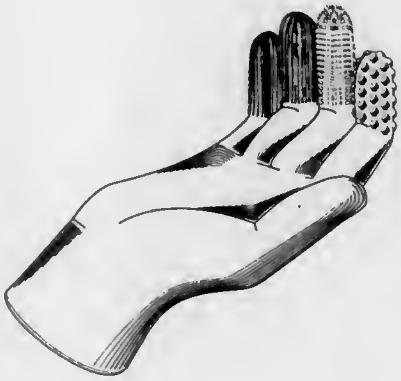
GLOVE FOR USE IN ORAL STIMULATION

Marilyn F. Abrahamson, 17 Woodland Cir., Manalapan, N.J. 07726

Filed Apr. 4, 1994, Ser. No. 20,840

Term of patent 14 years

U.S. Cl. D4—103



363,607

TOOTHBRUSH WITH CAP

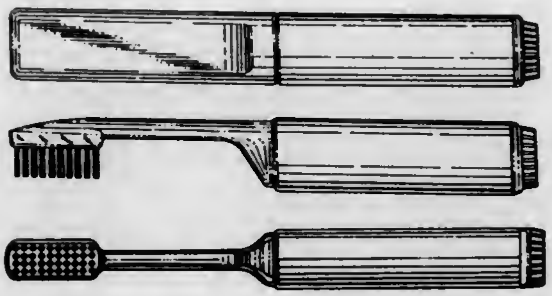
David R. Collins, Lichfield, and Andrew Calloway, Tamworth, both of, England, assignors to Trisport Limited, Tamworth, England

Filed Sep. 20, 1993, Ser. No. 13,107

Claims priority, application United Kingdom, Mar. 20, 1993, 2 029 901

Term of patent 14 years

U.S. Cl. D4—108



363,608

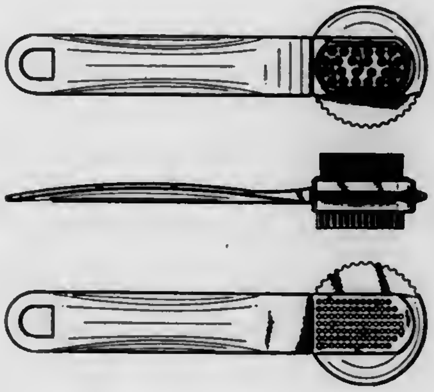
COMBINED SUEDE BRUSH AND SCRAPER

Jurgen Lessmann, Oettingen, Germany, assignor to Lessmann GmbH, Germany

Filed Dec. 15, 1993, Ser. No. 16,425

Term of patent 14 years

U.S. Cl. D4—118



363,609

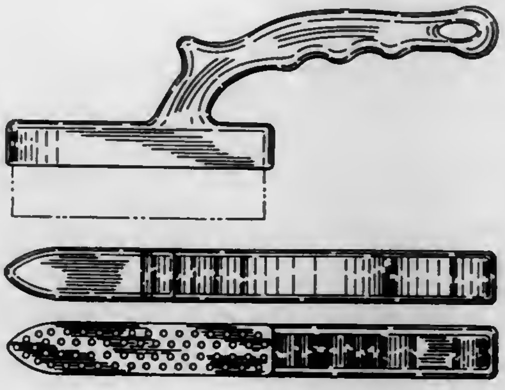
SCRATCH BRUSH HANDLE

Bruce Bochnak, and Scott E. Rutledge, both of Wooster, Ohio, assignors to The Wooster Brush Company, Wooster, Ohio

Filed Jul. 1, 1993, Ser. No. 10,211

Term of patent 14 years

U.S. Cl. D4—138



363,610

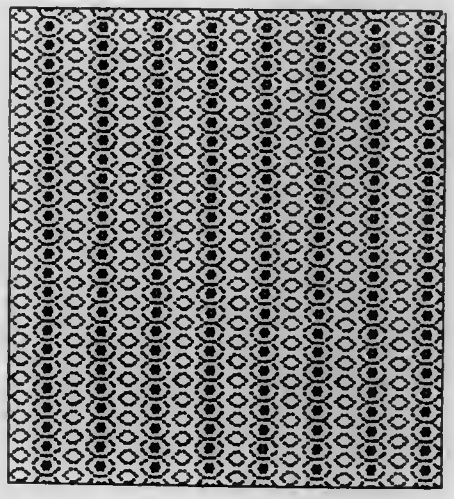
EMBOSSED PAPER TOWEL

Kenneth E. Saffran, and James C. Scovell, both of Green Bay, Wis., assignors to Fort Howard Corporation, Green Bay, Wis.

Filed Sep. 12, 1994, Ser. No. 28,325

Term of patent 14 years

U.S. Cl. D5—53



363,611

SYNTHETIC RESIN CLOTH MATERIAL

Junji Nakamura, Tokyo, Japan, assignor to Onward Kashiyama Company Limited, Tokyo, Japan

Filed May 17, 1993, Ser. No. 8,478

Term of patent 14 years

U.S. Cl. D5—60

363,612

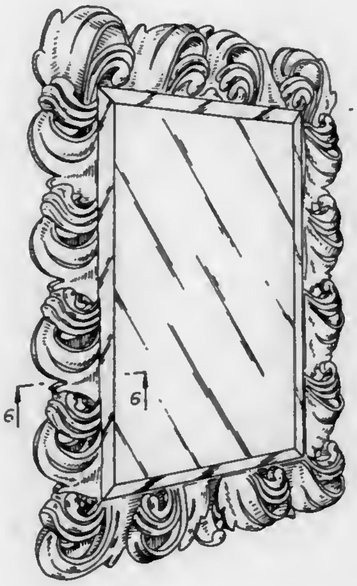
MIRROR

Sally S. Lewis, 8727 Melrose Ave., Los Angeles, Calif. 90069-5086

Filed Mar. 21, 1994, Ser. No. 20,150

Term of patent 14 years

U.S. Cl. D6—300



363,613

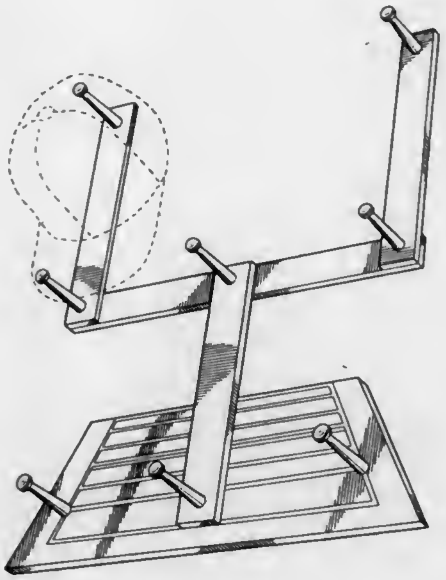
SPORTS CAP RACKS FOR RETAINING FOOTBALL CAPS

Ronald S. Ehrmann, 5808 Devonshire Dr., Bethesda, Md. 20816

Filed Mar. 8, 1993, Ser. No. 5,631

Term of patent 14 years

U.S. Cl. D6—316



363,614

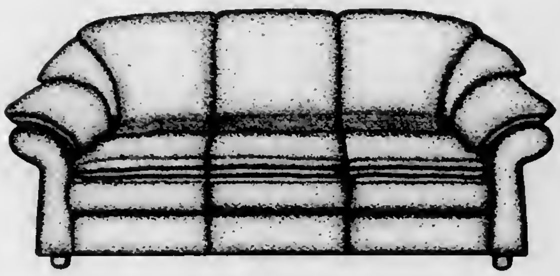
SOFA

Pasquale Natuzzi, and Raffaella Lucarelli, both of Santeramo In Colle, Italy, assignors to Industrie Natuzzi Spa, Bari, Italy

Filed Dec. 15, 1993, Ser. No. 16,446

Term of patent 14 years

U.S. Cl. D6—381



363,615

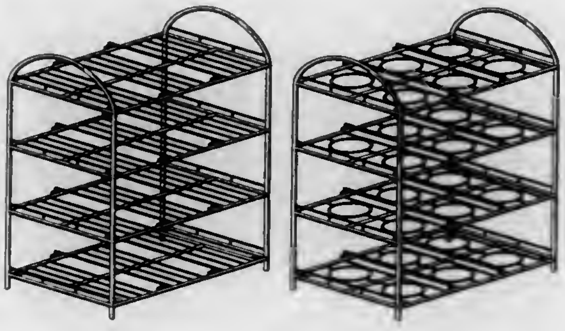
PLANT AND FLOWER STAND

Mike J. Vukelich, Sr., P.O. Box 20060, El Sobrante, Calif. 94820

Filed Apr. 26, 1994, Ser. No. 21,929

Term of patent 14 years

U.S. Cl. D6—405



363,616

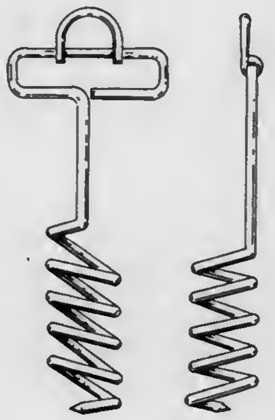
GROUND INSERTED HELICAL STAFF SUPPORT

Andrew J. Allen, 1735 LeGaye Dr., Cardiff, Calif. 92007

Filed Dec. 13, 1993, Ser. No. 16,271

Term of patent 14 years

U.S. Cl. D6—417



363,617

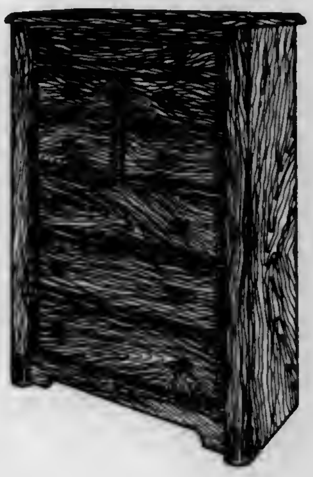
DRESSER

Michael J. Paus, High Point, N.C., assignor to Universal Furniture Industries, Inc., High Point, N.C.

Filed Mar. 25, 1994, Ser. No. 20,428

Term of patent 14 years

U.S. Cl. D6—445



363,618

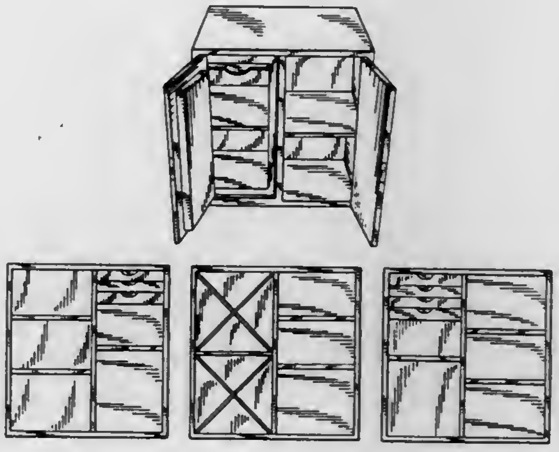
CABINET

Charlotte Cramer, 381 Park Ave. South, New York, N.Y. 10016

Filed Mar. 28, 1994, Ser. No. 20,516

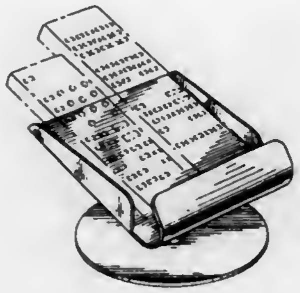
Term of patent 14 years

U.S. Cl. D6—446



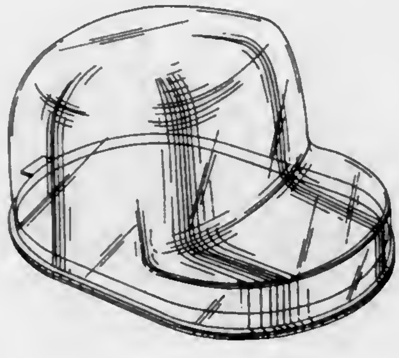
363,619
REMOTE CONTROL HOLDER FOR ELECTRONIC EQUIPMENT

Christopher Karnaze, 39 Pond St., San Francisco, Calif. 94114
Filed Jul. 18, 1994, Ser. No. 25,948
Term of patent 14 years
U.S. Cl. D6—449



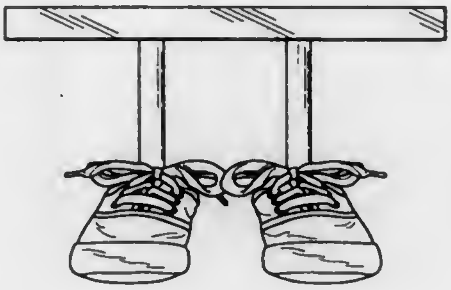
363,620
CAP PROTECTOR

Richard M. Schweppe, 3136 W. Alvina, Greenfield, Wis. 53221
Filed Oct. 21, 1994, Ser. No. 30,021
Term of patent 14 years
U.S. Cl. D6—450



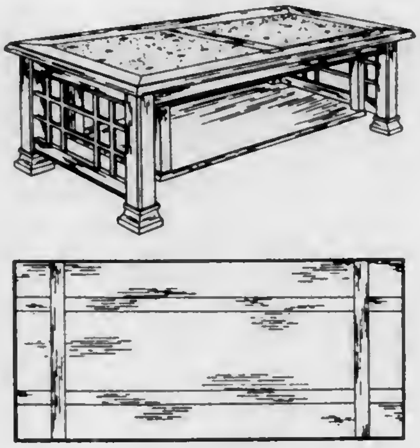
363,621
COMPUTER MONITOR STAND

Matthew S. Eatherly, 13508 Fox Hollow, Oklahoma City, Okla. 73131
Filed Dec. 6, 1994, Ser. No. 31,819
Term of patent 14 years
U.S. Cl. D6—450



363,622
TABLE

Guy A. Walters, III, High Point, and Avis E. Tobin, Jr., Thomasville, both of N.C., assignors to Thomasville Furniture Industries, Inc., Thomasville, N.C.
Filed Oct. 20, 1994, Ser. No. 29,995
Term of patent 14 years
U.S. Cl. D6—477



363,623

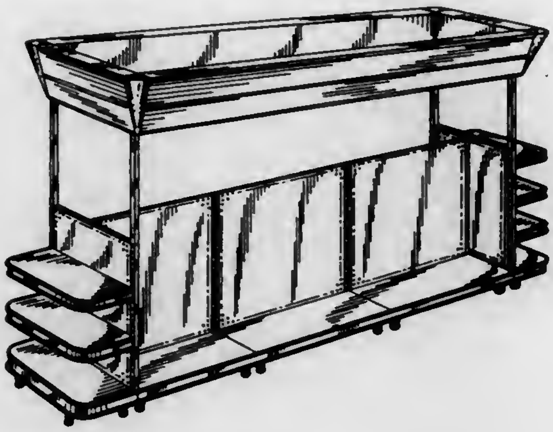
DISPLAY STAND

Tom Rushing, Denville, N.J., assignor to HMG Worldwide In-Store Marketing, Inc., New York, N.Y.

Filed Apr. 29, 1993, Ser. No. 7,751

Term of patent 14 years

U.S. Cl. D6—479



363,624

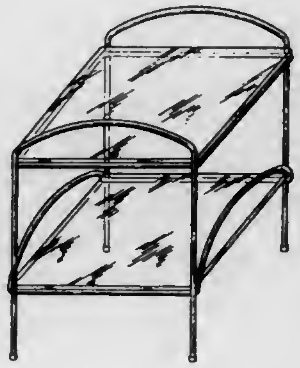
TWO TIERED TABLE

Bart J. Levine, 4420 S. Wolcott Ave., Chicago, Ill. 60609

Filed Feb. 1, 1994, Ser. No. 18,206

Term of patent 14 years

U.S. Cl. D6—479



363,625

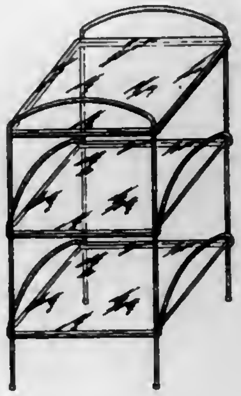
THREE TIERED TABLE

Bart J. Levine, 4420 S. Wolcott Ave., Chicago, Ill. 60609

Filed Feb. 1, 1994, Ser. No. 18,207

Term of patent 14 years

U.S. Cl. D9—479



363,626

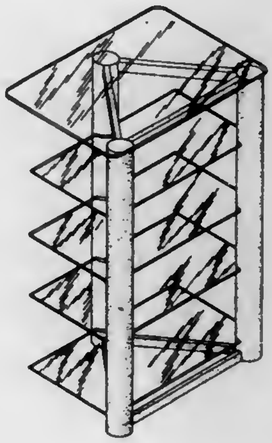
ENTERTAINMENT SYSTEM STAND

Jon P. Herbst, 2890 Skyline Dr., Eagan, Minn. 55121

Filed Oct. 25, 1994, Ser. No. 30,274

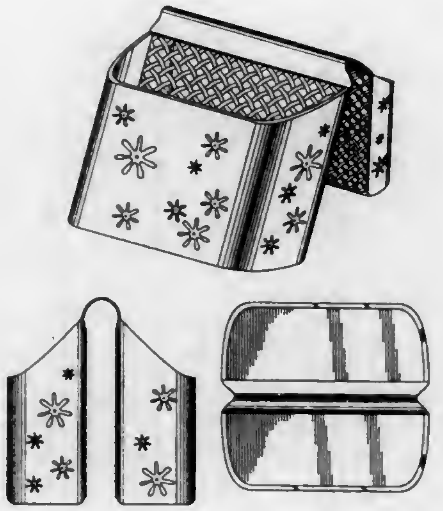
Term of patent 14 years

U.S. Cl. D6—479



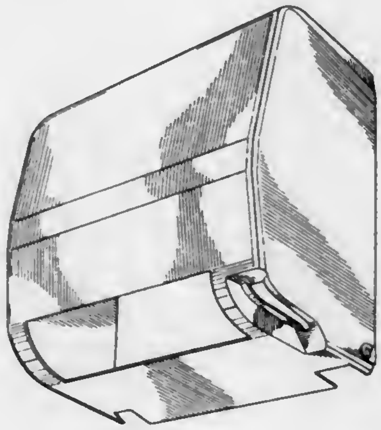
363,627
SINK CADDY

Fran North, Rte. 3,07 587 576A, Montpelier, Ohio 43543
Filed Sep. 23, 1994, Ser. No. 28,854
Term of patent 14 years
U.S. Cl. D6—513



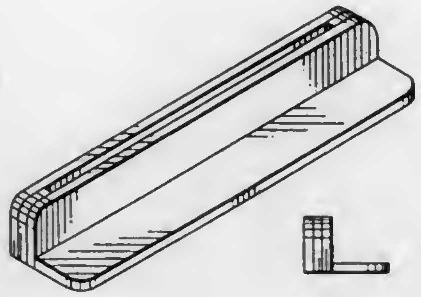
363,628
ROLL PRODUCTS DISPENSER CASING

Forrest S. McCanless, Oxford, Ga., assignor to Georgia-Pacific Corporation, Atlanta, Ga.
Filed Dec. 30, 1994, Ser. No. 32,875
Term of patent 14 years
U.S. Cl. D6—522



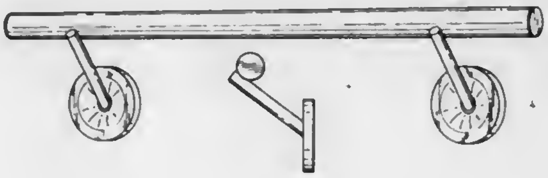
363,629
TUBE SQUEEZER

Charles H. Bost, 1520 Eckert Ave., Winter Haven, Fla. 33881
Filed Oct. 19, 1994, Ser. No. 29,920
Term of patent 14 years
U.S. Cl. D6—541



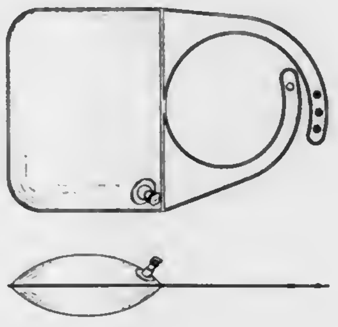
363,630
TOWEL RAIL

Philippe Starck, Montfort L'Amaury, France, assignor to Hans Grohe GmbH & Co. KG, Germany
Filed Aug. 4, 1994, Ser. No. 26,706
Claims priority, application Germany, Feb. 8, 1992, 94 01 167.2
Term of patent 14 years
U.S. Cl. D6—549



363,631
INFLATABLE MECHANIC'PILLOW

Jessie A. Hobbs, 14191 Cornishcrest, Whittier, Calif. 90604
Filed Jan. 23, 1995, Ser. No. 33,846
Term of patent 14 years
U.S. Cl. D6—604



363,632
CASSETTE CASE

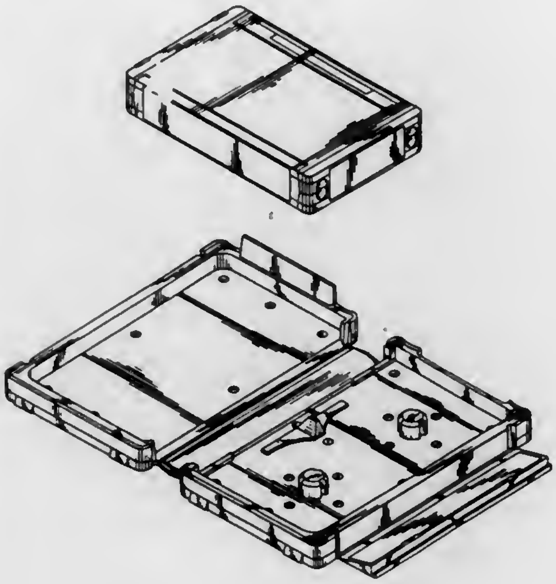
Takashi Ohta, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Sep. 13, 1994, Ser. No. 28,341

Claims priority, application Japan, Mar. 14, 1994, 6-6228

Term of patent 14 years

U.S. Cl. D6—634



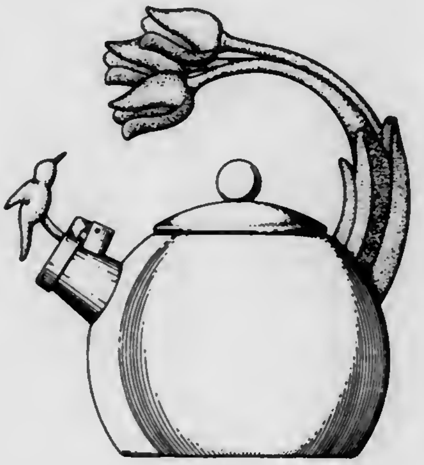
363,633
KETTLE

Bruce Ancona; Jane Ancona; Mary J. DeGuzman, all of New York, N.Y., and Edward H. Kilduff, Weehawken, N.J., assignors to B. Via International Housewares, Inc., Englewood Cliffs, N.J.

Filed Aug. 5, 1994, Ser. No. 26,786

Term of patent 14 years

U.S. Cl. D7—302



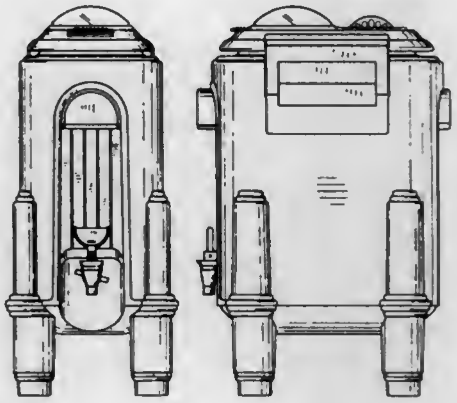
363,634
BEVERAGE DISPENSER

Robert J. Cohn, Dallas, Pa., assignor to Cambro Manufacturing Company, Huntington Beach, Calif.

Filed Jul. 11, 1994, Ser. No. 25,729

Term of patent 14 years

U.S. Cl. D7—306



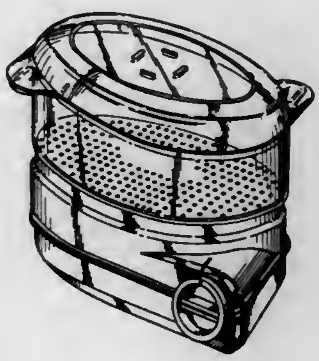
363,635
VEGETABLE STEAMER

Sally K. Cashin, Wauwatosa, Wis., and William C. Cesaroni, Glenview, Ill., assignors to The West Bend Company, West Bend, Wis.

Filed Aug. 11, 1993, Ser. No. 11,683

Term of patent 14 years

U.S. Cl. D7—354



363,636
EGG POACHER

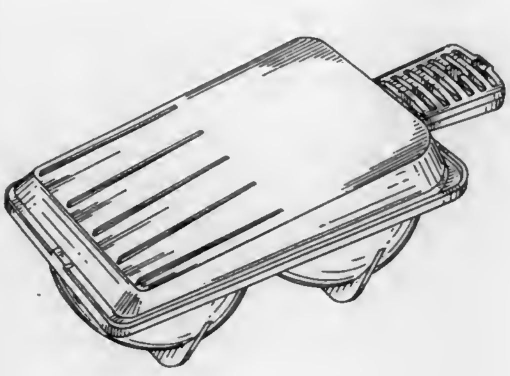
Jhi H. Leung, Kowloon, Hong Kong, assignor to Star Industrial Co., Ltd., Kowloon, Hong Kong

Filed Jun. 10, 1993, Ser. No. 9,452

Claims priority, application United Kingdom, Dec. 23, 1992, 2027976

Term of patent 14 years

U.S. Cl. D7—357



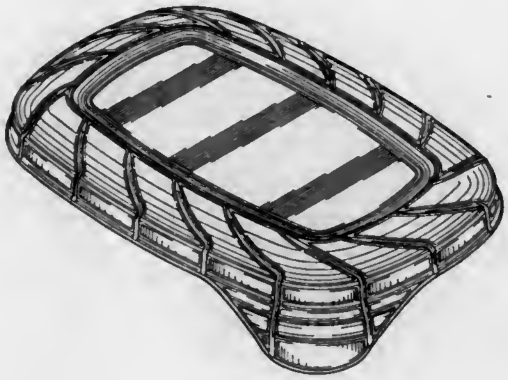
363,638
FOOD STORAGE CONTAINER LID

David L. Feer, Andover, Mass., assignor to Rubbermaid Incorporated, Wooster, Ohio

Filed Aug. 9, 1994, Ser. No. 26,919

Term of patent 14 years

U.S. Cl. D7—391



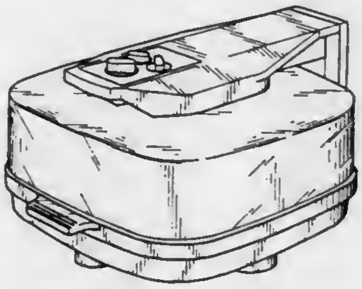
363,637
AIR FRYER

Li-Hsia Chang, No. 16-1, Lane 742, San Feng Rd., Feng Yuan City, Taichung Hsein, Taiwan, Prov. of China

Filed Jan. 19, 1993, Ser. No. 3,735

Term of patent 14 years

U.S. Cl. D7—358



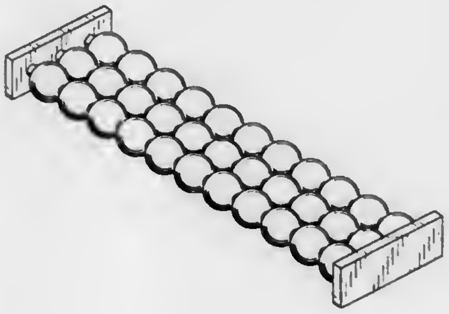
363,639
STEAM GENERATOR FOR A BATCH OVEN

Serge C. Vallee, Drummondville, Canada, assignor to Premark FEG Corporation, Wilmington, Del.

Filed Oct. 22, 1993, Ser. No. 14,525

Term of patent 14 years

U.S. Cl. D7—402



363,640

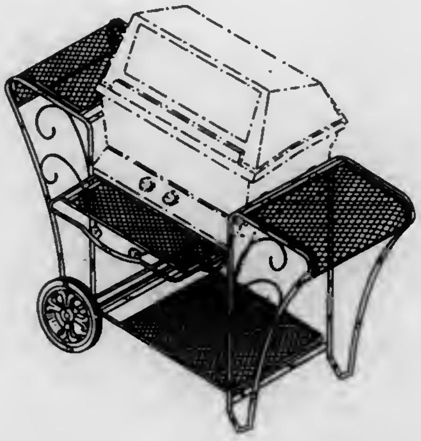
COMBINED GRILL CART WITH A DROP TABLE AND A LOWER SHELF

William King, Neosho; Andy Hill, Joplin, both of Mo., and Glen Kemnitz, Gallatin, Tenn., assignors to Sunbeam Corporation, Fort Lauderdale, Fla.

Filed Nov. 19, 1993, Ser. No. 16,650

Term of patent 14 years

U.S. Cl. D7—403



363,641

CUP WITH LID

Toru Goto, and Yukari Kawamura, both of Tokyo, Japan, assignors to Nippon Sanso Corporation, Tokyo, Japan

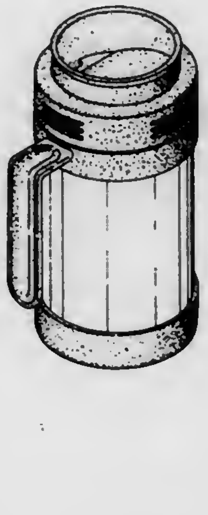
Filed Feb. 25, 1994, Ser. No. 19,199

Claims priority, application Japan, Aug. 31, 1993, 5-26367

The portion of the term of this patent subsequent to Oct. 24, 2009, has been disclaimed.

Term of patent 14 years

U.S. Cl. D7—511



363,642

CUP WITH LID

Toru Goto, and Yukari Kawamura, both of Tokyo, Japan, assignors to Nippon Sanso Corporation, Tokyo, Japan

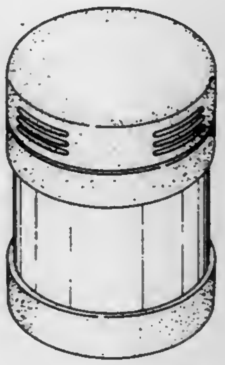
Filed Feb. 25, 1994, Ser. No. 19,250

Claims priority, application Japan, Aug. 31, 1993, 5-26368

The portion of the term of this patent subsequent to Oct. 24, 2009, has been disclaimed.

Term of patent 14 years

U.S. Cl. D7—511



363,643

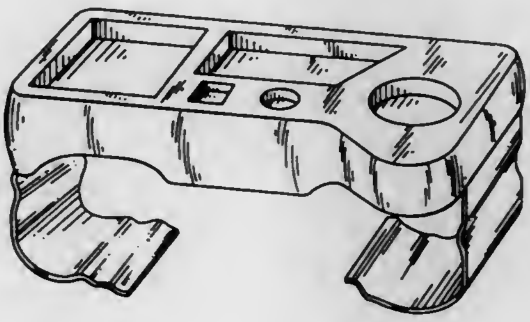
FAST FOOD LAP TRAY

Seth G. Eisenberg, 1207 Heather Hill Crescent, Flossmoor, Ill. 60422

Filed May 26, 1994, Ser. No. 23,535

Term of patent 14 years

U.S. Cl. D7—553



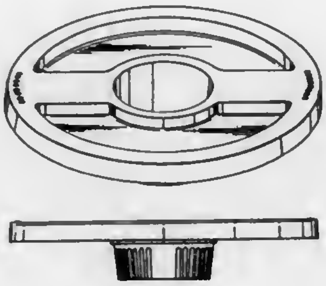
363,644
PARTY TRAY

William B. Wyatt, Brentwood, and Steven A. Silverstein, Nashville, Tenn., assignors to Aladdin Synergetics, Inc., Nashville, Tenn.

Filed Aug. 5, 1994, Ser. No. 26,807

Term of patent 14 years

U.S. Cl. D7—553



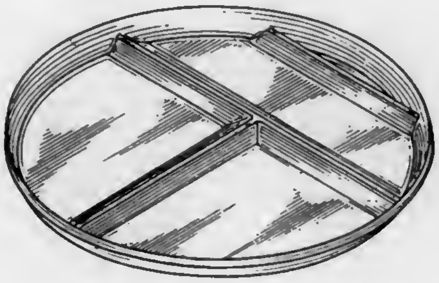
363,645
HOT DOG PLATE PLUS FOOD COMPARTMENTS

Bette E. Smith, 23681 Posey La., West Hills, Calif. 91304

Filed Jun. 13, 1994, Ser. No. 24,285

Term of patent 14 years

U.S. Cl. D7—555



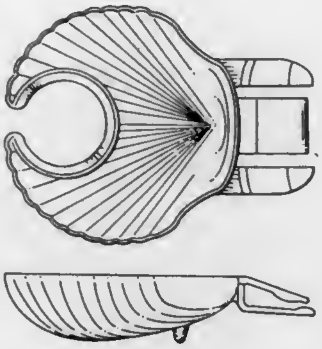
363,646
CLIP-ON SEA SHELL SHAPED BEVERAGE HOLDER FOR STEMMED GLASSWARE

Ramona C. Wong, 1860 Ala Moana Blvd., #1206, Honolulu, Hi. 96815

Filed Aug. 15, 1994, Ser. No. 27,158

Term of patent 14 years

U.S. Cl. D7—556



363,647
COMBINED FOOD CONTAINER AND TOY BUILDING BLOCK CONNECTORS

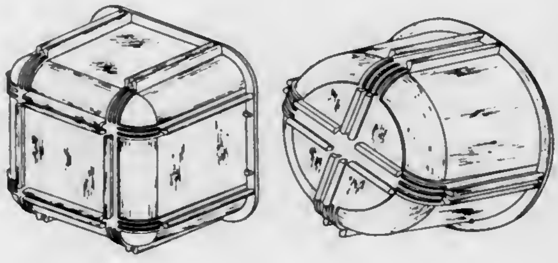
Eitan Rivlin, 22 Zondak st., Jerusalem, and Yossl Walker, 15 Hagoren st., Efrat, both of, Israel

Filed Jul. 12, 1993, Ser. No. 10,614

Claims priority, application Israel, Jan. 12, 1993, 20337

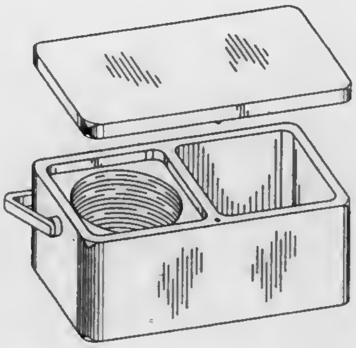
Term of patent 14 years

U.S. Cl. D7—602



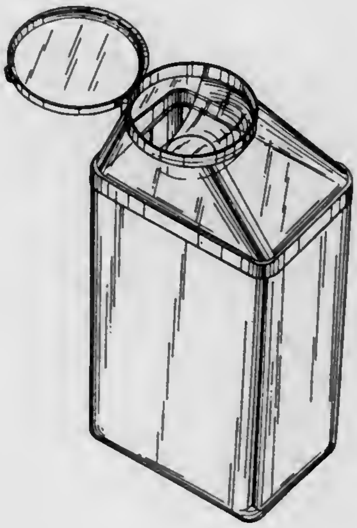
363,648
INSULATED COVERED SALAD COOLER

Leonard E. O'Brien, 130 Hwy. 47, Winfield, Mo. 63389
Filed Aug. 8, 1994, Ser. No. 26,879
Term of patent 14 years
U.S. Cl. D7—605



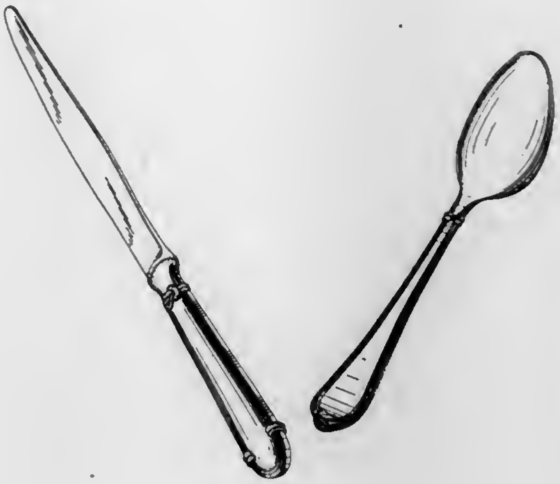
363,649
DISPENSING CONTAINER

Edward Robbins, III, 2802 E. Avalon Ave., Muscle Shoals, Ala. 35661
Filed Jul. 26, 1994, Ser. No. 26,369
Term of patent 14 years
U.S. Cl. D7—612



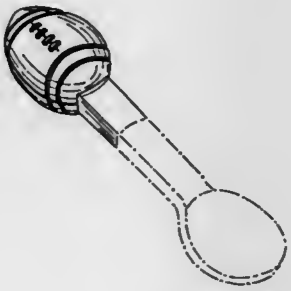
363,650
FLATWARE

Henri Bouilhet, Paris, France, assignor to Orfevrerie Christofle, Paris, France
Filed Feb. 22, 1994, Ser. No. 19,035
Claims priority, application France, Jan. 12, 1993, 935219
Term of patent 14 years
U.S. Cl. D7—645



363,651
HANDLE FOR FORK, SPOONS AND TOOTHBRUSHES

Susan Harrison, Wichita Falls, Tex., assignor to Zooth, Inc., Wichita Falls, Tex.
Continuation-in-part of Ser. No. 3,463, Jan. 12, 1993, Pat. No. 5,269,420. This application Oct. 22, 1993, Ser. No. 14,496
Term of patent 14 years
U.S. Cl. D7—654

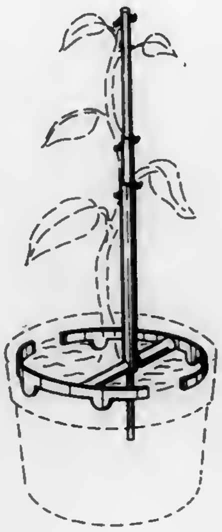


363,652

PLANT SUPPORT

Mary L. Turner, 180 Shell St., Pacifica, Calif. 94044
Filed Feb. 1, 1994, Ser. No. 18,221
Term of patent 14 years

U.S. Cl. D8—1

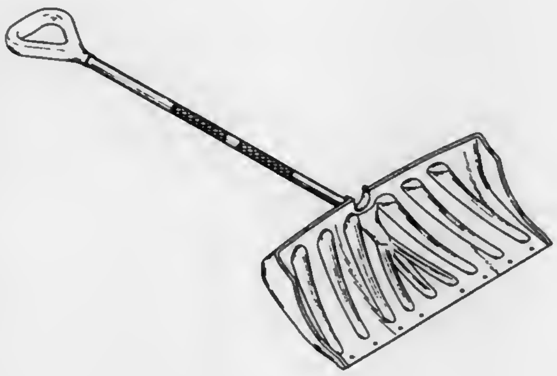


363,653

PUSHER SNOW SHOVEL

Thomas A. Tisbo, Barrington Hills, and Stephen P. Whitehead, Elgin, both of Ill., assignors to Suncast Corporation, Batavia, Ill.
Filed Sep. 12, 1994, Ser. No. 28,308
Term of patent 14 years

U.S. Cl. D8—10

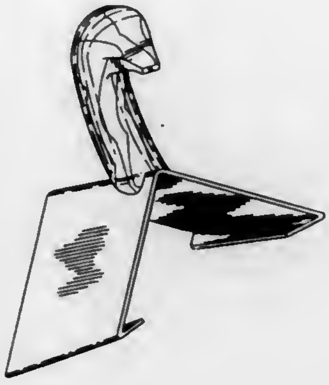


363,654

TOOL FOR OPENING BEVERAGE CONTAINERS

John I. Gander, 1700 Bowman Rd., Lima, Ohio 45804-4219
Filed Feb. 3, 1994, Ser. No. 18,327
Term of patent 14 years

U.S. Cl. D8—14

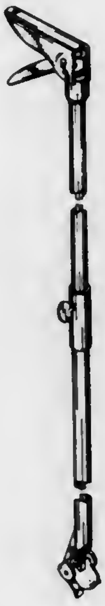


363,655

BOLT GRIPPING TOOL

Raymond E. McDaniel, 2538 N. Fair Oaks Ave., Tucson, Ariz. 85712
Filed May 24, 1994, Ser. No. 23,464
Term of patent 14 years

U.S. Cl. D8—51



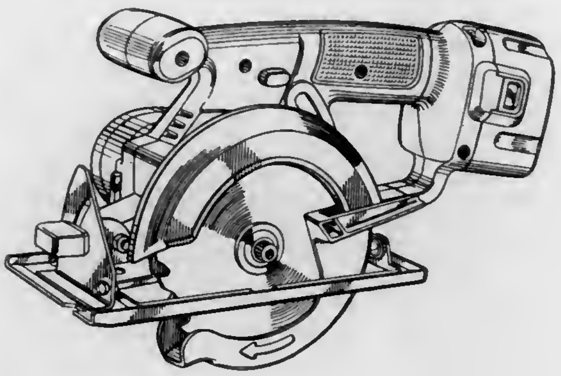
363,656
CORDLESS CIRCULAR SAW

Martin P. Gierke, Baltimore, Md., assignor to Black & Decker Inc., Newark, Del.

Filed Aug. 2, 1994, Ser. No. 26,666

Term of patent 14 years

U.S. Cl. D8—66



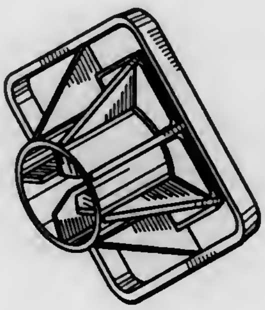
363,657
PROTECTIVE COVER FOR A CONCRETE REINFORCING BAR

Vasken Kassardjian, Newport Beach, and Patrick J. Wilson, Dove Canyon, both of Calif., assignors to Don De Cristo Concrete Accessories, Inc., Irvine, Calif.

Filed May 31, 1994, Ser. No. 23,758

Term of patent 14 years

U.S. Cl. D8—354



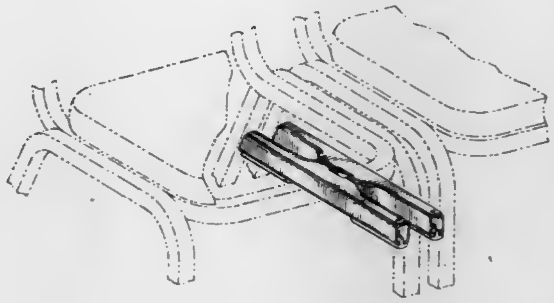
363,658
GANGING MECHANISM FOR CHAIRS

Peter Barile, Morristown, Tenn., assignor to Shelby Williams Industries, Inc., Morristown, Tenn.

Filed Apr. 13, 1994, Ser. No. 21,278

Term of patent 14 years

U.S. Cl. D8—382



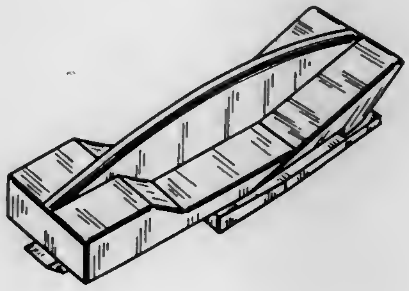
363,659
CLIP FOR A BAND

Dean B. Chenoweth, Minnetonka, Minn., assignor to Advantek, Inc., Minnetonka, Minn.

Filed Apr. 11, 1994, Ser. No. 21,211

Term of patent 14 years

U.S. Cl. D8—382



363,660

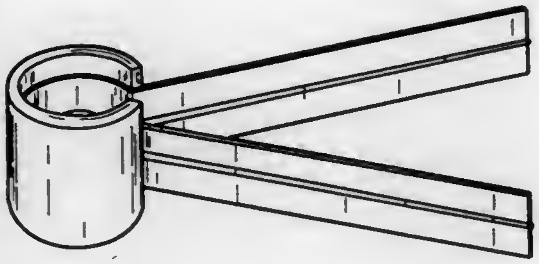
BAG SEALER

Song S. Kim, 10192 Central Ave., Garden Grove, Calif. 92643

Filed Mar. 11, 1994, Ser. No. 19,826

Term of patent 14 years

U.S. Cl. D9—434



363,661

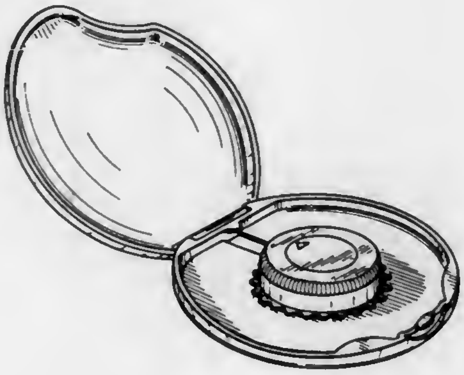
TABLET DISPENSER PACKAGE

Lawrence E. Lambelet, Jr., Flemington, N.J., and Martha Davis, New York, N.Y., assignors to Ortho Pharmaceutical Corporation, Raritan, N.J.

Filed Jul. 29, 1994, Ser. No. 26,853

Term of patent 14 years

U.S. Cl. D9—423



363,662

CONTAINER

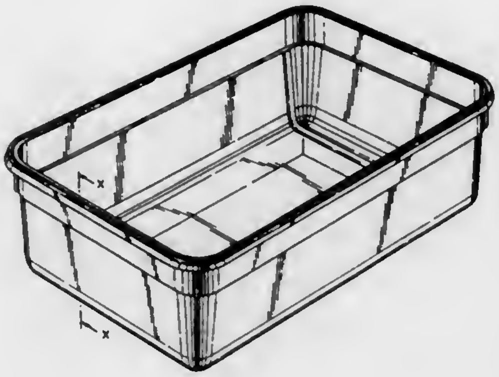
Keith Plater, Northampton, United Kingdom, assignor to Good Humor Corporation, Green Bay, Wis.

Filed Aug. 5, 1994, Ser. No. 26,814

Claims priority, application United Kingdom, Feb. 8, 1994, 2037038

Term of patent 14 years

U.S. Cl. D9—425



363,663

CONTAINER WITH LID

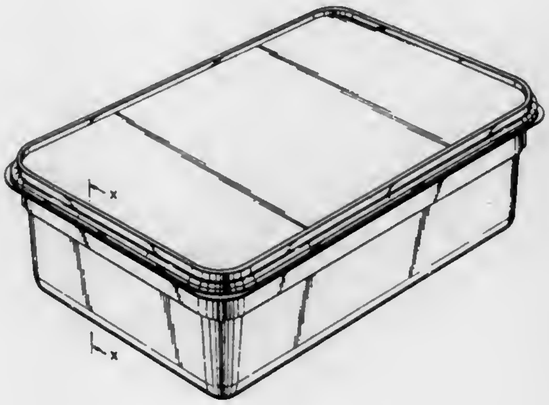
Keith Plater, Northampton, United Kingdom, assignor to Good Humor Corporation, Green Bay, Wis.

Filed Aug. 5, 1994, Ser. No. 26,813

Claims priority, application United Kingdom, Feb. 8, 1994, 2037039

Term of patent 14 years

U.S. Cl. D9—425



363,664

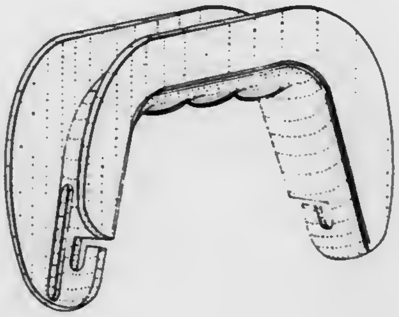
HAND CUSHION

Charles Muchnick, 27 E. Levering Mill Rd., Bala Cynwyd, Pa. 19004

Filed Apr. 14, 1993, Ser. No. 7,097

Term of patent 14 years

U.S. Cl. D9—434



363,665

LID FOR DRINK CONTAINERS

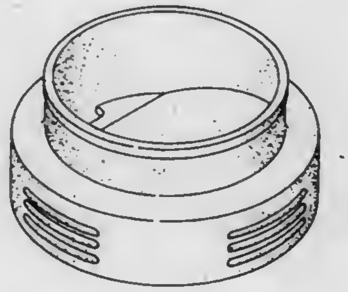
Toru Goto, and Yukari Kawamura, both of Tokyo, Japan, assignors to Nippon Sanso Corporation, Tokyo, Japan

Filed Feb. 28, 1994, Ser. No. 19,306

Claims priority, application Japan, Sep. 28, 1993, 5-29221

Term of patent 14 years

U.S. Cl. D9—434



363,666

LID FOR CONTAINERS

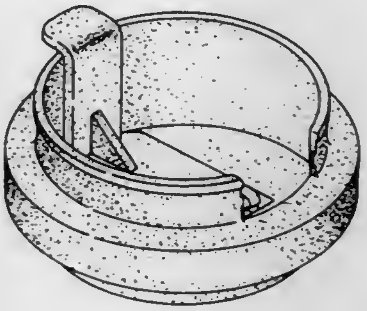
Toru Goto, and Yukari Kawamura, both of Tokyo, Japan, assignors to Nippon Sanso Corporation, Tokyo, Japan

Filed Feb. 28, 1994, Ser. No. 19,309

Claims priority, application Japan, Sep. 28, 1993, 5-29220

Term of patent 14 years

U.S. Cl. D9—449



363,667

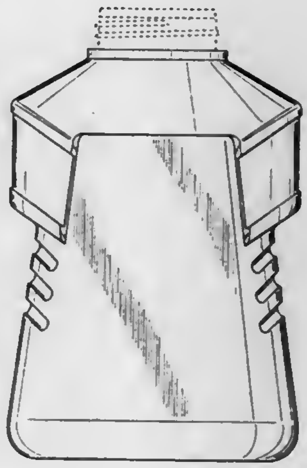
BOTTLE

Georg Baratta-Dragono, San Francisco; Judith C. Webster, Pleasanton; John L. Brown; Antonio Angulo, both of San Francisco; Daniel B. Kiltsner; Joanne Hom, both of Oakland, and P. Storey Jones, San Francisco, all of Calif., assignors to The Clorox Company, Oakland, Calif.

Filed Oct. 13, 1994, Ser. No. 29,686

Term of patent 14 years

U.S. Cl. D9—542



363,668
CONTAINER

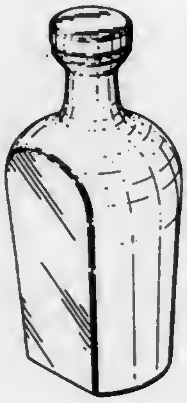
Ralph J. Brough, Tadcaster, and Jack Parker, Redhill, both of, England, assignors to Allied Domecq Spirits & Wine Limited (British Co.), Bedminster Down, England

Filed Dec. 30, 1994, Ser. No. 32,864

Claims priority, application United Kingdom, Jul. 5, 1994, 2040142

Term of patent 14 years

U.S. Cl. D9—544



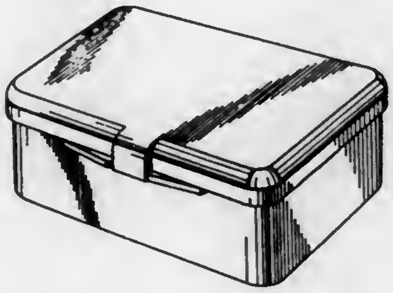
363,669
CONTAINER

Raymond P. Pennoyer, Jr., 97 Sturbridge La., Trumbull, Conn. 06610

Filed May 13, 1994, Ser. No. 22,847

Term of patent 14 years

U.S. Cl. D9—423



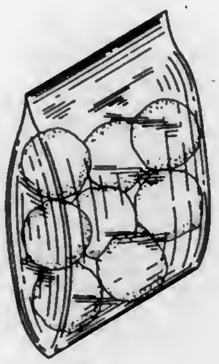
363,670
PACKAGE OF COTTON CANDY BALLS

John T. Sullivan, 3910 Madison St., Hyattsville, Md. 20781

Filed Jun. 18, 1993, Ser. No. 9,570

Term of patent 14 years

U.S. Cl. D9—337



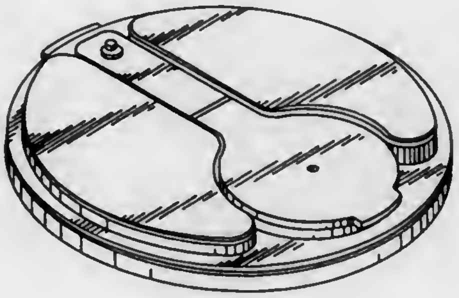
363,671
CLOSURE FOR A CONTAINER

Jonathan H. Mueller, Hermitage, Tenn., assignor to Aladdin Synergetics, Inc., Nashville, Tenn.

Continuation of Ser. No. 7,282, Apr. 21, 1993, abandoned. This application Feb. 1, 1995, Ser. No. 34,332

Term of patent 14 years

U.S. Cl. D9—447



363,672

BANK NOTE DETECTOR

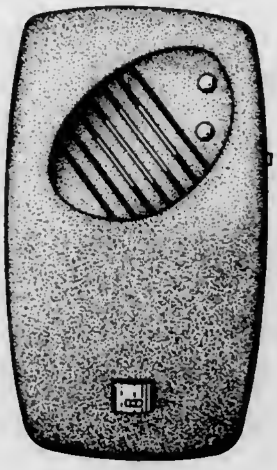
Se Kit Yuen, Kowloon, Hong Kong, assignor to John Manufacturing Limited, Kowloon, Hong Kong

Filed May 18, 1994, Ser. No. 23,105

Claims priority, application United Kingdom, Feb. 21, 1994, 2037271

Term of patent 14 years

U.S. Cl. D10—97



363,673

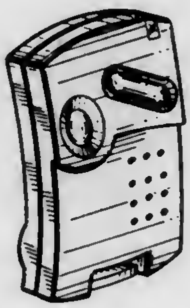
REMOTE CONTROL TRANSMITTER

Mark Dziersk, Simsbury; Kenneth D. Harris, Jr., Hartford, and Timothy C. Repp, New Hartford, all of Conn., assignors to Audiovox Corporation, Hauppauge, N.Y.

Division of Ser. No. 10,121, Jun. 29, 1993, Pat. No. Des. 356,746. This application Dec. 22, 1994, Ser. No. 32,617

Term of patent 14 years

U.S. Cl. D10—104



363,674

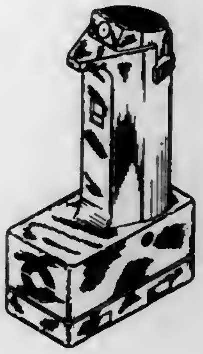
COMBINED HANDHELD AUDIBLE ALARM AND SPRAYER

William J. Bonsall, 22515 Kingsley La., Land of Lakes, Fla. 34639

Filed Jan. 6, 1995, Ser. No. 33,192

Term of patent 14 years

U.S. Cl. D10—106



363,675

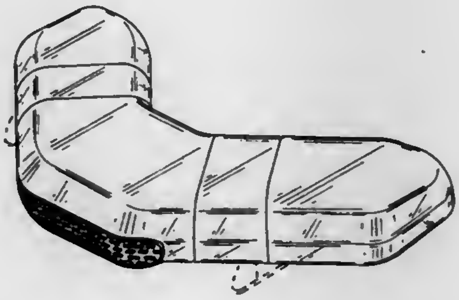
COMBINED WARNING LIGHT AND SIREN HOUSING FOR EMERGENCY VEHICLES

Hiroki Sasaki, Ikoma, and Tetsuya Miyatake, Matubara, both of, Japan, assignors to Patlite Corporation, Osaka, Japan

Filed Jan. 25, 1995, Ser. No. 34,020

Term of patent 14 years

U.S. Cl. D10—114



363,676

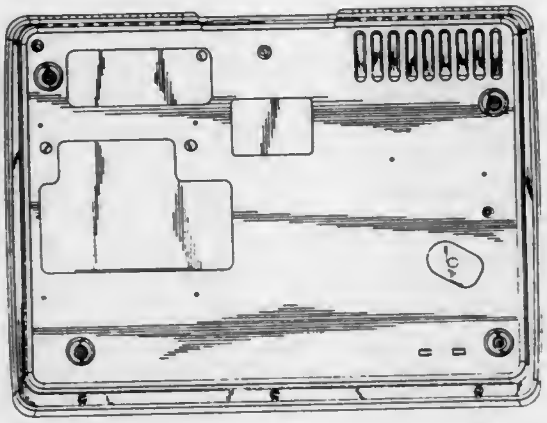
LABORATORY NEPHELOMETER

Mark E. Anderson; Richard J. Cooper; Ernie R. Paoli, and Robert D. Stream, all of Loveland, Colo., assignors to Hach Company, Loveland, Colo.

Filed Oct. 29, 1993, Ser. No. 14,821

Term of patent 14 years

U.S. Cl. D10—75



363,677

MOTORCYCLE WATCH

Rajnish Agarwal, 6D Estoril Court II, 55 Garden Road, Hong Kong, Hong Kong

Filed Feb. 22, 1995, Ser. No. 35,207

Term of patent 14 years

U.S. Cl. D10—33

363,678

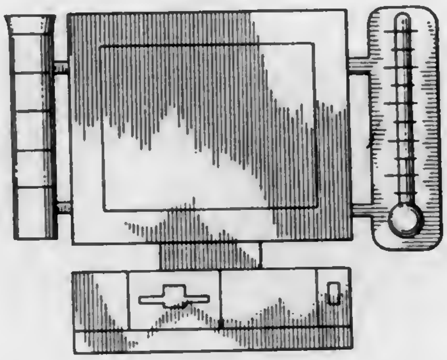
NOVELTY METEOROLOGICAL APPARATUS

Jefferey Thompson, 2687 Stonecreek Dr., #153, Sacramento, Calif. 95833

Filed Sep. 22, 1994, Ser. No. 28,800

Term of patent 14 years

U.S. Cl. D10—53



363,679

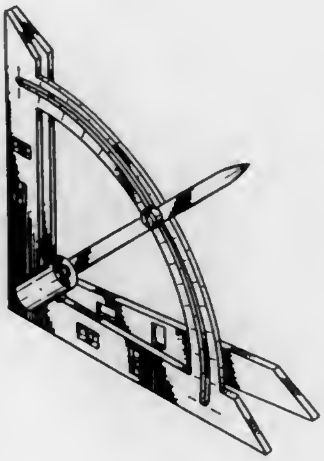
COMBINATION SQUARE USING A LASER

Gary W. Spencer, 1809 S. Pasfield, Springfield, Ill. 62704

Filed Nov. 14, 1994, Ser. No. 31,214

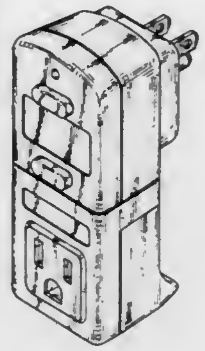
Term of patent 14 years

U.S. Cl. D10—62



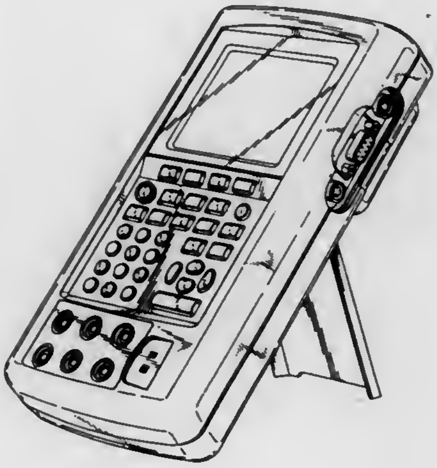
363,680
LEAKAGE PROTECTOR

Wu W. Shan, P.O. Box 82–144, Taipei, Taiwan, Prov. of China
Filed Jan. 20, 1995, Ser. No. 33,802
Term of patent 14 years
U.S. Cl. D10—75



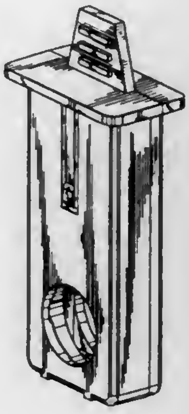
363,681
DOCUMENTING PROCESS CALIBRATOR

Carl J. Ledbetter, Lynnwood, Wash., assignor to Fluke Corporation, Everett, Wash.
Filed Mar. 1, 1994, Ser. No. 19,372
Term of patent 14 years
U.S. Cl. D10—78



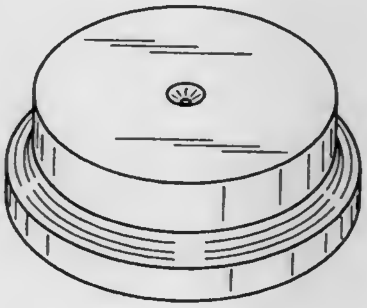
363,682
FILTER HOLDER FOR LABORATORY TURBIDIMETER

Robert D. Stream, Loveland, Colo., assignor to Hach Company, Loveland, Colo.
Filed Dec. 20, 1993, Ser. No. 16,582
Term of patent 14 years
U.S. Cl. D10—80



363,683
PIN BACK FOR EARRING

Dianna L. Spurgeon; D. Scott Spurgeion, both of 330 W. 1st., Mountain Grove, Mo. 65711; Shirley D. Hart, and William T. Hart, both of The Cambridge, Courtyard Center, Springfield, Mo. 65804
Filed May 31, 1994, Ser. No. 23,584
Term of patent 14 years
U.S. Cl. D11—88



363,684

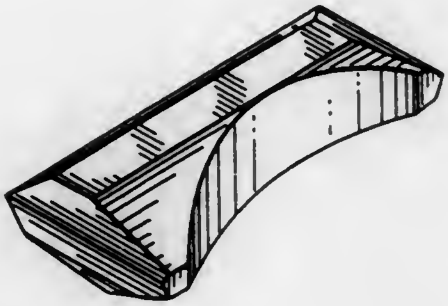
JEWELRY STONE

Stanley Sikorski, Brawford, Conn., and Robert Hurwitz, Ridgewood, N.J., assignors to Sandberg & Sikorski Diamond Corp., New York, N.Y.

Filed May 23, 1994, Ser. No. 23,287

Term of patent 14 years

U.S. Cl. D11—90



363,685

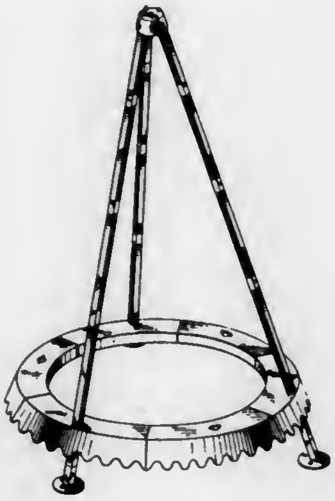
DECORATIVE CHRISTMAS TREE LIGHTING APPARATUS

Donna R. Miller, and Kenneth B. Miller, both of 7011 E. Avenida de Santiago, Anaheim Hills, Calif. 92807

Filed Jun. 24, 1994, Ser. No. 25,113

Term of patent 14 years

U.S. Cl. D11—118



363,686

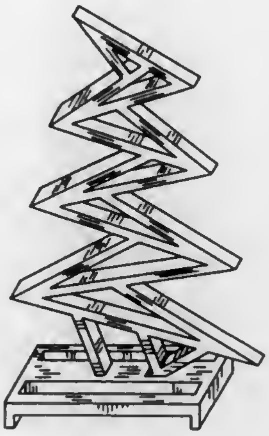
ARTIFICIAL CHRISTMAS TREE

Joseph J. Vodhaneldr, 10937 S. Groveland Ave., Whittier, Calif. 90603

Filed Oct. 17, 1994, Ser. No. 29,757

Term of patent 14 years

U.S. Cl. D11—118



363,687

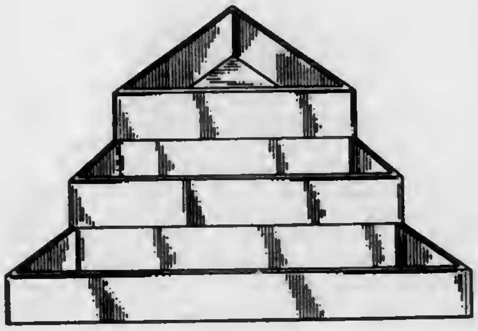
THREE-LAYER PLANTER BOX

John P. Turrentine, P.O. Box 504, 114 Main St., Nantucket, Mass. 02554

Filed Dec. 15, 1994, Ser. No. 32,298

Term of patent 14 years

U.S. Cl. D11—143



363,688

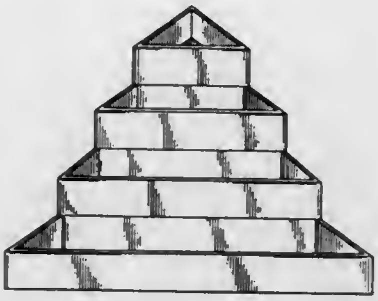
FOUR-LAYER PLANTER BOX

John P. Turrentine, P.O. Box 504, 114 Main St., Nantucket, Mass. 02554

Filed Dec. 15, 1994, Ser. No. 32,299

Term of patent 14 years

U.S. Cl. D11—143



363,689

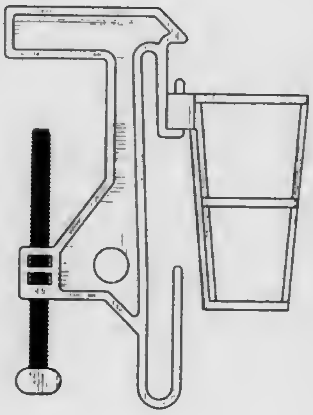
BOUQUET DISPLAY

Lillian R. Vitalune, 3127 Bradbury Dr., Aliquippa, Pa. 15001, and Jill M. Jones, 361 Beaver St., Leetsdale, Pa. 15056

Filed Jul. 22, 1994, Ser. No. 26,219

Term of patent 14 years

U.S. Cl. D11—148



363,690

BUCKLE FASTENER FOR SKI BOOTS

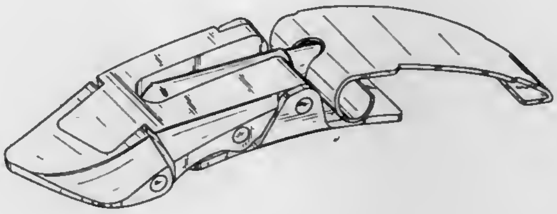
Denis Gallon, Belluno, and Cristiano Benetti, Paese, both of, Italy, assignors to Lange International S.A., Fribourg, Switzerland

Filed Jun. 2, 1994, Ser. No. 23,914

Claims priority, application Hague Agreement, Dec. 10, 1993, DMA/002380

Term of patent 14 years

U.S. Cl. D11—216



363,691

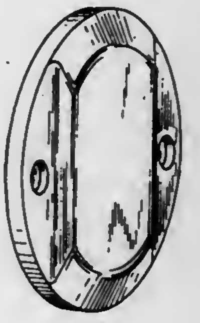
MOTORCYCLE TIMER COVER

William G. Davidson, Delafield, and Louis Netz, Grafton, both of Wis., assignors to Harley-Davidson, Inc., Milwaukee, Wis.

Division of Ser. No. 16,165, Dec. 9, 1993, Pat. No. Des. 354,462. This application Jan. 13, 1995, Ser. No. 33,513

Term of patent 14 years

U.S. Cl. D12—126



363,692

CHILD SEAT BUGGY

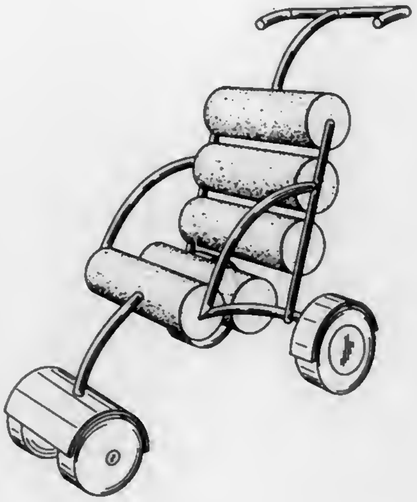
Ludwid A. Landvreugd, Dijkwater 125, 1025 CW Amsterdam, Netherlands

Filed Mar. 14, 1994, Ser. No. 19,899

Claims priority, application Hague Agreement, Sep. 13, 1993, DM/027266

Term of patent 14 years

U.S. Cl. D12—129



363,693

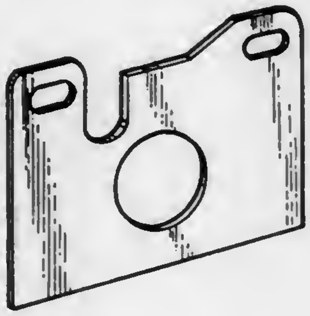
DISC BRAKE SHIM

Gustav J. Steinke, and Starla D. Huffer, both of Lima, Ohio, assignors to International Brake Industries, Inc., Lima, Ohio

Division of Ser. No. 8,255, May 12, 1993, Pat. No. Des. 350,520. This application Feb. 9, 1994, Ser. No. 18,554

Term of patent 14 years

U.S. Cl. D12—180



363,694

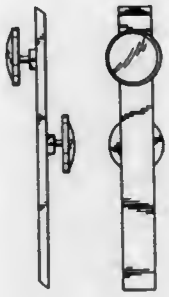
DOUBLE CONVEX MIRROR TO ASSIST IN COUPLING A TRAILER TO A TOW VEHICLE AND LOADING BOAT ON TRAILER

William Birgel, 43 Red Bud La., Hamilton, Ohio 45013-4921

Filed Jun. 16, 1994, Ser. No. 24,583

Term of patent 14 years

U.S. Cl. D12—189



363,695

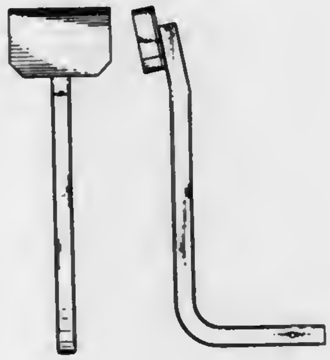
OUTBOARD BOAT MOTOR CARRIER

Norbert F. Sargent, 1200 Jefferson St., Lapeer, Mich. 48446

Filed Jun. 14, 1994, Ser. No. 24,407

Term of patent 14 years

U.S. Cl. D12—317



363,696

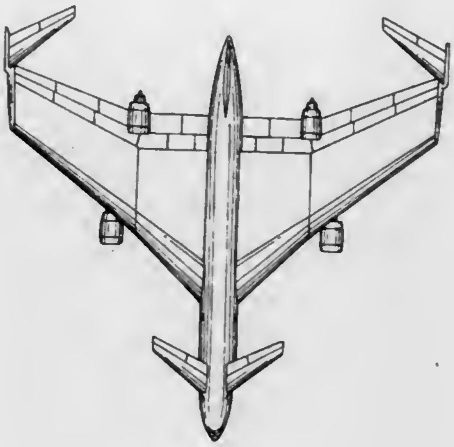
LARGE AIRPLANE WITH NONPLANAR WING

Ilan M. Kroo, Stanford, Calif.; John H. McMasters, Vashon, and Richard J. Pavek, North Bend, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Jun. 23, 1993, Ser. No. 10,191

Term of patent 14 years

U.S. Cl. D12—331



363,697

PERIPHERAL MOLDING FOR AUTOMOBILE WINDSHIELD

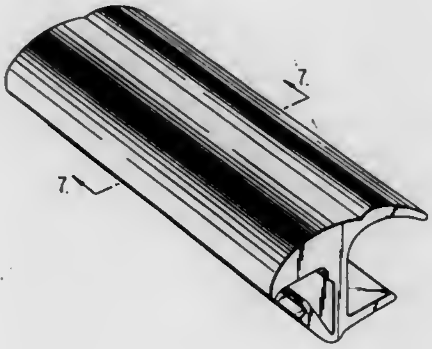
Masaharu Shibao, Matsudo; Kazuya Takahasi, Oomiya, and Akihiko Hirose, Zama, all of, Japan, assignors to Nifco, Inc., Yokohama, Japan

Filed Sep. 27, 1993, Ser. No. 13,516

Claims priority, application Japan, Jun. 21, 1993, 5-18216

Term of patent 14 years

U.S. Cl. D12—400



363,698

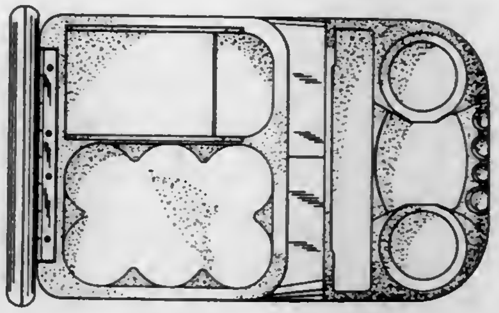
SEAT CADDY

Daniel G. Smith, Grand Prairie, Tex., assignor to Texas Saddlebags Inc., Arlington, Tex.

Filed Jul. 7, 1994, Ser. No. 25,647

Term of patent 14 years

U.S. Cl. D12—419



363,699

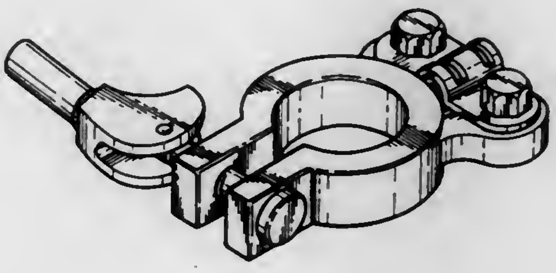
BATTERY TERMINAL CLAMP

Stephen L. Mountfort, P.O. Box 1631, McCall, Id. 83638

Filed Sep. 26, 1994, Ser. No. 28,589

Term of patent 14 years

U.S. Cl. D13—120



363,700

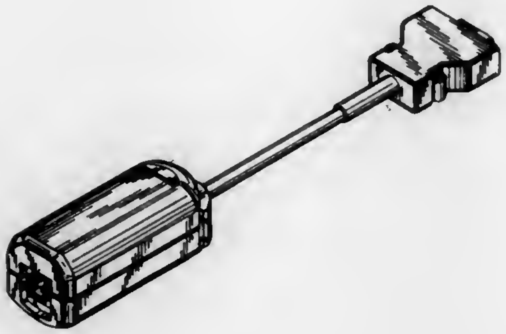
CABLE ASSEMBLY

Nicholas Buongervino, Hauppauge; Ronald Edwards, Sayville; Peter Musteric, Hauppauge, and Patrick Mauro, Lake Grove, all of N.Y., assignors to Symbol Technologies, Inc., Bohemia, N.Y.

Filed Mar. 23, 1995, Ser. No. 36,647

Term of patent 14 years

U.S. Cl. D13—147



363,701

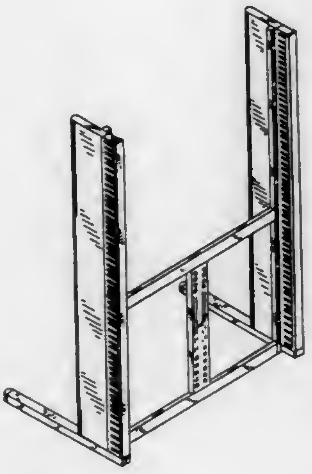
SHELF SUPPORT AND ELECTRICAL CABLE MANAGEMENT STRUCTURE

Edmund T. Paquette, Shrewsbury, and Donald B. McCallum, Douglas, both of Mass., assignors to Wright Line, Inc., Worcester, Mass.

Continuation of Ser. No. 17,310, Jan. 10, 1994. This application May 8, 1995, Ser. No. 38,586

Term of patent 14 years

U.S. Cl. D13—154



363,702

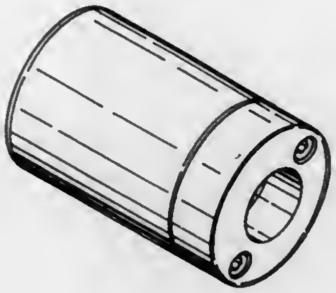
SOLENOID HOUSING AND CAP

Patrick A. McFadden, 255 Woodside Dr., Pataskala, Ohio 43062

Filed Feb. 16, 1994, Ser. No. 18,865

Term of patent 14 years

U.S. Cl. D13—183



363,703

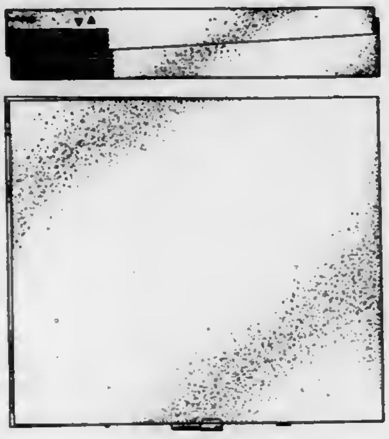
TOP, SIDES AND FRONT PORTIONS OF A COMPUTER HOUSING

Brian J. Ray, San Jose; David J. Willheim, Los Gatos, and Michael J. Nuttall, Portola Valley, all of Calif., assignors to Silicon Graphics, Inc., Mountain View, Calif.

Filed Nov. 18, 1993, Ser. No. 15,504

Term of patent 14 years

U.S. Cl. D14—100



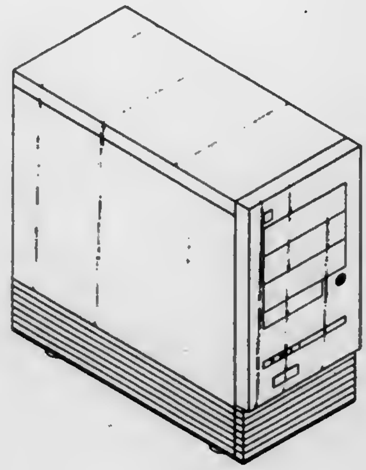
363,704
TOWER COMPUTER

Philip W. Chang, Agoura Hills, Calif., assignor to Packard Bell Electronics, Inc., Westlake Village, Calif.

Filed Aug. 22, 1994, Ser. No. 27,463

Term of patent 14 years

U.S. Cl. D14—100



363,705
COMPUTER

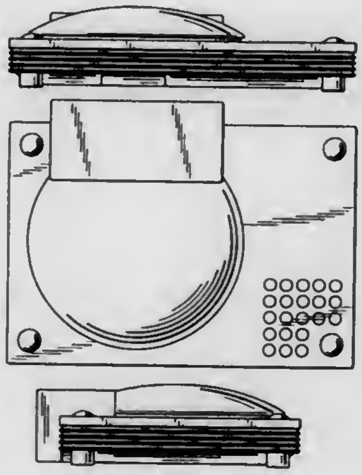
Kazuhiko Yamazaki, Hiratuka, Japan, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 9, 1994, Ser. No. 30,842

Claims priority, application Japan, May 20, 1994, 6-14518

Term of patent 14 years

U.S. Cl. D14—100



363,706
COMPUTER

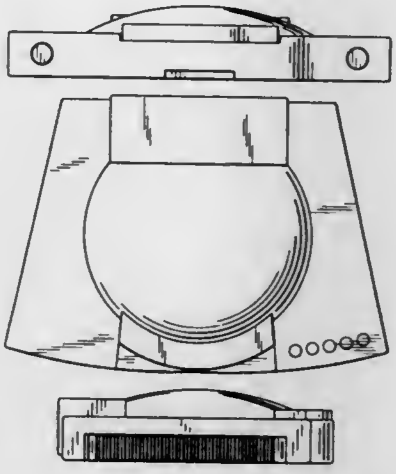
Kazuhiko Yamazaki, Hiratuka, Japan, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 9, 1994, Ser. No. 30,843

Claims priority, application Japan, May 20, 1994, 6-14517

Term of patent 14 years

U.S. Cl. D14—100



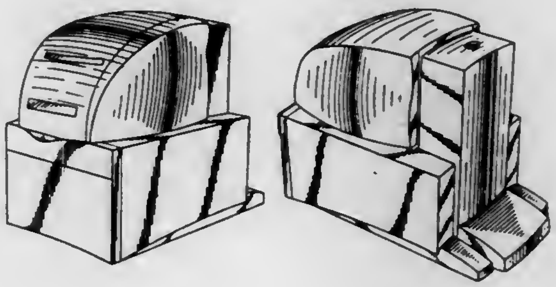
363,707
COMPUTER CABINET

Stanford W. Crane, Jr.; Maria M. Portuondo, both of Boca Raton, Fla.; Edward V. Cruz, Newbury Park, Calif.; Shaun Fynn, West Hollywood, Calif., and Barry Sween, Santa Monica, Calif., assignors to The Panda Project, Boca Raton, Fla.

Filed Mar. 11, 1994, Ser. No. 19,781

Term of patent 14 years

U.S. Cl. D14—102



363,708

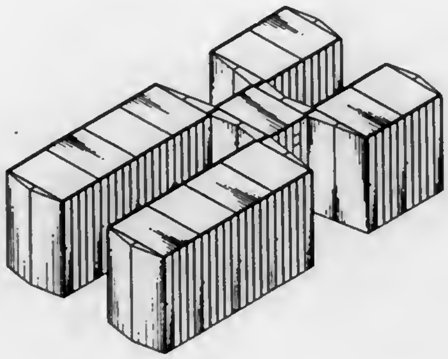
COMPUTER SYSTEM

Edward Furey, Marbletown; Marian H. Gravel, Highland, both of N.Y.; Susan S. Moffatt, Boca Raton, Fla.; Gerard F. Muenkel, Highland, and Thomas A. Parkin, Tillson, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 10, 1994, Ser. No. 22,655

Term of patent 14 years

U.S. Cl. D14—102



363,709

DISPLAY FACE OF A LIQUID CRYSTAL DISPLAY MODULE

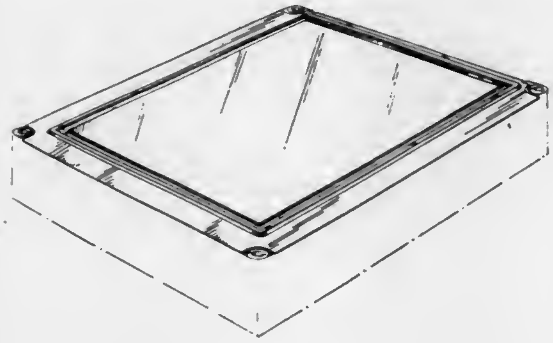
Takumi Matsumoto, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Dec. 2, 1994, Ser. No. 32,119

Claims priority, application Japan, Aug. 4, 1994, 6-23710

Term of patent 14 years

U.S. Cl. D14—113



363,710

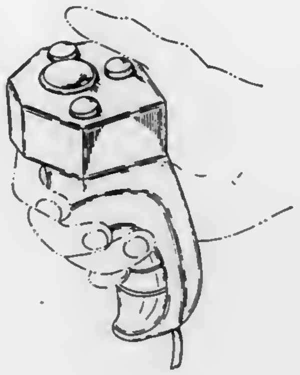
COMBINED HAND-HELD DISPLAY CONTROLLER AND TRACKBALL FOR A COMPUTER

Annette Mateus, and Carlos A. Mateus, both of 3521 Sheffield Manor Ter., Apt. 303, Silver Spring, Md. 20904

Filed May 6, 1994, Ser. No. 22,518

Term of patent 14 years

U.S. Cl. D14—114



363,711

OPTICAL DISK CARTRIDGE

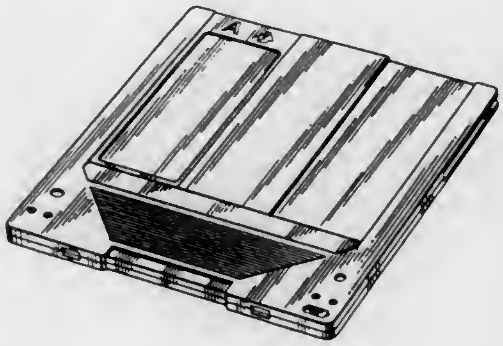
Masahiko Happo, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 27, 1994, Ser. No. 23,644

Claims priority, application Japan, Nov. 30, 1993, 5-36147

Term of patent 14 years

U.S. Cl. D14—114



363,712

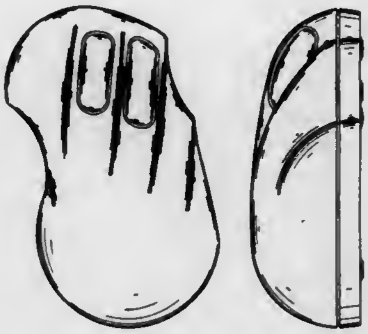
MOUSE

Tetsuya Yamada, Okayama, Japan, assignor to Sanwa Supply Co., Ltd., Okayama, Japan

Filed Aug. 31, 1994, Ser. No. 27,877

Term of patent 14 years

U.S. Cl. D14—114



363,713

FACSIMILE MACHINE

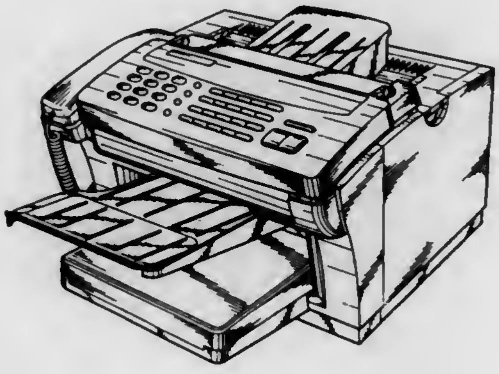
Masumi Kanari, and Takeshi Kodera, both of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Nov. 21, 1994, Ser. No. 31,256

Claims priority, application Japan, May 19, 1994, 6-14574

Term of patent 14 years

U.S. Cl. D14—118



363,714

COMBINED TELEVISION RECEIVER, COMPACT DISC PLAYER, TAPE RECORDER, VIDEO TAPE RECORDER AND FM RADIO

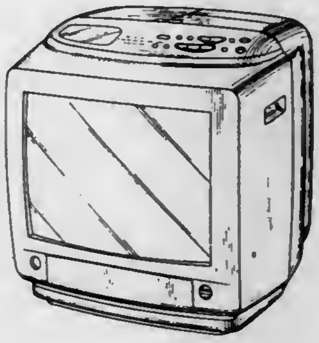
Akira Onoda; Norihiko Shimose, both of Ehime; Mitsunari Fujii, and Yusuke Morita, both of Osaka, all of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Aug. 11, 1994, Ser. No. 27,038

Claims priority, application Japan, Feb. 14, 1994, 6-3464

Term of patent 14 years

U.S. Cl. D14—129



363,715

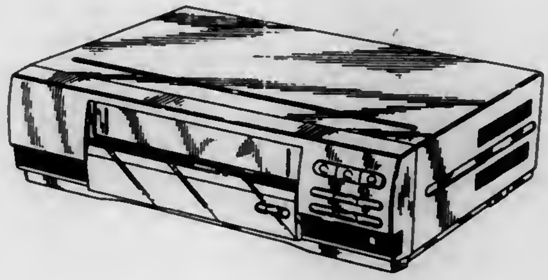
VIDEO TAPE RECORDER

Takuji Kaneko, Nara, Japan, assignor to Funai Electric Co., Ltd., Nara, Japan

Filed Sep. 29, 1994, Ser. No. 29,076

Term of patent 14 years

U.S. Cl. D14—135



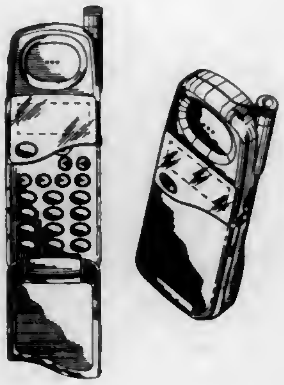
363,716
PORTABLE COMMUNICATION DEVICE

Craig F. Siddoway, Davie; Scott H. Richards, Plantation, both of Fla., and William A. Gilbert, Ft. Worth, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 2, 1994, Ser. No. 31,657

Term of patent 14 years

U.S. Cl. D14—138



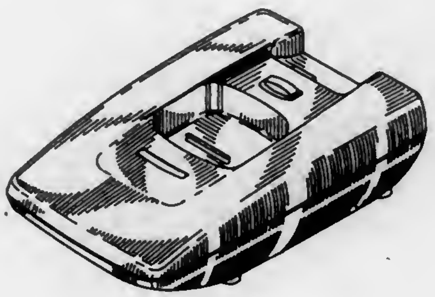
363,717
TELEPHONE BASE

Anthony Solomita, Norwalk, Conn., assignor to Conair Corporation, Stamford, Conn.

Filed Sep. 30, 1994, Ser. No. 29,193

Term of patent 14 years

U.S. Cl. D14—149



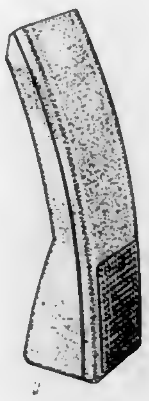
363,718
HAND HELD, SELF CONTAINED, PERSONAL VOICE AMPLIFIER

Edwin E. Hedeen, 14350 Wooded Path La., Orland Park, Ill. 60462

Filed Jul. 20, 1994, Ser. No. 26,151

Term of patent 14 years

U.S. Cl. D14—187



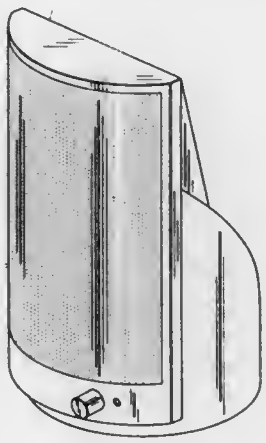
363,719
SPEAKER ENCLOSURE

Christopher N. Cindrich, Provo, Utah, and Tristan A. Merino, Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 4, 1994, Ser. No. 26,756

Term of patent 14 years

U.S. Cl. D14—216



363,720
REMOTE CONTROL UNIT

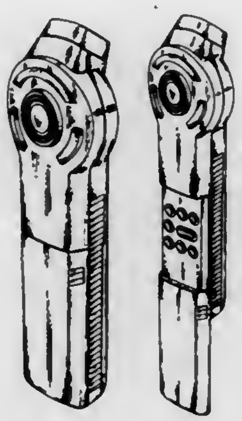
Alfonsus B. A. Lagohm, Maarheeze, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 7, 1994, Ser. No. 19,631

Claims priority, application WIPO, Sep. 27, 1993, DM/027408

Term of patent 14 years

U.S. Cl. D14—218



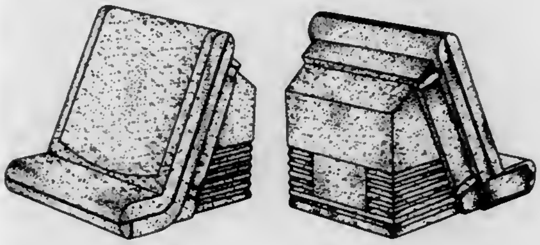
363,721
COMBINED SPEAKER AND MICROPHONE PERIPHERAL UNIT

Michael W. Lum, Tustin, Calif.; Jeffrey P. McAteer, Fishers, Ind., and Robert B. Wills, Redondo Beach, Calif., assignors to AT&T IPM Corp., Coral Gables, Fla.

Filed Sep. 19, 1994, Ser. No. 28,536

Term of patent 14 years

U.S. Cl. D14—226



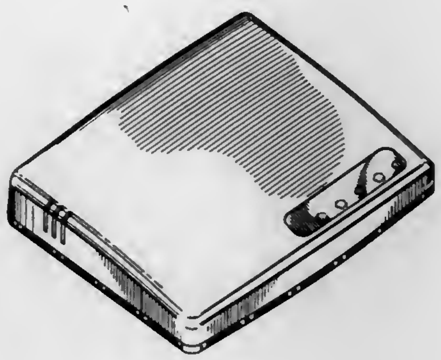
363,722
DATA COMMUNICATIONS DEVICE HOUSING

Timothy W. Aldridge, Somerville, and Gerald H. Click, Huntsville, both of Ala., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 5, 1994, Ser. No. 28,622

Term of patent 14 years

U.S. Cl. D14—242



363,723
HANDSFREE UNIT FOR A PORTABLE TELEPHONE

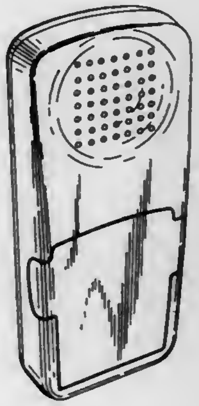
Robert Hellier, and Tomek Rudkiewicz, both of Turku, Finland, assignors to Nokia Mobile Phones Ltd., Salo, Finland

Filed Jul. 25, 1994, Ser. No. 26,390

Claims priority, application United Kingdom, Feb. 23, 1994, 2037287

Term of patent 14 years

U.S. Cl. D14—243



363,724

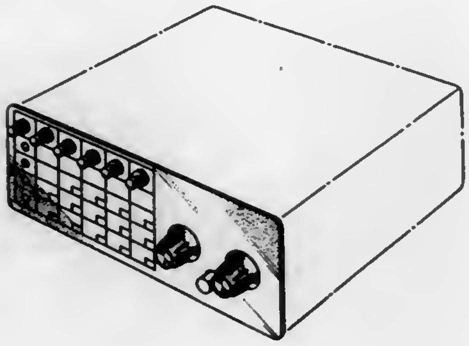
FRONT PANEL FOR AN AMATEUR RADIO CODE KEYER

Martin F. Jue, Starkville, and Stephen D. Jue, Mississippi State, both of Miss., assignors to MFJ Enterprises, Inc., Starkville, Miss.

Filed Mar. 11, 1993, Ser. No. 5,763

Term of patent 14 years

U.S. Cl. D14—257



363,725

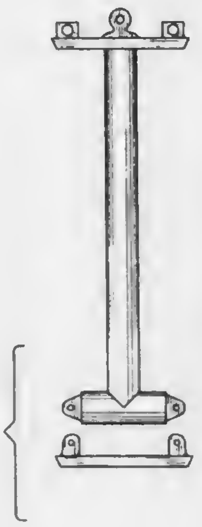
PIPE COMPACTOR TOOL

Clinton B. Campbell, 2702 50th Ave. NE., Tacoma, Wash. 98422

Filed Feb. 28, 1994, Ser. No. 19,272

Term of patent 14 years

U.S. Cl. D15—123



363,726

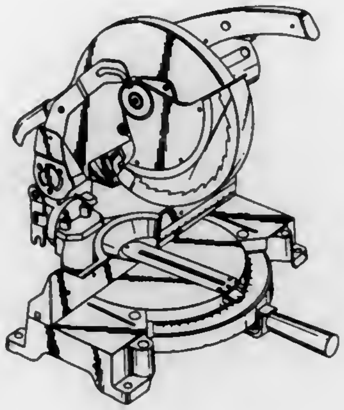
ELECTRIC SAW

Chiu-Tsun Chang, Taichung, Taiwan, Prov. of China, assignor to P&F Brother Industrial Corporation, Taichung, Taiwan, Prov. of China

Filed Aug. 5, 1994, Ser. No. 26,775

Term of patent 14 years

U.S. Cl. D15—133



363,727

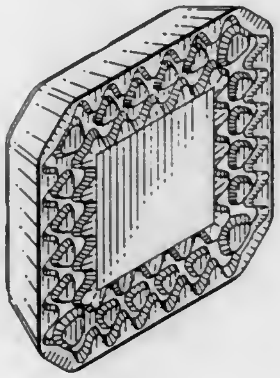
CUTTING TOOL INSERT

Kenneth G. DeRoche, Cary, N.C., assignor to Kennametal Inc., Latrobe, Pa.

Filed Aug. 10, 1993, Ser. No. 11,599

Term of patent 14 years

U.S. Cl. D15—139



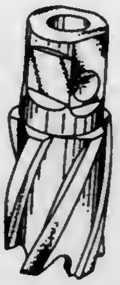
363,728
HOLE CUTTER

Osamu Asano, Tokyo, Japan, assignor to Nitto Kohki Co., Ltd., Tokyo, Japan

Filed Dec. 22, 1994, Ser. No. 32,615

Term of patent 14 years

U.S. Cl. D15—139



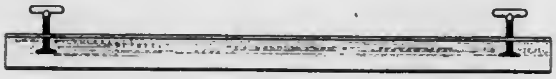
363,729
LUMBER STRAIGHTENER

Jack T. Freeland, 2022 Gypsum Creek Rd., Gypsum, Colo. 81637

Filed Nov. 7, 1994, Ser. No. 31,095

Term of patent 14 years

U.S. Cl. D15—140



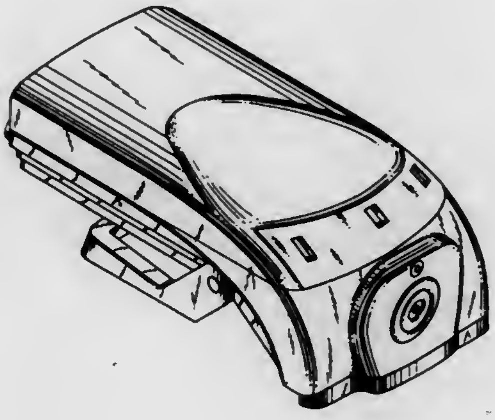
363,730
VIDEO CAMERA UNIT FOR MOUNTING ON A COMPUTER MONITOR

Daniel P. Flohr, Wilmington, and Charles Floyd, Raleigh, both of N.C., assignors to Target Technologies, Inc., Wilmington, N.C.

Filed Jul. 18, 1994, Ser. No. 25,934

Term of patent 14 years

U.S. Cl. D16—202



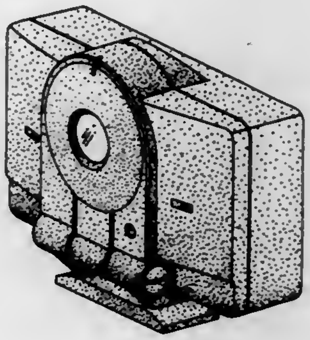
363,731
VIDEO CAMERA UNIT MOUNTED ON A PERSONAL COMPUTER MONITOR

Tor A. Alden, Bernardsville; Marc J. Beacken, Randolph Township, Morris County; Robert L. Doran, Mt. Olive Township, Morris County; John E. Nordman, Randolph, and James G. Turner, Wharton, all of N.J., assignors to AT&T IPM Corp., Coral Gables, Fla.

Filed Jul. 21, 1994, Ser. No. 26,157

Term of patent 14 years

U.S. Cl. D16—202



363,732
ELECTRONIC CALCULATOR

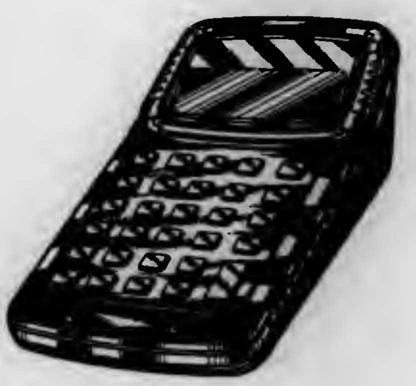
Toru Suzuki, Sagamihara, and Hiroshi Nakatsuka, Tokyo, both of, Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Filed Mar. 11, 1994, Ser. No. 19,878

Claims priority, application Japan, Nov. 30, 1993, 5-36008

Term of patent 14 years

U.S. Cl. D18—7



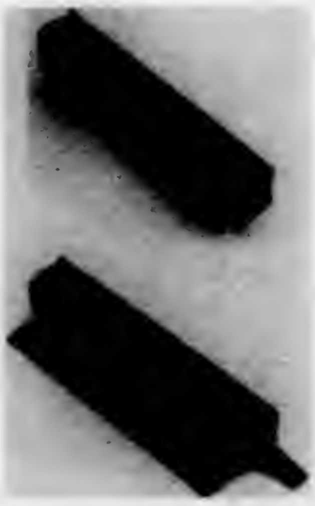
363,733
PRINTER FOR ELECTRONIC COMPUTER

Isao Sugimoto, Tokyo, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Jul. 13, 1994, Ser. No. 25,838

Term of patent 14 years

U.S. Cl. D18—50



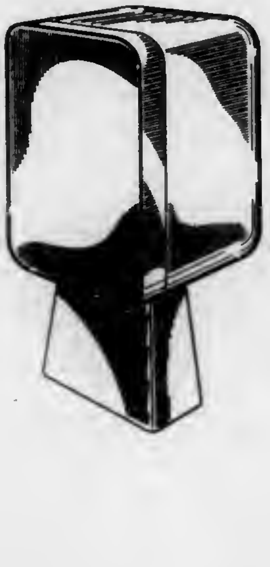
363,734
RECEIPT PRINTER

James S. Bianco; James W. Bianco, and Brian W. Phelps, all of Enfield, Conn., assignors to Control Module Inc., Enfield, Conn.

Filed Aug. 8, 1994, Ser. No. 26,847

Term of patent 14 years

U.S. Cl. D18—50



363,735
PRINTING MACHINE

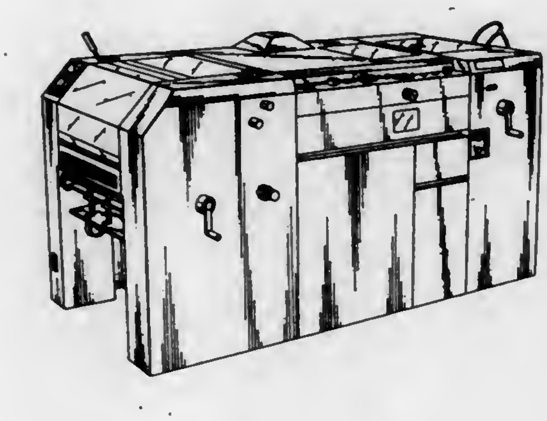
Nobuhiko Karafuji, Tokyo, and Takahiko Shinmoto, Hiroshima, both of, Japan, assignors to Ryobi, Ltd., Hiroshima, Japan

Filed Feb. 28, 1994, Ser. No. 19,280

Claims priority, application Japan, Sep. 6, 1993, 5-27108

Term of patent 14 years

U.S. Cl. D18—53



363,736
INK CARTRIDGE FOR PRINTER

Toshihiko Ujita, Yamato; Keiichiro Tsukuda; Kayomi Sato, both of Kawasaki, and Masanori Takenouchi, Yokohama, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

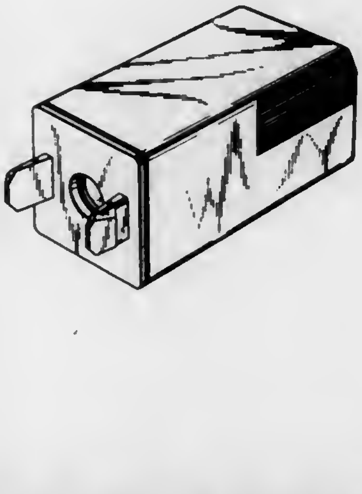
Filed Jan. 18, 1994, Ser. No. 17,549

Claims priority, application Japan, Jul. 20, 1993, 5-22150

The portion of the term of this patent subsequent to Jul. 5, 2008, has been disclaimed.

Term of patent 14 years

U.S. Cl. D18—56



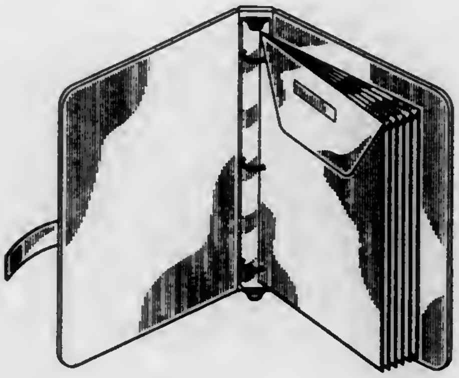
363,737
COMBINED SANDPAPER AND EMERY PAPER PORTFOLIO

Shelby D. Snow, 35 Sunny Hills Dr., #18, San Anselmo, Calif. 94960

Filed Mar. 29, 1993, Ser. No. 6,521

Term of patent 14 years

U.S. Cl. D19—27



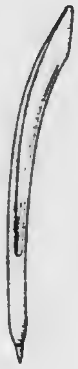
363,738
PEN

Chiu-Lap Wong, Kowloon, Hong Kong, assignor to Justide Industrial Limited, Taiwan, Prov. of China

Filed Jan. 25, 1995, Ser. No. 34,143

Term of patent 14 years

U.S. Cl. D19—45



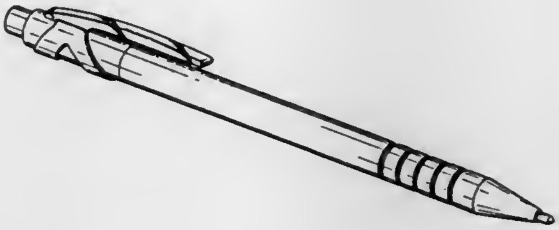
363,739
PEN

Richard J. Petrillo, Norwell, Mass., assignor to The Gillette Company, Boston, Mass.

Filed Sep. 30, 1994, Ser. No. 29,021

Term of patent 14 years

U.S. Cl. D19—48



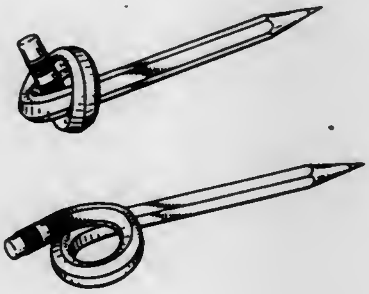
363,740
NOVELTY PENCIL

Steven R. Quimby, 5645 Everson Goshen Rd., Bellingham, Wash. 98226

Filed Feb. 22, 1995, Ser. No. 35,200

Term of patent 14 years

U.S. Cl. D19—46



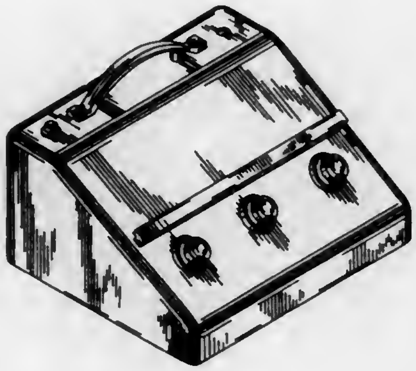
363,741
CABINET FOR INSTRUCTIONAL ELECTRONIC COMMUNICATION

Ruth B. Leff, and Aaron N. Leff, both of 6589 N. Crestwood Dr., Glendale, Wis. 53209

Filed Sep. 15, 1993, Ser. No. 13,006

Term of patent 14 years

U.S. Cl. D19—60



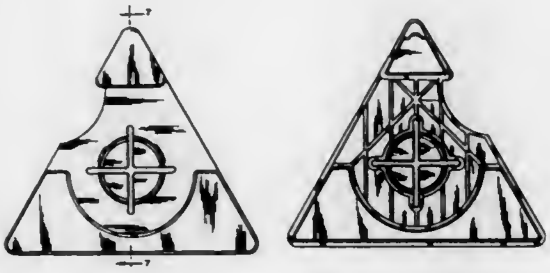
363,742
TAPE DISPENSER

W. Tyler Fitzsimmons, South Portland, Me., assignor to Micro-plas, Inc., Clinton, Mass.

Filed Jun. 24, 1994, Ser. No. 24,969

Term of patent 14 years

U.S. Cl. D19—69



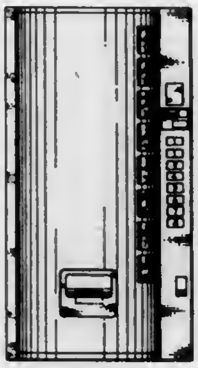
363,743
CAN VENDING MACHINE

William J. Stringfellow, Roselle, Ill., assignor to R-O International Corporation, Roselle, Ill.

Filed Sep. 26, 1994, Ser. No. 28,908

Term of patent 14 years

U.S. Cl. D20—5



363,744
VIDEO GAME MACHINE

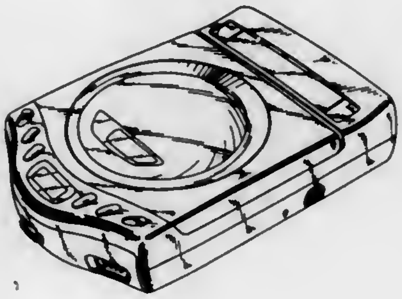
Hirokazu Hama, Tokyo, Japan, assignor to Sega Enterprises, Tokyo, and Sanyo Electric Co., Ltd., Osaka, both of, Japan

Filed Jul. 1, 1994, Ser. No. 25,685

Claims priority, application Japan, Jan. 5, 1994, 6-53

Term of patent 14 years

U.S. Cl. D21—13



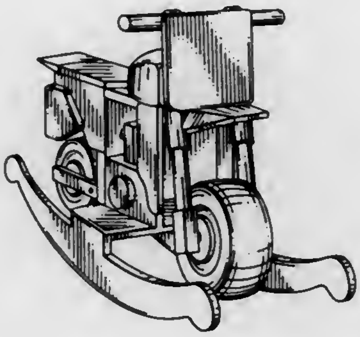
363,745
ROCKING MOTORCYCLE TOY

Mark M. McNett, 301 Helzer, Great Bend, Kans. 67530

Filed Feb. 2, 1995, Ser. No. 32,218

Term of patent 14 years

U.S. Cl. D21—68



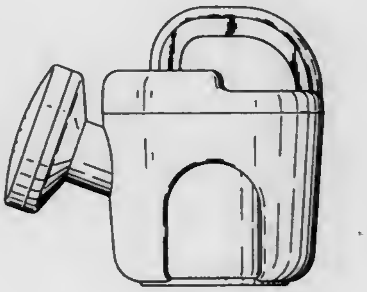
363,746
TOY WATERING POT

Moriya Kino, Yokohama, Japan, assignor to Royal Co., Ltd., Japan

Filed Dec. 29, 1993, Ser. No. 16,918

Term of patent 14 years

U.S. Cl. D21—120



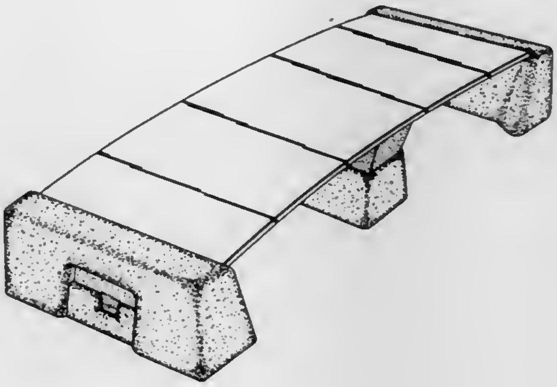
363,747
EXERCISE BENCH

Ned Gvoich, Beamsville, Canada, assignor to Kor-One, Ltd., Tempe, Ariz.

Filed Nov. 23, 1994, Ser. No. 31,366

Term of patent 14 years

U.S. Cl. D21—191



363,748
GOLF CLUB HEAD

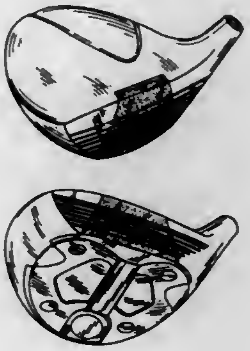
Kanji Iinuma, Musashino, and Yutaka Oku, Kurume, both of, Japan, assignors to Daiwa Golf Co., Ltd., Japan

Filed Jul. 19, 1994, Ser. No. 26,088

Claims priority, application Japan, Jan. 24, 1994, 6-1168

Term of patent 14 years

U.S. Cl. D21—214



363,749
HEAD OF GOLF CLUB

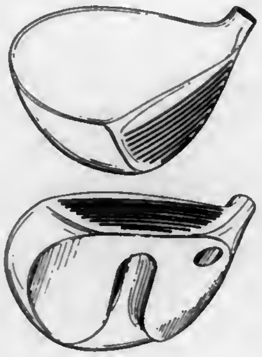
Yoshinari Kenmi, Kobeshi, Japan, assignor to Royal Collection Incorporated, Hyogo, Japan

Filed Oct. 7, 1994, Ser. No. 26,938

Claims priority, application Japan, Sep. 7, 1994, 6-27270

Term of patent 14 years

U.S. Cl. D21—214



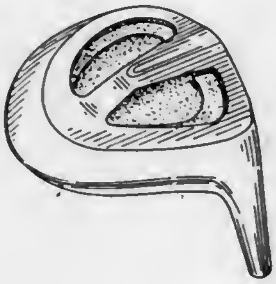
363,750
GOLF CLUB HEAD

Timothy R. Reed, Buffalo Grove, Ill., assignor to Tommy Armour Golf Company, Morton Grove, Ill.

Filed Nov. 4, 1994, Ser. No. 30,679

Term of patent 14 years

U.S. Cl. D21—214



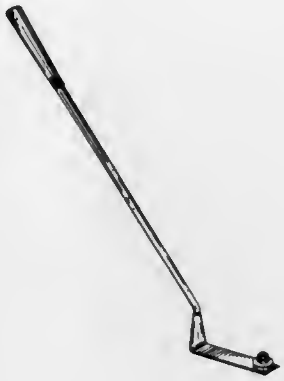
363,751
GOLF TRAINING CLUB

Robert Lysohir, 524 S. Oakland, Sharon, Pa. 16146

Filed Sep. 19, 1994, Ser. No. 28,651

Term of patent 14 years

U.S. Cl. D21—234



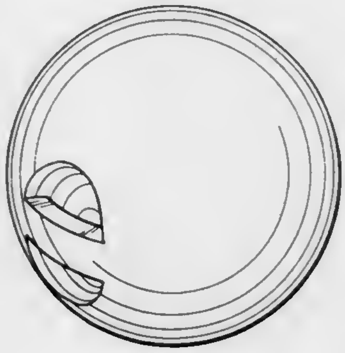
363,752
AQUATIC BODY CONDITIONING BALL

Glenda T. Shumber, 104 Ashley Rd., and Linda T. McConnell, 172 Wilson Mann Rd., both of Crossroads, Ala. 35763

Filed Dec. 9, 1994, Ser. No. 32,151

Term of patent 14 years

U.S. Cl. D21—236



363,753

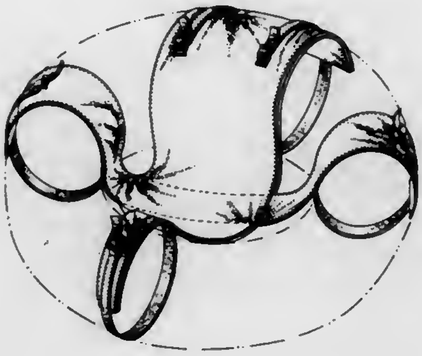
FISHING HARNESS FOR AN INNER TUBE

Daniel G. Estrada, 3933 English Oak Dr., Doraville, Ga. 30340, and Mark A. Estrada, N. 4527 Royal Ct., Spokane, Wash. 99205

Filed Jun. 21, 1993, Ser. No. 9,741

Term of patent 14 years

U.S. Cl. D21—237



363,754

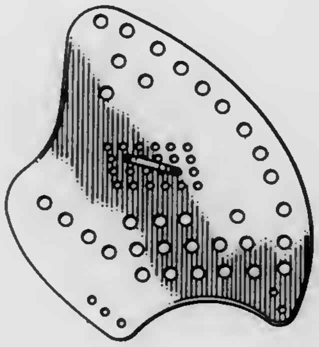
STRAP-ON SWIM HAND PADDLE

Ronald L. Johnson, Scottsdale, Ariz., assignor to Marika W. Johnson, Phoenix, Ariz.

Filed Oct. 14, 1994, Ser. No. 29,732

Term of patent 14 years

U.S. Cl. D21—237



363,755

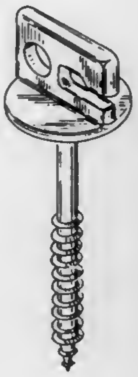
THREADED TENT STAKE

Scott Diederich, 916 W. Peck St., Whitewater, Wis. 53190

Filed Aug. 10, 1994, Ser. No. 26,985

Term of patent 14 years

U.S. Cl. D21—255



363,756

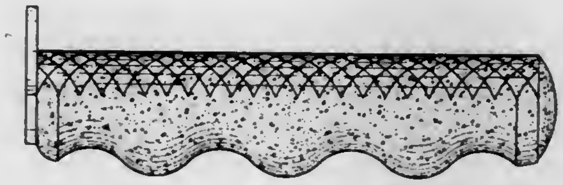
FISHING ROD HANDLE PROTECTOR

Paul M. DiGrazia, 23980 Myrtle St., Hayward, Calif. 94541

Filed Feb. 16, 1994, Ser. No. 18,775

Term of patent 14 years

U.S. Cl. D22—142



363,757
WATER PURIFIER

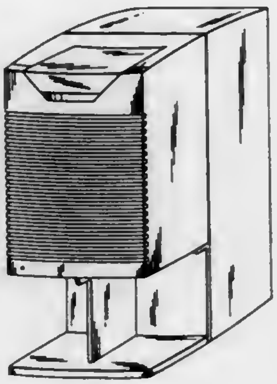
Olof Hagstrand, Stockholm, Sweden, assignor to HVR Invest AB, Stockholm, Sweden

Filed May 4, 1992, Ser. No. 878,873

Claims priority, application Sweden, Nov. 6, 1991, 91-2214

Term of patent 14 years

U.S. Cl. D23—207



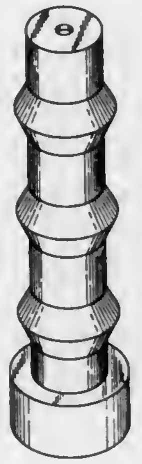
363,758
STILL

Armand R. Boucher, and Philip N. Hambrick, both of Louisville, Ky., assignors to Vendome Copper & Brass Works, Inc., Louisville, Ky.

Filed Jun. 2, 1993, Ser. No. 9,037

Term of patent 14 years

U.S. Cl. D23—207



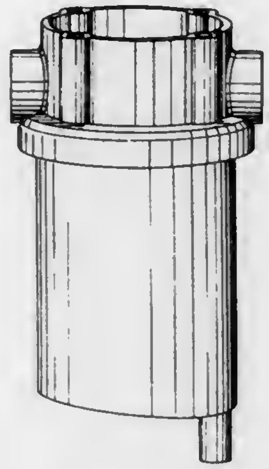
363,759
COMBINED FILTER AND CONNECTOR

Gary Schafer, Portage, and Gary F. Stack, Grand Blanc, both of Mich., assignors to SPX Corporation, Muskegon, Mich.

Filed May 11, 1994, Ser. No. 22,712

Term of patent 14 years

U.S. Cl. D23—209



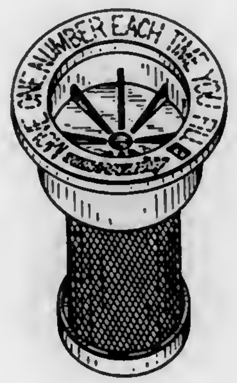
363,760
WATER FILTER

Steven C. Morem, Golden Valley, and Mark R. Mudra, Edina, both of Minn., assignors to ValueDirect Filtration Systems, Inc., Minneapolis, Minn.

Filed Jan. 3, 1995, Ser. No. 32,999

Term of patent 14 years

U.S. Cl. D23—209



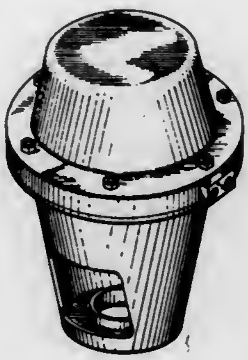
363,761
VALVE ACTUATOR

Philip W. Eggleston, and Randy J. Hall, both of Marshalltown, Iowa, assignors to Fisher Controls International, Inc., Clayton, Mo.

Filed Jun. 2, 1994, Ser. No. 23,894

Term of patent 14 years

U.S. Cl. D23—233



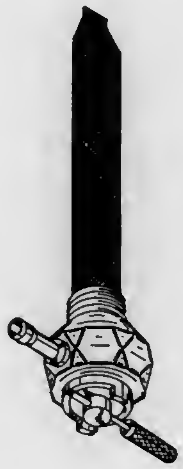
363,762
FUEL VALVE

Wayne Pingel, and Donna Pingel, both of 2076C 11th Ave., Adams, Wis. 53910

Filed Oct. 17, 1994, Ser. No. 29,759

Term of patent 14 years

U.S. Cl. D23—233



363,763
FAUCET

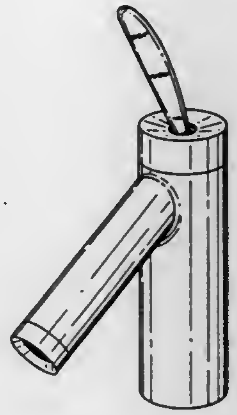
Philippe Starck, Montfort L'Amaury, France, assignor to Han Grohe GmbH & Co. KG, Germany

Filed Aug. 4, 1994, Ser. No. 26,720

Claims priority, application Germany, Feb. 8, 1994, M 94 01 185.0

Term of patent 14 years

U.S. Cl. D23—243



363,764
FAUCET HANDLE

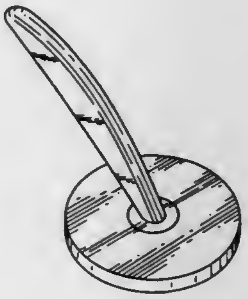
Philippe Starck, Montfort L'Amaury, France, assignor to Hans Grohe GmbH & Co. KG, Germany

Filed Aug. 4, 1994, Ser. No. 26,715

Claims priority, application Germany, Feb. 8, 1994, 94 01 185.0

Term of patent 14 years

U.S. Cl. D23—252



363,765
COMBINED SHOWER HANDLE AND ESCUTCHEON

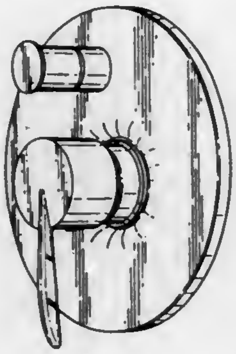
Philippe Starck, Montfort L'Amaury, France, assignor to Hans Grohe GmbH & Co. KG, Germany

Filed Aug. 4, 1994, Ser. No. 26,721

Claims priority, application Germany, Feb. 8, 1994, 94 01 185.0

Term of patent 14 years

U.S. Cl. D23—254



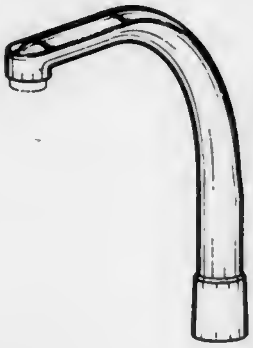
363,766
FAUCET SPOUT

Loran R. Hill, Indianapolis, and Anthony G. Spangler, Sheridan, both of Ind., assignors to Masco Corporation of Indiana, Taylor, Mich.

Filed Nov. 9, 1993, Ser. No. 15,143

Term of patent 14 years

U.S. Cl. D23—255



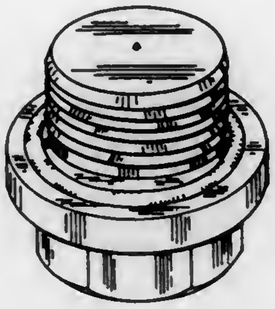
363,767
DRAIN PLUG

N. Grant Swaim, 2530 Willard Rd., High Point, N.C. 27265

Filed Jun. 21, 1994, Ser. No. 24,808

Term of patent 14 years

U.S. Cl. D23—260



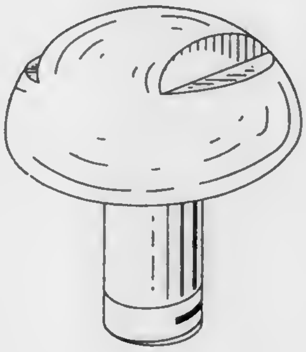
363,768
FLOOR DRAIN PROTECTIVE CAP

George M. Morgan, 15658 Reeder, Overland Park, Kans. 66212

Filed Aug. 9, 1994, Ser. No. 26,903

Term of patent 14 years

U.S. Cl. D23—260



363,769

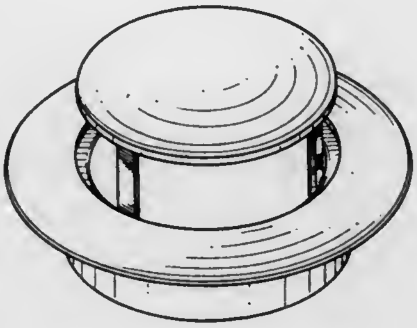
WATER RELIEF VALVE FOR A DRAINAGE SYSTEM

James E. Petrie, and Trevor J. Phillips, both of 3001 Mission Oak Blvd., Camarillo, Calif. 93011

Filed Dec. 17, 1993, Ser. No. 16,534

Term of patent 14 years

U.S. Cl. D23—261



363,770

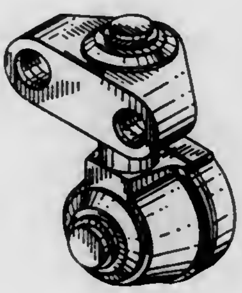
CONNECTOR FOR FLUID-OPERATED TOOLS

John K. Junkers, 7 Arrowhead La., Saddle River, N.J. 07540

Filed Jun. 23, 1994, Ser. No. 24,906

Term of patent 14 years

U.S. Cl. D23—262



363,771

SEAL

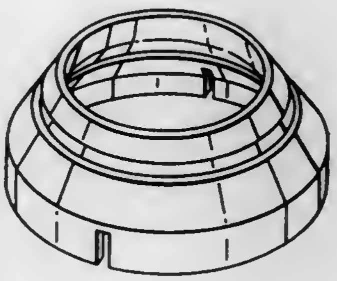
Norman I. Mathers, P.O. Box 553, Zillmere, Queensland, Australia

Filed Aug. 1, 1994, Ser. No. 26,584

Claims priority, application Australia, Feb. 3, 1994, 255/94

Term of patent 14 years

U.S. Cl. D23—269



363,772

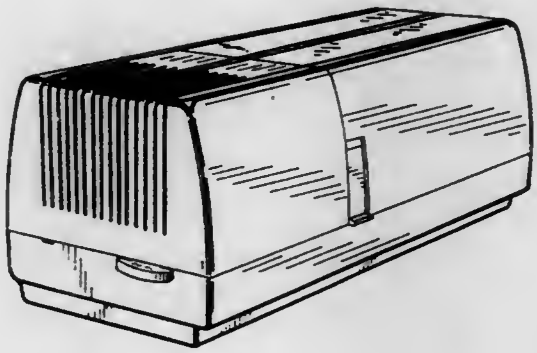
AIR TREATMENT DEVICE ENCLOSURE

Robert Kopp, Algonquin, Ill., and John D. Bryson, Jr., Pewaukee, Wis., assignors to Vaportek, Inc., Sussex, Wis.

Filed Oct. 15, 1993, Ser. No. 15,032

Term of patent 14 years

U.S. Cl. D23—355



363,773
VENTILATOR

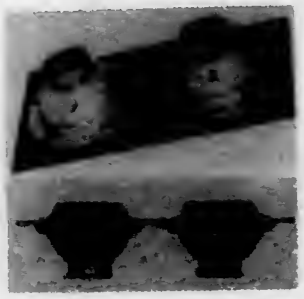
Keisuke Nishizawa, Tokyo, Japan, assignor to Seiho International, Inc., San Marino, Calif.

Filed Jun. 29, 1994, Ser. No. 25,315

Claims priority, application Japan, Feb. 8, 1994, 6-002615

Term of patent 14 years

U.S. Cl. D23—370



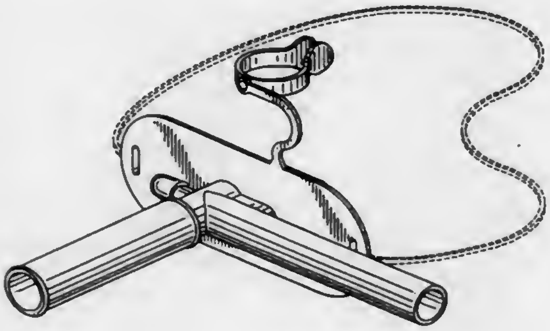
363,774
RESUSCITATOR FOR ADMINISTERING CPR

G. Neil Robertson, II, Clackamas, Oreg., and Truman F. Allen, Sparks, Nev., assignors to Aries International, Inc., Clackamas, Oreg.

Filed May 31, 1994, Ser. No. 23,718

Term of patent 14 years

U.S. Cl. D24—110



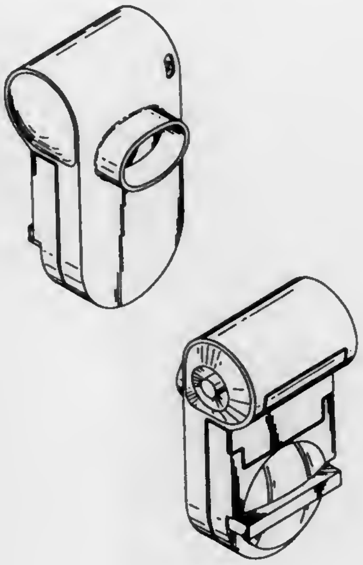
363,775
MULTIDOSE DRY POWDER INHALER

Michael A. Hobbs, Dagenham, United Kingdom, assignor to Rhone-Poulenc Rorer Limited, Eastbourne, United Kingdom

Filed Jun. 21, 1994, Ser. No. 24,756

Term of patent 14 years

U.S. Cl. D24—110



363,776
ENDOSCOPIC GUIDEWIRE FOR A CATHETER

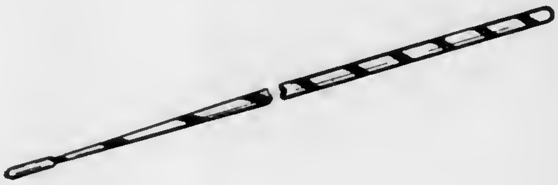
Christopher A. Rowland, Marlboro; Earl F. Bardsley, Arlington, and Richard DeMello, Acton, all of Mass., assignors to Boston Scientific Corporation, Natick, Mass.

Filed Aug. 16, 1993, Ser. No. 11,820

The portion of the term of this patent subsequent to Oct. 24, 2009, has been disclaimed.

Term of patent 14 years

U.S. Cl. D24—140



363,777

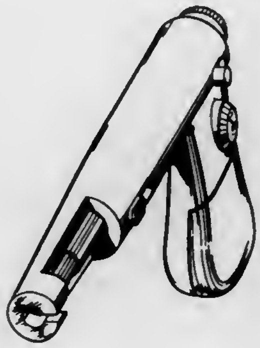
HAND HELD ANGIOPLASTY SURGICAL INSTRUMENT FOR RECIPROCATING A GUIDEWIRE WITHIN A CATHETER

Michael R. Rees, Newcastle under Lyme, England, assignor to Medical Miracles Company, West Yorkshire, England

Filed Apr. 20, 1994, Ser. No. 21,781

Term of patent 14 years

U.S. Cl. D24—146



363,778

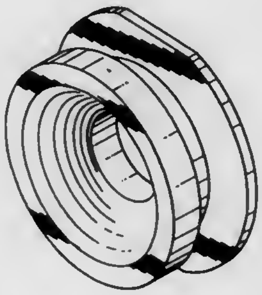
COUPLER FOR ADAPTING A BEAM SPLITTER TO AN OTOSCOPE

Richard M. Cane, and Wayne R. Byard, both of 13790 N.W. 4th Street, Sunrise, Fla. 33325

Filed Feb. 22, 1993, Ser. No. 5,079

Term of patent 14 years

U.S. Cl. D24—172



363,779

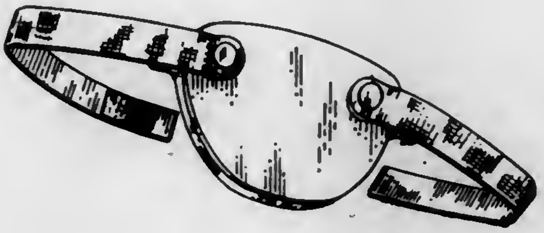
SANITARY EYE PATCH

James H. Auburn, Jr., P.O. Box 1205, Poway, Calif. 92074

Filed May 2, 1994, Ser. No. 22,132

Term of patent 14 years

U.S. Cl. D24—189



363,780

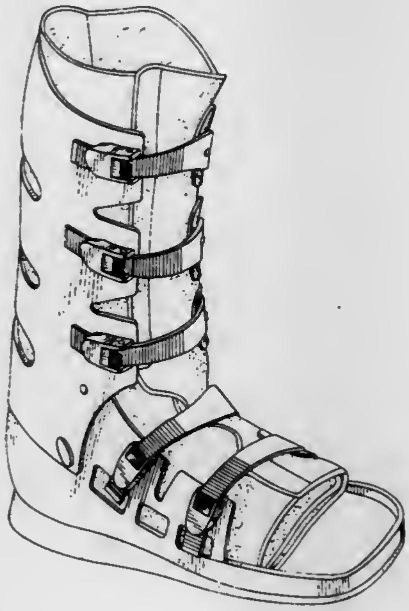
IMMOBILIZATION BRACE

H. Darrel Darby, and H. Darrel Darby, II, both of Huntington, W. Va., assignors to Darco International Corporation, Huntington, W. Va.

Filed Feb. 22, 1994, Ser. No. 18,990

Term of patent 14 years

U.S. Cl. D24—192



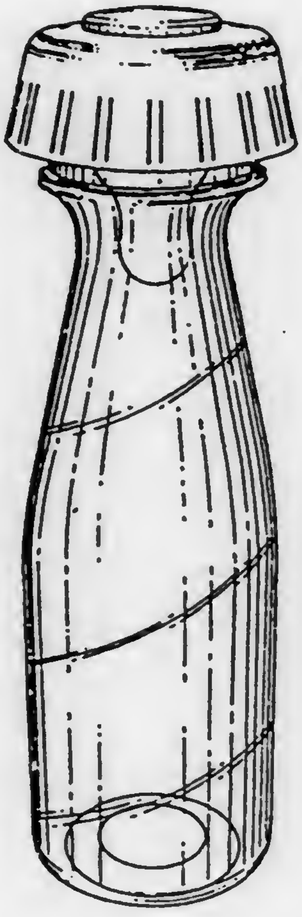
363,781
BABY BOTTLE

Steven B. Dunn, Beverly Hills, Calif., assignor to Munchkin Bottling, Inc., Van Nuys, Calif.

Filed Apr. 23, 1993, Ser. No. 7,480

Term of patent 14 years

U.S. Cl. D24—197



363,782
Patent Not Issued For This Number

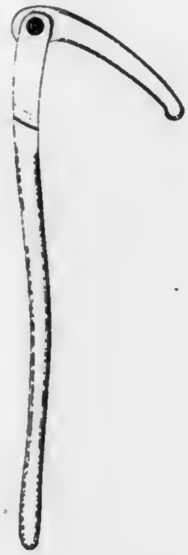
363,783
FOLDING HAND-HELD ACCUPRESSURE MASSAGER

William G. Malis, 1013 S. Locust St., Oxford, Ohio 45056

Filed Sep. 6, 1994, Ser. No. 28,042

Term of patent 14 years

U.S. Cl. D24—214



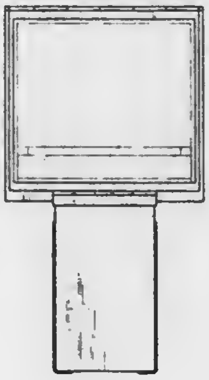
363,784
COMBINED WINDOW AND FIRE ESCAPE

Lawrence N. Lund, Site 11 Compartment 2 R.R. 1, Smithers, British Columbia, Canada

Filed Nov. 29, 1993, Ser. No. 15,775

Term of patent 14 years

U.S. Cl. D25—64



363,785

EDGING STRIP FOR TILED STEPS

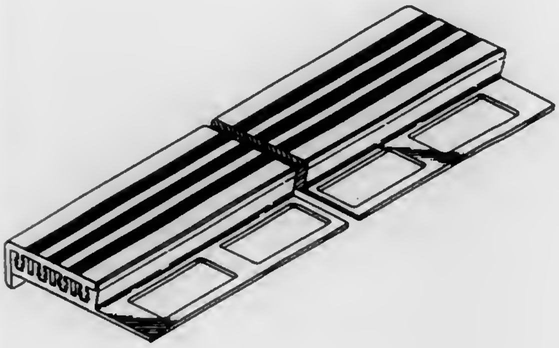
Alan J. E. Davies, Hednesford, England, assignor to McKechnie UK Limited, Walsall, England

Filed Dec. 21, 1994, Ser. No. 32,565

Claims priority, application United Kingdom, Jun. 30, 1994, 2040047

Term of patent 14 years

U.S. Cl. D25—69



363,786

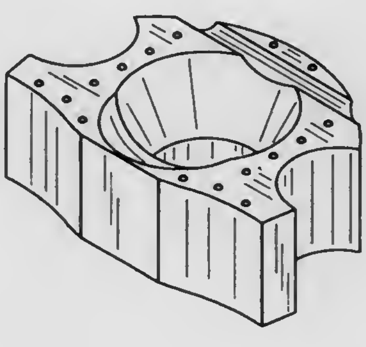
RETAINING WALL STONE

John M. Sowders, St. Louis, Mo., assignor to Magnum Stone, Inc., St. Louis County

Filed Aug. 24, 1994, Ser. No. 27,548

Term of patent 14 years

U.S. Cl. D25—117



363,787

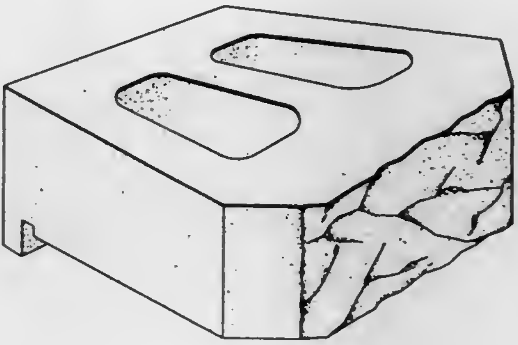
RETAINING WALL BLOCK

Arthur T. Powell, Lehi, Utah, assignor to Lehi Block Co., Lehi, Utah

Filed Jun. 13, 1994, Ser. No. 24,372

Term of patent 14 years

U.S. Cl. D25—118



363,788

TILE EDGING STRIP

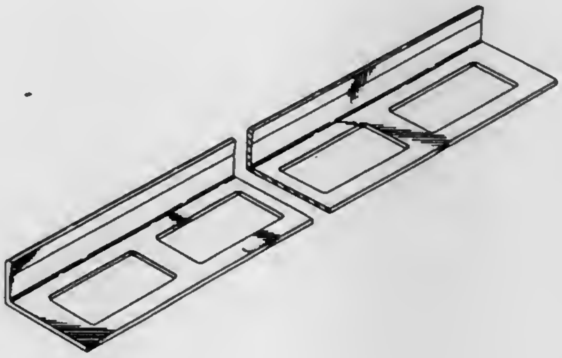
Malcolm Caley, Burton Upon Trent, England, assignor to McKechnie UK Limited, Walsall, England

Filed Dec. 21, 1994, Ser. No. 32,576

Claims priority, application United Kingdom, Jun. 30, 1994, 2040051

Term of patent 14 years

U.S. Cl. D25—119



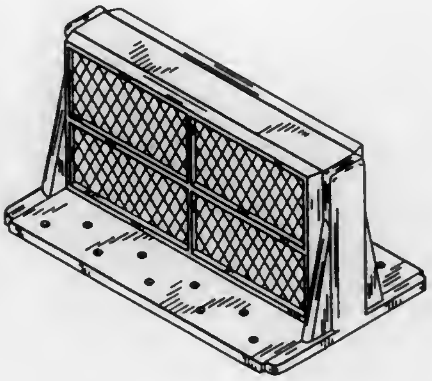
363,789
BARRICADE MARKER

Karl Weid, 1276 Robinwood Dr., Elgin, Ill. 60123

Filed Nov. 18, 1994, Ser. No. 31,114

Term of patent 14 years

U.S. Cl. D25—38



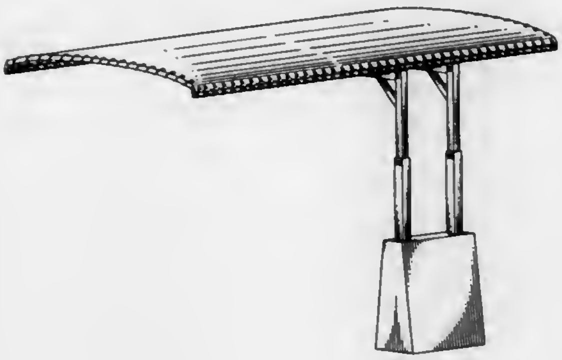
363,790
CANTILEVERED CARPORT

Anthony B. Boyd, 8336 N. Allentown Rd., Kansas City, Mo. 64151

Filed Mar. 28, 1994, Ser. No. 20,488

Term of patent 14 years

U.S. Cl. D25—56



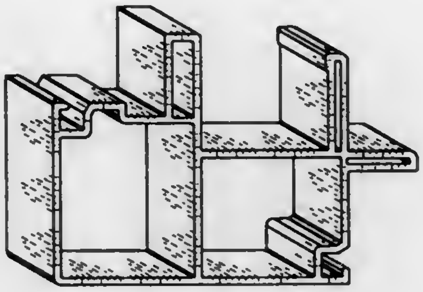
363,791
WINDOW COMPONENT EXTRUSION

Robert A. Schrader, Puyallup, Wash., assignor to Mikron Industries, Inc., Kent, Wash.

Filed Sep. 12, 1994, Ser. No. 28,305

Term of patent 14 years

U.S. Cl. D25—124



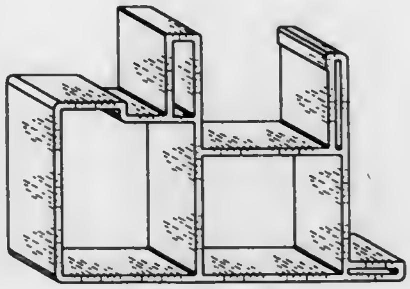
363,792
WINDOW COMPONENT EXTRUSION

Robert A. Schrader, Puyallup, Wash., assignor to Mikron Industries, Inc., Kent, Wash.

Filed Sep. 13, 1994, Ser. No. 28,354

Term of patent 14 years

U.S. Cl. D25—124



363,793

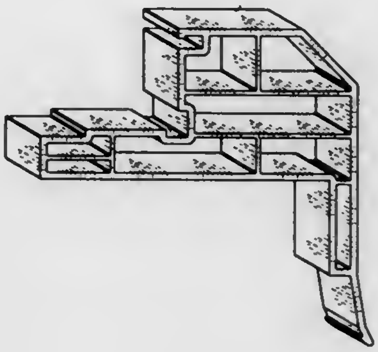
WINDOW COMPONENT EXTRUSION

Michael D. Lockbeam, Tacoma, Wash., assignor to Mikron Industries, Inc., Kent, Wash.

Filed Sep. 13, 1994, Ser. No. 28,363

Term of patent 14 years

U.S. Cl. D25—124



363,794

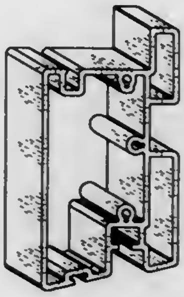
WINDOW COMPONENT EXTRUSION

Robert A. Schrader, Puyallup, Wash., assignor to Mikron Industries, Inc., Kent, Wash.

Filed Sep. 13, 1994, Ser. No. 28,365

Term of patent 14 years

U.S. Cl. D25—124



363,795

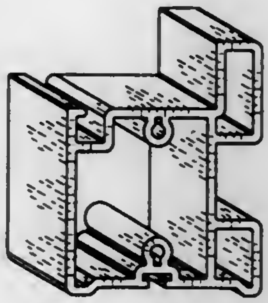
WINDOW COMPONENT EXTRUSION

Robert A. Schrader, Puyallup, Wash., assignor to Mikron Industries, Inc., Kent, Wash.

Filed Sep. 13, 1994, Ser. No. 28,380

Term of patent 14 years

U.S. Cl. D25—124



363,796

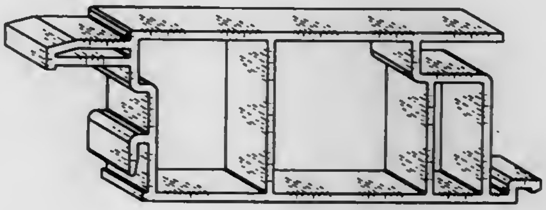
WINDOW COMPONENT EXTRUSION

Sam S. Hosseini, Renton, Wash., assignor to Mikron Industries, Inc., Kent, Wash.

Filed Sep. 14, 1994, Ser. No. 28,417

Term of patent 14 years

U.S. Cl. D25—124



363,797
PRY GUARD HEADER ELEMENT

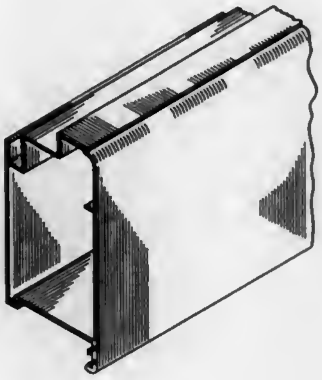
Joseph C. Bancroft, 102 Sweetwater Club Blvd., Longwood, Fla. 32750

Filed Nov. 10, 1994, Ser. No. 30,879

The portion of the term of this patent subsequent to Jun. 27, 2004, has been disclaimed.

Term of patent 14 years

U.S. Cl. D25—124



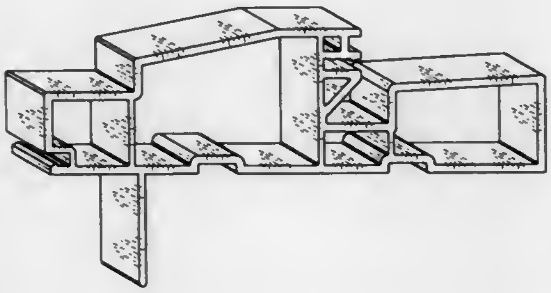
363,798
WINDOW COMPONENT EXTRUSION

Sam S. Hosseini, Renton, Wash., assignor to Mikron Industries, Inc., Kent, Wash.

Filed Sep. 14, 1994, Ser. No. 28,415

Term of patent 14 years

U.S. Cl. D25—125



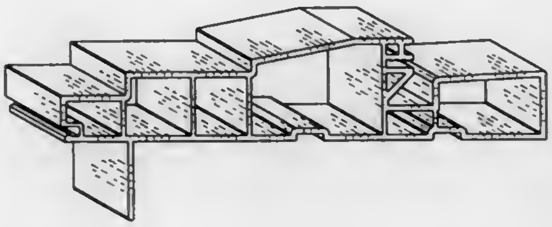
363,799
WINDOW COMPONENT EXTRUSION

Sam S. Hosseini, Renton, Wash., assignor to Mikron Industries, Inc., Kent, Wash.

Filed Sep. 14, 1994, Ser. No. 28,425

Term of patent 14 years

U.S. Cl. D25—125



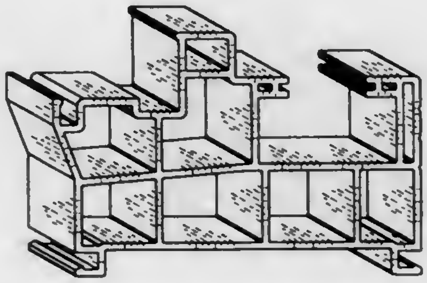
363,800
WINDOW COMPONENT EXTRUSION

Lorane C. Goss, Jr., Slippery Rock, Pa., assignor to Mikron Industries, Inc., Kent, Wash.

Filed Dec. 15, 1994, Ser. No. 32,244

Term of patent 14 years

U.S. Cl. D25—125



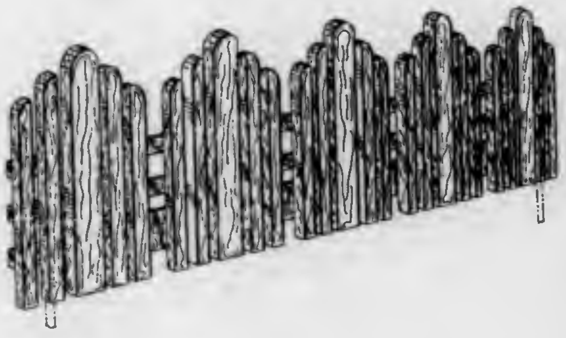
363,801
BORDER EDGE

Lavergne Nauseda, Antioch, Ill., assignor to Filtertek, Inc., Hebron, Ill.

Filed Aug. 23, 1993, Ser. No. 12,078

Term of patent 14 years

U.S. Cl. D25—164



363,802

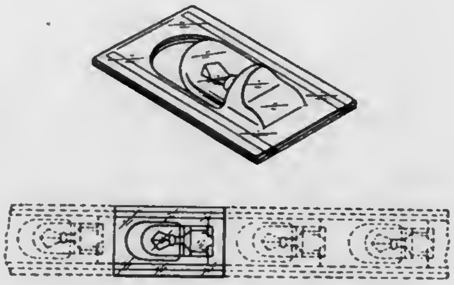
DECORATIVE LAMP FOR LIGHT STRIP

Kazuaki Murata, Tokyo, Japan, assignor to Moriyama Sangyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 15, 1994, Ser. No. 19,926

Term of patent 14 years

U.S. Cl. D26—25



363,803

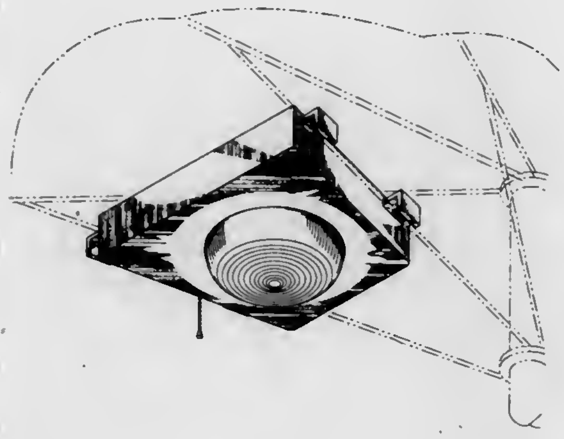
DECORATIVE LIGHT FOR PATIO UMBRELLA

Susan Kelly, 93 Jacobs Creek Rd., West Trenton, N.J. 08628

Filed Aug. 8, 1994, Ser. No. 26,934

Term of patent 14 years

U.S. Cl. D26—60



363,804

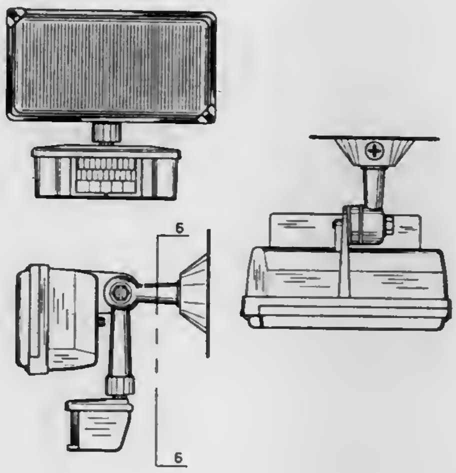
FLOODLIGHT AND MOTION SENSOR COMBINATION

Andrew J. Parker, Chapel Hill, and Edward R. Small, Elon College, both of N.C., assignors to Regent Lighting Corporation, Burlington, N.C.

Filed Oct. 27, 1994, Ser. No. 30,344

Term of patent 14 years

U.S. Cl. D26—63



363,805

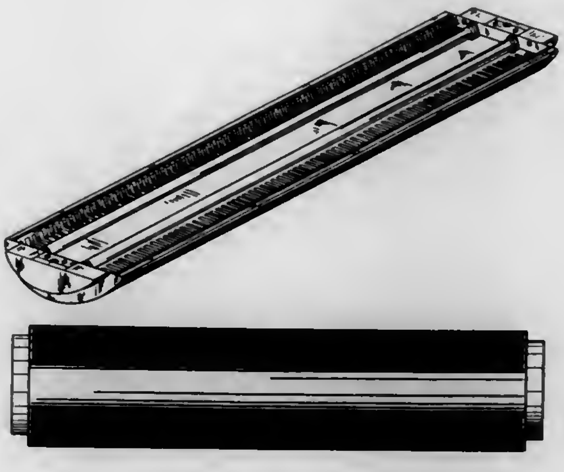
FLUORESCENT LIGHTING FIXTURE

John M. Cole, Jr., Hingham, Mass., assignor to Litecontrol Corporation, Hanson, Mass.

Filed Aug. 5, 1993, Ser. No. 11,476

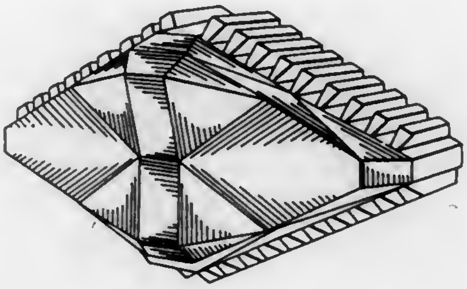
Term of patent 14 years

U.S. Cl. D26—76



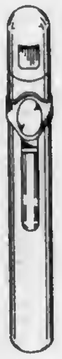
363,806
VEHICLE LAMP

George C. Kasboske, 2820 N. Whipple, Chicago, Ill. 60618
Filed Nov. 2, 1993, Ser. No. 14,883
Term of patent 14 years
U.S. Cl. D26—28



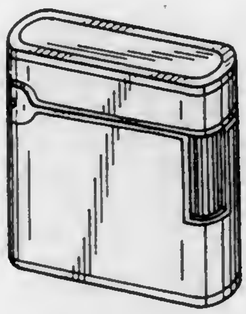
363,807
CIGARETTE LIGHTER

Walter G. Fontaine, Jr., Narragansett, R.I., assignor to Colibri Corporation, Providence, R.I.
Filed Nov. 3, 1994, Ser. No. 30,592
Term of patent 14 years
U.S. Cl. D27—141



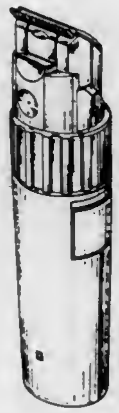
363,808
LIGHTER

Philippe Compte, Paris, France, assignor to S. T. DuPont S.A., Paris, France
Filed Sep. 13, 1994, Ser. No. 28,387
Claims priority, application France, Apr. 12, 1994, 942090
Term of patent 14 years
U.S. Cl. D27—159

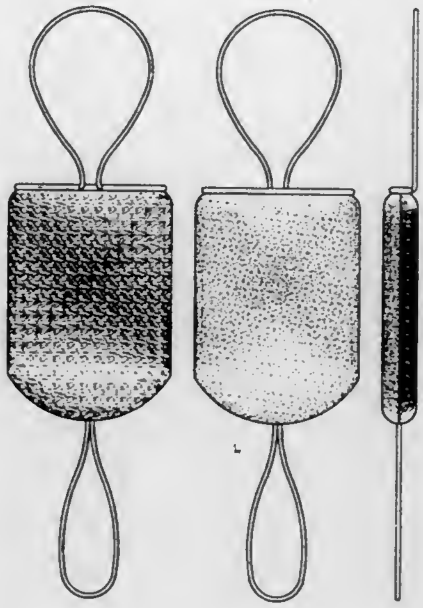


363,809
BEARD TRIMMER

Martin Bone, Groningen, Netherlands, assignor to U.S. Phillips Corporation, New York, N.Y.
Filed Jun. 15, 1994, Ser. No. 24,487
Claims priority, application WIPO, Dec. 28, 1993, DM/028 240
Term of patent 14 years
U.S. Cl. D28—53



363,810
BODY SCRUBBER
Charles C. Smith, Jr., 2313 Owen St., Saginaw, Mich. 48601
Filed Jan. 17, 1995, Ser. No. 33,545
Term of patent 14 years
U.S. Cl. D28—63



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LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 31th DAY OF OCTOBER, 1995

NOTE— Arranged in accordance with the first significant character or word of the name
(in accordance with city and telephone directory practice).

- A. Ahlstrom Corporation: *See—*
  - Niskanen, Toivo; and Peltonen, Kari, 5,462,585, Cl. 95-261.000.
- A. & J. Stockli AG: *See—*
  - Marti, Hans-Rudolf, 5,462,195, Cl. 220-752.000.
- ABB Industry Oy: *See—*
  - Törmä, 5,463,302, Cl. 318-807.000.
- ABB Management AG: *See—*
  - Schegk, Claus-Detlef, 5,461,860, Cl. 60-611.000.
- Abbey Etna Machine Company: *See—*
  - Abbey, Nelson D., III; Dreier, Richard L.; and Taber, Susan J., 5,461,896, Cl. 72-181.000.
- Abbey, Nelson D., III; Dreier, Richard L.; and Taber, Susan J., to Abbey Etna Machine Company. Automated changeover tube mill. 5,461,896, Cl. 72-181.000.
- Abbott Laboratories: *See—*
  - Minick, Steven E.; Lawless, Michael W.; Soberon, Peter A.; Kaul, Ashok; and Hermann, Robert A., 5,462,256, Cl. 251-331.000.
  - Riley, David A.; Chamberlin, Steven A.; and Bhatia, Ashok V., 5,463,142, Cl. 568-833.000.
  - Wang, Nai-Yi; Dubler, Robert E.; Ungemach, Frank S.; Walters, Roland L.; and Thacker, Susan A., 5,463,027, Cl. 530-388.900.
- Abdulally, Igbal F., to Foster Wheeler Energy Corporation. System for decreasing NO_x emissions from a fluidized bed reactor. 5,462,718, Cl. 422-171.000.
- ABE Electronics, Inc.: *See—*
  - Armstrong, Richard W., 5,461,908, Cl. 73-118.100.
- Abe, Fumio; Kondo, Tomoharu; and Deguchi, Yuuji, to NGK Insulators, Ltd. Heater unit. 5,463,206, Cl. 219-553.000.
- Abe, Jun: *See—*
  - Inaba, Shigeru; Fukuhara, Masaaki; Hirota, Makoto; Yamamoto, Mitsuo; Abe, Jun; Miyata, Hideaki; Sunaga, Takayuki; Ishikawa, Toru; Shiina, Yoshio; Isosu, Toru; and Kanno, Makoto, 5,463,452, Cl. 355-246.000.
- Abe, Tetsuya: *See—*
  - Ito, Takayuki; and Abe, Tetsuya, 5,463,499, Cl. 359-692.000.
- Abelman, Matthew M.: *See—*
  - Fevig, John M.; Abelman, Matthew M.; Amparo, Eugene C.; Cacciola, Joseph; Kettner, Charles A.; Pacofsky, Gregory J.; and Wang, Chia-Lin, 5,462,964, Cl. 514-423.000.
- Aberkane, Ourida: *See—*
  - Born, Maurice; Aberkane, Ourida; Mieloszynski, Jean-Luc; Paquer, Daniel; and Parc, Guy, 5,463,132, Cl. 568-22.000.
- Abusleme, Julio A.; and Colaianna, Pasqua, to Ausimont, S.p.A. Thermoprocessable copolymers of tetrafluoroethylene. 5,463,006, Cl. 526-247.000.
- Achard, Daniel; Grisoni, Serge; Malleron, Jean-Luc; Peyronel, Jean-Francois; and Tabart, Michel, to Rhone-Poulenc Rorer S.A. Perhydroisoindole derivatives and preparation. 5,463,077, Cl. 548-515.000.
- ACO Severin Ahlmann GmbH & Co., KG: *See—*
  - Sauerwein, Heinrich; and Arm, Wolfgang, 5,462,382, Cl. 404-2.000.
- Acquaviva, Thomas; Rees, James D.; Morgan, Paul F.; and Ferrara, Joseph J., to Xerox Corporation. Document reproduction system including a duplex document handler with natural inversion. 5,463,451, Cl. 355-233.000.
- Acutronic AG: *See—*
  - Havlicsek, Howard S., 5,463,393, Cl. 341-115.000.
- Acutus Industries, Inc.: *See—*
  - Ives, Kenneth D.; and McClellan, John T., 5,461,933, Cl. 73-862.623.
- Adachi, Hideaki; Setsune, Kentaro; and Mizuno, Koichi, to Matsushita Electric Industrial Co., Ltd. Method of forming Hg-containing oxide superconducting films. 5,462,921, Cl. 505-473.000.
- Adachi, Teruhiko: *See—*
  - Mikoshiba, Yoshihisa; Adachi, Teruhiko; and Tajiri, Kouji, 5,462,802, Cl. 428-376.000.
- Adams, Sally E.: *See—*
  - Kingsman, Alan J.; Kingsman, Susan M.; Adams, Sally E.; Mellor, Elizabeth J. C.; and Malim, Michael H., 5,463,024, Cl. 530-350.000.
- Adams, Samuel F.; and Bolz, Hans-Peter, to Sonoco Products Company. Plastic spacer ring having an annular groove for sealing plastic dye tubes. 5,461,889, Cl. 68-189.000.
- ADC Telecommunications, Inc.: *See—*
  - Ziebol, Robert J., 5,463,704, Cl. 385-22.000.
- Aderka, Dan; Maor, Yasmin; Wallach, David; and Revel, Michel, to Yeda Research and Development Company Ltd. Use of IL-6 for the treatment of chronic lymphocyte leukemia (CLL) and B-cell lymphomas. 5,462,731, Cl. 424-85.200.
- Adidas AG: *See—*
  - Luthi, Simon; Kälin, Xavier; Scholz, Wolfgang; and Stüssi, Edgar, 5,461,800, Cl. 36-28.000.
- Adkins, Mark W.: *See—*
  - Carpenter, Allan L.; and Adkins, Mark W., 5,463,193, Cl. 181-207.000.
- Adkins, Ronald R.; Fabbrini, Charles J.; and Strand, Neal T., to Minnesota Mining and Manufacturing Company. Screen printing process using water-based chemical composition. 5,462,768, Cl. 427-265.000.
- Adonakis, Nikolaos A.: *See—*
  - Burkett, Michael J.; and Adonakis, Nikolaos A., 5,461,967, Cl. 92-71.000.
- Advance Car Wash Equipment, Inc.: *See—*
  - Nittoli, Frank J., 5,461,745, Cl. 15-97.300.
- Advanced Container Corporation: *See—*
  - Bacchetti, Mark R.; Heiskell, Ronald E.; and Theys, Ezra E., 5,462,220, Cl. 229-112.000.
- Advanced Extraction Technologies, Inc.: *See—*
  - Wood, Glenn C.; and Mehra, Yuv R., 5,462,583, Cl. 95-192.000.
- Advanced Protocol Systems, Inc.: *See—*
  - Kruse, Robert J.; Law, Harmon F.; and Wagner, Steven R., 5,463,616, Cl. 370-24.000.
- Advanced Systems, Inc.: *See—*
  - Wiggins, Ralphe; Smith, Elizabeth; and Shanbaum, Suzanne P., 5,463,727, Cl. 395-156.000.
- Advanced Techtronics, Inc.: *See—*
  - Rapoport, Uri; and Panosh, Richard, 5,462,054, Cl. 128-653.500.
- Advantest Corporation: *See—*
  - Koishi, Tetsuya; Akiyama, Noboru; and Kumai, Yasuto, 5,463,639, Cl. 371-27.004.
- AE Piston Products Limited: *See—*
  - Wood, Graham R., 5,461,776, Cl. 29-888.072.
- AEG Transportation Systems, Inc.: *See—*
  - Wilson, Richard A., Jr.; Daubner, John M.; and Jeffers, Frank D., 5,463,552, Cl. 364-436.000.
- AEG Westinghouse Transport-Systeme GmbH: *See—*
  - Körber, Joachim; Niemann, Klaus; Frederich, Fritz; and Günther, Christian, 5,463,550, Cl. 364-426.010.
- Aerojet-General Corporation: *See—*
  - Manser, Gerald E.; Malik, Aslam A.; and Archibald, Thomas G., 5,463,019, Cl. 528-402.000.
- Aerospatiale Societe Nationale Industrielle: *See—*
  - Aubry, Jacques A.; and Bonfils, Michel R., 5,462,137, Cl. 188-72.600.
- Aerts, Ronny A. W.: *See—*
  - Ward, Dennis M.; Aerts, Ronny A. W.; Meijer, Jean-Pierre; Arnswald, Silke; Sandoval, Gerald A.; and Schneemann, Herbert, 5,463,555, Cl. 364-468.000.
- Ag-Bag International: *See—*
  - Garvin, Ronald V.; Inman, Larry R.; and Schuette, Arthur P., 5,461,843, Cl. 53-434.000.
- Agar Corporation Inc.: *See—*
  - Farchi, David; and Agar, Joram, 5,461,930, Cl. 73-861.040.
- Agar, Joram: *See—*
  - Farchi, David; and Agar, Joram, 5,461,930, Cl. 73-861.040.
- Agfa-Gevaert AG: *See—*
  - Klötzer, Sieghart; and Mücke, Bruno, 5,462,843, Cl. 430-503.000.
- AGFA-Gevaert N.V.: *See—*
  - Carleer, Lode, 5,462,841, Cl. 430-396.000.
  - Hauquier, Guido; Cortens, Willem; Coppens, Paul; Vermeersch, Joan; Mostaert, Erik; and Verschueren, Eric, 5,462,833, Cl. 430-159.000.
  - Jansen, Benedictus; Roefs, André; Sels, Francis; Perdieus, Pieter; and Florens, Raymond, 5,462,831, Cl. 430-139.000.
  - Janssens, Wilhelmus; and Vanmaele, Luc, 5,463,045, Cl. 546-158.000.
  - Roosen, Raymond; Van Gorp, Herman; and Monbaliu, Marcel, 5,462,822, Cl. 430-7.000.
- Agfa Gevart AG, D-51368: *See—*
  - Bergthaller, Peter, 5,463,072, Cl. 548-255.000.
- Agrafiotis, Dimitris K.; Bone, Roger F.; Salemme, Francis R.; and Soll, Richard M., to 3-Dimensional Pharmaceuticals, Inc. System and method of automatically generating chemical compounds with desired properties. 5,463,564, Cl. 364-496.000.
- Agta-Gevaerf AG: *See—*
  - Jonas, Friedrich, 5,463,056, Cl. 544-350.000.
- Ahlberg, Carl S.; Wilson, James A.; and Harrison, James R., to Minnesota Mining and Manufacturing Company. Floor mop and cleaning system. 5,461,749, Cl. 15-228.000.
- Ahmady, Farshid, to Solaronics. Ignitor with metering orifice insert. 5,462,431, Cl. 431-43.000.

- Ahmed, Munir. Endoscopic ligating instrument. 5,462,559, Cl. 606-140.000.
- Aimoto, Yoshiharu; and Sugibayashi, Tadahiko, to NEC Corporation. Dual port memory having a plurality of memory cell arrays for a high-speed operation. 5,463,591, Cl. 365-230.050.
- Air Products and Chemicals, Inc.: *See—*
  - Chen, Ning; Renz, Walter L.; and Pinschmidt, Robert K., Jr., 5,463,110, Cl. 560-172.000.
  - Pinschmidt, Robert K., Jr.; Dixon, Dale D.; Burgoyne, William F., Jr.; and Goldstein, Joel E., 5,463,007, Cl. 526-266.000.
- Airhart, Durwood: *See—*
  - Wardwell, Robert H.; and Airhart, Durwood, 5,463,324, Cl. 324-754.000.
- Aisin Seiki Kabushiki Kaisha: *See—*
  - Toda, Masataka; and Suganuma, Hiroyuki, 5,463,697, Cl. 382-199.000.
- Ajinomoto Co., Inc.: *See—*
  - Iino, Yukio; Ishii, Makoto; Ohsumi, Koji; and Tsuji, Takashi, 5,463,078, Cl. 548-541.000.
  - Sumikawa, Michito; Koguchi, Yoshihito; Ohgane, Takao; Irie, Yasuo; and Takahashi, Satoji, 5,463,116, Cl. 562-450.000.
- Akabane, Yukihiro: *See—*
  - Kan, Yoshio; Nakamura, Takeshi; and Akabane, Yukihiro, 5,462,489, Cl. 464-179.000.
- Akahori, Kingo; Ohta, Yoshiteru; Omura, Takashi; Fujita, Mahito; and Harada, Naoki, to Sumitomo Chemical Company, Limited. Bisazo compounds and method for dyeing or printing fiber materials using the same. 5,463,032, Cl. 534-642.000.
- Akahoshi, Yoshihiro: *See—*
  - Miyata, Hirofumi; Akahoshi, Yoshihiro; Ikeda, Eiichiro; and Furukawa, Yutaka, 5,462,492, Cl. 474-38.000.
- Akazawa, Taro: *See—*
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- Akiyama, Noboru: *See—*
  - Koishi, Tetsuya; Akiyama, Noboru; and Kumai, Yasuto, 5,463,639, Cl. 371-27.004.
- Aktsionernoe Obshestvo "SIGMA-GAZ" : *See—*
  - Finko, Valery E., 5,461,868, Cl. 62-5.000.
- Akzo N.V.: *See—*
  - Pick, John H.; and Logan, Robert T., 5,462,959, Cl. 514-400.000.
- Alagaratnam, Manian: *See—*
  - Chia, Chok J.; Alagaratnam, Manian; Low, Qwai H.; and Lim, Seng-Sooi, 5,463,529, Cl. 361-704.000.
- Albaugh, Virgil A.; Muhich, John S.; Silha, Edward J.; and Vanover, Michael T., to International Business Machines Corporation. Apparatus for vetoing reallocation requests during a data transfer based on data bus latency and the number of received reallocation requests below a threshold. 5,463,739, Cl. 395-826.000.
- Albers, Robert E.: *See—*
  - Falcoff, Allan F.; Delano, James A.; Albers, Robert E.; and Jankowski, Robert C., 5,462,601, Cl. 118-697.000.
- Albery, John W.; and Galley, Peter T., to Imperial College of Science, Technology & Medicine. Dialysis electrode device. 5,462,645, Cl. 204-153.120.
- Albion Industries, Inc.: *See—*
  - Rounds, Allan, 5,461,753, Cl. 16-21.000.
- Alcare Co., Ltd.: *See—*
  - Yokoyama, Genkichi; and Sekine, Takayuki, 5,461,885, Cl. 66-170.000.
- Alcatel N.V.: *See—*
  - Tooher, Michael, 5,463,630, Cl. 370-112.000.
- Alcon Laboratories, Inc.: *See—*
  - Schlitzer, Ronald L.; Dassanayake, N. L.; and Bhatia, Rajkumar P., 5,462,713, Cl. 422-37.000.
- Alday, Royce L., to Brown & Williamson Tobacco Corporation. Seal means between a rotating cylinder and stationary chute. 5,462,290, Cl. 277-95.000.
- Aldrich, Stephen H. Support pad for a stenographer machine. 5,462,247, Cl. 248-118.000.
- Alenia Aeritalia & Selenia S.p.A.: *See—*
  - Marrucci, Paolo; Sgarzi, Germano; and Vitale, Fabio, 5,463,566, Cl. 364-516.000.
- Alesi, Thomas W., Jr., to United States Surgical Corporation. Sternum buckle with serrated strap. 5,462,542, Cl. 606-151.000.
- ALFA Costruzioni Meccaniche S.P.A.: *See—*
  - Zacche', Vanni; Orlandi, Ireneo; and Pedercini, Maurizio, 5,462,632, Cl. 156-566.000.
- Alfa-Laval Food Engineering AB: *See—*
  - Johansson, Clas-Göran, 5,462,112, Cl. 165-167.000.
- Alfano, Robert R.; Ho, Ping-Pei; and Baldeck, Patrice. Terahertz repetition rate optical computing systems, and communication systems and logic elements using cross-phase modulation based optical processors. 5,463,485, Cl. 359-107.000.
- Alfille, Jean-Pascal, to Commissariat a l'Energie Atomique. Device for aligning the axis of a light beam with the axis of an optical fiber. 5,463,215, Cl. 250-206.100.
- Algazi, V. Ralph: *See—*
  - Ferrara, Katherine W.; and Algazi, V. Ralph, 5,462,059, Cl. 128-661.090.
- Allan, Edgar D.: *See—*
  - Blackbourn, Robert L.; Allan, Edgar D.; Le, Loc B.; and Patel, Snehal, 5,463,136, Cl. 568-385.000.
- Allen-Bradley Company, Inc.: *See—*
  - Fugere, Michael A.; and Halpert, David E., 5,463,296, Cl. 318-568.200.
  - Hager, Robert J.; Gibson, Warren K.; and Lyons, Oral G., 5,463,527, Cl. 361-685.000.
- Allen, Donald E., to Motorola, Inc. Surface acoustic wave filter and method. 5,463,361, Cl. 333-193.000.
- Allen, George S.: *See—*
  - Schohe, Rudolf; Glaser, Thomas; Traber, Jörg; and Allen, George S., 5,463,105, Cl. 560-29.000.
- Allen, John, to Target Marketing Limited. Projectile detection. 5,462,283, Cl. 273-371.000.
- Allen, Michael J.: *See—*
  - Tench, Robert J.; Siekhaus, Wigbert J.; Balooch, Mehdi; Balhorn, Rodney L.; and Allen, Michael J., 5,461,907, Cl. 73-105.000.
- Allen, Roy L. Versi-rake attachment. 5,461,849, Cl. 56-400.060.
- Allergan, Inc.: *See—*
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- AlliedSignal Inc.: *See—*
  - Beeson, Karl W.; Zimmerman, Scott M.; Ferm, Paul M.; and McFarland, Michael J., 5,462,700, Cl. 264-1.270.
  - Norling, Brian L., 5,463,233, Cl. 257-254.000.
- Allsop, Inc.: *See—*
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- Alnor Instrument Company: *See—*
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- Alps Electric Co., Ltd.: *See—*
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- Altera Corporation: *See—*
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- Altier, Mark R.: *See—*
  - Gutzmann, Timothy A.; and Altier, Mark R., 5,462,681, Cl. 252-11.000.
- Altman, Peter R.: *See—*
  - Vandenbelt, Rudy; and Altman, Peter R., 5,463,539, Cl. 362-189.000.
- Altrieth, Frederick E.: *See—*
  - Wilson, James; and Altrieth, Frederick E., 5,463,448, Cl. 355-202.000.
- Aluminum Company of America: *See—*
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  - Patrick, Edward P.; and Pajerski, A. Victor, 5,462,609, Cl. 148-241.000.
- Alvarez, Emilio: *See—*
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- Alvarez, Jose: *See—*
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- Alza Corporation: *See—*
  - Carr, John P.; Larsen, Steven D.; and Eckenhoff, James B., 5,462,741, Cl. 424-438.000.
  - Enscore, David J.; Campbell, Patricia S.; Osborne, James L.; Smart, Melinda K.; and Yum, Su I., 5,462,745, Cl. 424-448.000.
- Amada, Yoshiho: *See—*
  - Ito, Noritoshi; Amada, Yoshiho; and Wakabayashi, Osamu, 5,463,650, Cl. 372-57.000.
- Amano, Akira: *See—*
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- Amano, Hideaki: *See—*
  - Nakano, Masaaki; Inoue, Tomoaki; Amano, Hideaki; Takatsuka, Akio; Beppu, Osamu; Mori, Kenji; Yoshida, Takashi; and Kohno, Takashi, 5,463,511, Cl. 360-99.080.
- Amano, Ryuhei: *See—*
  - Kanayama, Hideyuki; Amano, Ryuhei; Yamauchi, Kenji; and Kanatani, Keiichi, 5,463,434, Cl. 353-94.000.
- Ambler, Robert D.; and Green, Rick L. Tree stand. 5,462,135, Cl. 182-187.000.
- American Air Liquide, Chicago Research Center: *See—*
  - Spencer, Kevin C.; Schvester, Pascal; and Boisrobert, Christine E., 5,462,861, Cl. 435-41.000.
- American Echo, Inc.: *See—*
  - Falbo, Michael G., Sr., 5,461,739, Cl. 5-607.000.
- American Home Products Corporation: *See—*
  - Skotnicki, Jerauld S.; and Palmer, Yvette L., 5,463,048, Cl. 540-456.000.
- American Science and Engineering, Inc.: *See—*
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- American Standard Inc.: *See—*
  - Hill, Joe T.; Williams, John R.; and Utter, Robert E., 5,462,419, Cl. 418-55.400.
- Amoco Corporation: *See—*
  - Lindemann, David C.; Chiang, Weilong L.; Luetkens, Melvin L., Jr.; Pischke, Robert D.; and Schubert, John C., 5,462,794, Cl. 428-317.100.
- Amparo, Eugene C.: *See—*
  - Fevig, John M.; Abelman, Matthew M.; Amparo, Eugene C.; Cacciola, Joseph; Kettner, Charles A.; Pacofsky, Gregory J.; and Wang, Chia-Lin, 5,462,964, Cl. 514-423.000.
- AMSTED Industries Incorporated: *See—*
  - Nassar, Rami V., 5,461,987, Cl. 105-167.000.
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  - Gschwind, Michel; and Ancey, Pascal, 5,462,608, Cl. 136-203.000.
- Andenmatten, Ronald P.: *See—*

Andenmatten, Roy W.; and Andenmatten, Ronald P., 5,462,078, Cl. 137-209.000.

- Andenmatten, Roy W.; and Andenmatten, Ronald P. Apparatus for eliminating hazardous materials from cargo tank wet line. 5,462,078, Cl. 137-209.000.
- Anderberg, Gôran. Sealing arrangement at lead-through shafts. 5,462,289, Cl. 277-65.000.
- Anderson, Barbara I.: *See—*
  - Dussan V., Elizabeth B.; Auzerais, François M.; and Anderson, Barbara I., 5,463,549, Cl. 364-422.000.
- Anderson, Charles R.; Warfield, Robert W.; Cseri, Istvan; Low, Murray K.; Liaw, Weikuo; and Bush, Alan M., to Borland International, Inc. System and methods for improved spreadsheet interface with user-familiar objects. 5,463,724, Cl. 395-148.000.
- Anderson, Louis R., to Niagara Therapy Manufacturing, Inc. Cyclical action massaging chair. 5,462,516, Cl. 601-99.000.
- Anderson, Scott C.: *See—*
  - Simpson, John B.; and Anderson, Scott C., 5,462,529, Cl. 604-101.000.
- Andersson, Bengt R.: *See—*
  - Svensson, Kjell A. I.; Wikstrom, Hakan V.; Carlsson, Per A. E.; Boije, Anna M. P.; Waters, R. Nicholas; Sonesson, Clas A.; Stjernlof, Nils P.; Andersson, Bengt R.; and Hansson, Lars O., 5,462,947, Cl. 514-317.000.
- Anderton, Graeme. Cleated athletic shoe with crisscross arch reinforcement. 5,461,801, Cl. 36-114.000.
- Ando, Takao: *See—*
  - Niimura, Koichi; Ikeda, Yuko; Kato, Ákira; and Ando, Takao, 5,462,957, Cl. 514-397.000.
- Andonov, Radomir: *See—*
  - Lonardi, Emile; Andonov, Radomir; and Cimenti, Giovanni, 5,462,260, Cl. 266-226.000.
- Andoo, Keikichi: *See—*
  - Miyamoto, Harukazu; Miyamoto, Makoto; Andoo, Keikichi; Niihara, Toshio; and Ojima, Masahiro, 5,462,811, Cl. 428-694.0EC.
- Andress, F. Jay, III. Apparatus and method for enabling a two-wheeled vehicle to travel along a railroad track. 5,461,984, Cl. 104-243.000.
- Andrews, Kenneth J.: *See—*
  - James, Douglas J.; Andrews, Kenneth J.; and McKee, Terrence J., 5,463,200, Cl. 219-121.680.
- Angaroni, Mariangela: *See—*
  - Neri, Carlo; Costanzi, Silvestro; and Angaroni, Mariangela, 5,462,984, Cl. 524-102.000.
- Angeion Corporation: *See—*
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- Angel, Maximilian: *See—*
  - Penzel, Erich; Franzmann, Gernot; Angel, Maximilian; Pakusch, Joachim; and Schuler, Bernhard, 5,462,978, Cl. 523-342.000.
- Anhalt, John W., to ITT Corporation. Switching connector. 5,462,445, Cl. 439-188.000.
- Anno, Toshihiko: *See—*
  - Shinjo, Teruya; Yamamoto, Hidefumi; Anno, Toshihiko; and Takada, Toshio, 5,462,795, Cl. 428-332.000.
- Annus, Gary D.; Barnette, William E.; McCann, Stephen F.; and Wing, Keith D. Arthropodicidal oxadiazinyl, thiadiazinyl and triazinyl carboxanilides. 5,462,938, Cl. 514-229.800.
- Anritsu Corporation: *See—*
  - Kuroyone, Kazuo, 5,462,424, Cl. 425-150.000.
- Anthony, Leonard. Mower pulley guard. 5,461,848, Cl. 56-320.100.
- Anzai, Noriko: *See—*
  - Nagahori, Takeshi; Oami, Toshimasa; and Anzai, Noriko, 5,463,345, Cl. 327-374.000.
- Anzai, Shouji: *See—*
  - Kageyama, Hidehei; Anzai, Shouji; and Mitsuya, Yoshihide, 5,462,376, Cl. 401-65.000.
- Aoe, Shigeru: *See—*
  - Ryu, Tadamitsu; Kakehi, Gen; and Aoe, Shigeru, 5,463,381, Cl. 340-825.150.
- Aoki, Naofumi: *See—*
  - Nakata, Naotaro; Aoki, Naofumi; and Okada, Kenji, 5,463,707, Cl. 385-35.000.
- Aoki, Nobuo: *See—*
  - Sumi, Yoshihiko; Ichikawa, Yataro; Aoki, Nobuo; and Muramatsu, Masami, 5,463,025, Cl. 530-380.000.
- Aoki, Takashi: *See—*
  - Seki, Kazuhiro; Aoki, Takashi; Hirahara, Shinichi; and Motozawa, Yasuki, 5,462,308, Cl. 280-749.000.
- Aoki, Takayoshi: *See—*
  - Yashiki, Yuichi; Hondumi, Masahiko; Ohki, Yuzuru; Ito, Takashi; Nakjajima, Fumitaka; Mori, Masakazu; Aoki, Takayoshi; Mizuishi, Harumitsu; and Shibuya, Yuusaku, 5,463,456, Cl. 355-299.000.
- Aoki, Tsuyoshi: *See—*
  - Waki, Masaki; Kasai, Junichi; Aoki, Tsuyoshi; Honda, Toshiyuki; and Sato, Hirotaka, 5,463,253, Cl. 257-724.000.
- Aono, Katsutoshi: *See—*
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- Aoyama, Susumu: *See—*
  - Toda, Junzo; and Aoyama, Susumu, 5,463,517, Cl. 360-113.000.
- Aoyama, Tateo, to Yamaha Hatsudoki Kabushiki Kaisha. Induction system for engine. 5,462,027, Cl. 123-432.000.
- APD Cryogenics Inc.: *See—*
  - Longsworth, Ralph C., 5,461,873, Cl. 62-51.100.
- Aphex Systems, Ltd.: *See—*
  - Werrbach, Donn, 5,463,695, Cl. 381-106.000.
- Aponte, Rene R.: *See—*
  - Hardigg, James S.; and Aponte, Rene R., 5,461,755, Cl. 16-112.000.
- Apple Computer, Inc.: *See—*
  - Beernink, Ernest H.; Pagallo, Giulia; and Bozinovic, Radmilo, 5,463,696, Cl. 382-186.000.
  - Venolia, Daniel S., 5,463,722, Cl. 395-133.000.
- Applied Biosystems, Inc.: *See—*
  - Lloyd, David H.; DeFranco, Robert J.; and Ladd, Charles S., 5,462,748, Cl. 424-484.000.
- Applied Materials, Inc.: *See—*
  - Fishkin, Boris; and Salzman, Phil, 5,463,460, Cl. 356-339.000.
  - Plavidal, Richard W.; Nitescu, Petru N.; Mudwilder, Greg; and Crockett, Richard, 5,462,080, Cl. 137-337.000.
- AptarGroup, Inc.: *See—*
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- Aragonés, Juan L. B., to Iskay Serviceis Metalurgicos Srl. Process for biolixiviating copper sulfides by indirect contact with separation of effects. 5,462,720, Cl. 423-27.000.
- Arakawa, Takeharu: *See—*
  - Nishida, Junichi; Araki, Morio; Arakawa, Takeharu; Ishida, Tessho; Ayukai, Yasushiro; Baba, Toshiharu; Sakaguchi, Masahiko; Nobe, Kenichi; Kaneko, Michihiro; and Shinohara, Jun, 5,463,605, Cl. 369-58.000.
- Arakawa, Takeshi: *See—*
  - Fukano, Yoshihiro; Makado, Shoichi; and Arakawa, Takeshi, 5,462,087, Cl. 137-884.000.
- Arakawa, Yasuyuki: *See—*
  - Hasegawa, Tamotsu; Arakawa, Yasuyuki; and Ota, Atushi, 5,462,107, Cl. 164-63.000.
- Araki, Kiyoshi: *See—*
  - Onoue, Takashi; Araki, Kiyoshi; Ishida, Noriya; Kitamura, Toshiya; Niitsu, Yasuhiko; Yanagisawa, Makiko; Sakamoto, Ryo; and Sato, Fumihiro, 5,462,821, Cl. 429-218.000.
- Araki, Minoru; and Miyama, Shinichi, to Tanaka Kogyo Co., Ltd. Filament-type trimming apparatus. 5,461,787, Cl. 30-276.000.
- Araki, Morio; Hayashi, Katsuyoshi; and Habu, Yukiko, to Pioneer Electronic Corporation. Navigation apparatus and navigation method. 5,463,553, Cl. 364-444.000.
- Araki, Morio; Hayashi, Katsuyoshi; and Habu, Yukiko, to Pioneer Electronic Corporation. Vehicle navigation system which automatically adjusts to a changed travel route. 5,463,554, Cl. 364-444.000.
- Araki, Morio: *See—*
  - Nishida, Junichi; Araki, Morio; Arakawa, Takeharu; Ishida, Tessho; Ayukai, Yasushiro; Baba, Toshiharu; Sakaguchi, Masahiko; Nobe, Kenichi; Kaneko, Michihiro; and Shinohara, Jun, 5,463,605, Cl. 369-58.000.
- Araki, Yoshitaka: *See—*
  - Konoike, Toshiro; Araki, Yoshitaka; Hayashi, Tetsuyoshi; Sakurai, Kensuke; and Tozyo, Takehiko, 5,463,107, Cl. 560-43.000.
- Arch Development Corporation: *See—*
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- Archer Daniels Midland Company: *See—*
  - Matlock, Mark G.; Sleeter, Ronald T.; and Jebe, Tod A., 5,463,321, Cl. 324-439.000.
  - Poppe, George; Ciesielski, Denise; and Matlock, Mark, 5,462,593, Cl. 106-124.000.
- Archibald, Thomas G.: *See—*
  - Manser, Gerald E.; Malik, Aslam A.; and Archibald, Thomas G., 5,463,019, Cl. 528-402.000.
- ARCO Chemical Technology, L.P.: *See—*
  - Gaffney, Anne M.; and Jones, C. Andrew, 5,462,971, Cl. 521-40.000.
  - Rodriguez, Carmen L.; and Zajacek, John G., 5,463,090, Cl. 549-531.000.
- Arda Technologies: *See—*
  - Talwalker, Ramesh T.; and Barve, Shirish S., 5,462,714, Cl. 422-37.000.
- Arends, Thomas C.; and Elliott, Randy D., to Spectra-Physics Scanning Systems, Inc. Method and apparatus for detecting transitions in a time sampled input signal. 5,463,211, Cl. 235-462.000.
- Arhancet, Juan P.: *See—*
  - Powell, Joseph B.; Slaugh, Lynn H.; Forschner, Thomas C.; Thomason, Terry B.; Semple, Thomas C.; Weider, Paul R.; and Arhancet, Juan P., 5,463,144, Cl. 568-867.000.
- Arii, Mitsuzo: *See—*
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- Arima, Hideki: *See—*
  - Tamazawa, Kazuharu; Kojima, Tadao; Arima, Hideki; Murakami, Yukiyasu; Isomura, Yasuo; Okada, Minoru; Takanobu, Kiyoshi; and Takenaka, Toichi, 5,463,064, Cl. 546-281.000.
- Arisato, Akira, to Kabushiki Kaisha Kosmek. Quick-acting coupling. 5,462,084, Cl. 137-614.030.
- Arita, Yoshinobu: *See—*
  - Awaya, Nobuyoshi; and Arita, Yoshinobu, 5,462,014, Cl. 118-725.000.
- Ariyama, Kenzo: *See—*
  - Kurotori, Tsuneo; Mochizuki, Manabu; Ariyama, Kenzo; Kojima, Kenji; Tsuruoka, Ichiro; Echigo, Katsuhiro; Miyao, Mayumi; and Ikeda, Itsuo, 5,463,453, Cl. 355-256.000.

Arlandis, Yves, to 5-These Industrie. Self-contained dispensing bollard of variable height. 5,462,384, Cl. 404-6.000.
Arm, Wolfgang: *See—*
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Armstrong, Richard W., to ABE Electronics, Inc. Automative diagnostic testing apparatus. 5,461,908, Cl. 73-118.100.
Arnaud, Alain; and Morin, Claude, to Saint-Gobain Vitrage International. Apparatus for the distribution of pulverulent solids onto the surface of a substrate in order to coat it. 5,462,596, Cl. 118-310.000.
Arnold, Dan M., to Halliburton Logging Services, Inc. Oxygen activation method for quantitative water flow measurements within and behind well bore casing. 5,461,909, Cl: 73-155.000.
Arnswald, Silke: *See—*
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Arrington, Stephen T.; and Bradley, Gary W., to HydroChem Industrial Services, Inc. Method of removing heavy metals from solutions of aminocarboxylic acids for disposal purposes. 5,462,671, Cl. 210-717.000.
Arthur, Larry O.; and Henderson, Louis E., to United States of America, Secretary, DHHS. HIV Nucleocapsid protein capture assay and method of use. 5,462,852, Cl. 435-5.000.
Aruga, Tamotsu: *See—*
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ASAA Technologies, Inc.: *See—*
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Asabe, Kazutaka; Nishiguchi, Masaru; and Yamamoto, Sukeyoshi, to Sumitomo Metal Industries, Ltd. Highly rigid composite material and process for its manufacture. 5,462,808, Cl. 428-551.000.
Asada, Naoki; and Doi, Kunio, to Arch Development Corporation. Method and system for differential diagnosis based on clinical and radiological information using artificial neural networks. 5,463,548, Cl. 364-413.020.
Asahi Glass Company Ltd.: *See—*
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Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
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 Kawashima, Makoto; Nagano, Kazuhiro; Hori, Kazuyoshi; Ishikawa, Hiroaki; and Morishita, Masataka, 5,462,929, Cl. 514-43.000.
Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
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Asahi, Masahiko: *See—*
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Asahi Seiko Kabushiki Kaisha: *See—*
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Asami, Masahiro; Ohshima, Naoto; and Otani, Shigeaki, to Fuji Photo Film Co., Ltd. Silver halide photographic material. 5,462,850, Cl. 430-569.000.
Ascom Tech AG: *See—*
 Keller, Hansjoerg; Rao, Sathyanarayana; and Schuerch, Heinz-Christoph, 5,463,622, Cl. 370-60.100.
Asea Brown Boveri AB: *See—*
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Asept International AB: *See—*
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Ashby, Carol I. H.; Hohimer, John P.; Neal, Daniel R.; and Vawter, G. Allen, to Sandia Corporation. Monolithically integrated solid state laser and waveguide using spin-on glass. 5,463,649, Cl. 372-40.000.
Askin, David; Eng, Kan K.; and Volante, Ralph P., to Merck & Co., Inc. Process for making HIV protease inhibitors. 5,463,067, Cl. 548-113.000.
Aslanian, Robert: *See—*
 Shih, Neng-Yang; Aslanian, Robert; Lupo, Andrew, Jr.; Piwinski, John J.; Green, Michael J.; and Ganguly, Ashit K., 5,463,074, Cl. 548-314.700.
Association pour la Recherche et le Development des Methodes et Processus Industriels (Armines): *See—*
 Meyer, Fernand, 5,463,698, Cl. 382-276.000.
Asthana, Anjan; Henry, James P.; and Hamilton, Melissa A., to General Motors Corporation. Dual slope flow control valve. 5,462,253, Cl. 251-121.000.
AT&T Corp.: *See—*
 Bash, Stephan R.; Di Rubbo, Salvatore R. L.; Gibilisco, Paul F.; and Mansdoerfer, Richard L., Jr., 5,463,677, Cl. 379-88.000.
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 Collins, Cynthia B.; Lee, Young; and Tagatac, Daniel D., 5,463,683, Cl. 379-201.000.
 Leonowich, Robert H., 5,463,337, Cl. 327-158.000.
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 Millios, William L.; and Schulz, David E., 5,463,665, Cl. 379-52.000.
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AT&T Global Information Solutions Company: *See—*
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 Chiang, Marilyn C.; Fenley, R. Earl, Jr.; Holland, George F.; Javvaji, Anand K.; and Sreedhara, Ramadevi, 5,463,670, Cl. 379-27.000.
 Chiu, Tzu-Yin; Erceg, Frank M.; Krafty, Francis A.; Liu, Te-Yin M.; Possanza, William A.; and Sung, Janmye, 5,462,888, Cl. 437-57.000.
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 Dorward, Sean M.; Jayant, Nuggehally S.; Johnston, James D.; Quackenbush, Schuyler R.; Seshadri, Nambirajan; and Sundberg, Carl-Erik W., 5,463,641, Cl. 371-374.000.
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 Grimes, Gary J., 5,463,488, Cl. 359-128.000.
 Grimes, Gary J.; and Quinn, Thomas M., 5,463,623, Cl. 370-79.000.
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 Nealon, William J.; and Rajan, Heidi A., 5,463,659, Cl. 375-202.000.
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Atelier D'usinage Cormier & Freres Inc.: *See—*
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Athena Neurosciences, Inc.: *See—*
 Evenstad, Kenneth L.; O'Neill, Victoria A.; and Gorham, Thomas R., 5,462,740, Cl. 424-436.000.
Atlantic Richfield Company: *See—*
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 Perkins, Thomas K., 5,463,164, Cl. 588-250.000.
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 Satija, Sunil; Wade, Daniel M.; and Reynolds, Ronald C., 5,462,709, Cl. 264-211.000.
Aubry, Jacques A.; and Bonfils, Michel R., to Aerospatiale Societe Nationale Industrielle. Gyroplane rotor braking unit. 5,462,137, Cl. 188-72.600.
Audeh, Costandi A.; Shihabi, David S.; Socha, Richard F.; and Stevenson, Scott A., to Mobil Oil Corporation. Process for the removal of hydrogen cyanide from FCC hydrocarbon product gas streams. 5,463,168, Cl. 585-854.000.
Audiopack Sound Systems Inc.: *See—*
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Auer, Engelbert: *See—*
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Auf dem Venne, Johannes: *See—*
 Kastingschafer, Gerhard; Auf dem Venne, Johannes; Pingel, Herbert; Giesemann, Reinhard; Peterwerth, Bernhard; Gerhardt, Klaus; and Gebbe, Reinhold, 5,462,370, Cl. 384-549.000.
August Bilstein GmbH & Co. KG: *See—*
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Auravision Corporation: *See—*
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Ausimont, S.p.A.: *See—*
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Ausimont S.r.l.: *See—*
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Auspharm International Limited: *See—*
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Austel, Volkhard: *See—*
 Himmelsbach, Frank; Linz, Guenter; Austel, Volkhard; Pieper, Helmut; Mueller, Thomas; Weisenberger, Johannes; and Seewaldt-Becker, Elke, 5,463,071, Cl. 548-251.000.
Australia Sonar Systems Pty Ltd: *See—*
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Automatic Liquid Packaging, Inc.: *See—*
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Avecor Cardiovascular, Inc.: *See—*

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Avery Dennison Corporation: *See—*

Caldwell, Carol A., 5,462,540, Cl. 604-389.000.

Awaya, Nobuyoshi; and Arita, Yoshinobu, to Nippon Telegraph and Telephone Corporation. Apparatus for growing a thin metallic film. 5,462,014, Cl. 118-725.000.

Ayabe, Toshihiko: *See—*

Ichinose, Toshiaki; Ninomiya, Takanori; Kuni, Asahiro; Nakahata, Kozo; Hamada, Toshimitsu; and Ayabe, Toshihiko, 5,463,667, Cl. 378-58.000.

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Azad, A. R. M.; and Goffe, Randal A., to Hemasure, Inc. Covalent attachment of macromolecules to polysulfones or polyethersulfones modified to contain functionalizable chain ends. 5,462,867, Cl. 435-181.000.

Azuma, Toshikazu: *See—*

Hioki, Yuichi; Kurita, Kazuhiko; Kawabata, Keiko; and Azuma, Toshikazu, 5,462,912, Cl. 504-116.000.

Azuma, Toshiro; Seno, Yasuo; Kitagawara, Hiroshi; and Nemoto, Shusuke, to Kanzaki Kokyukoki Mfg. Co., Ltd. Vehicle multi-ratio transmission. 5,462,148, Cl. 192-48.300.

Azzolini, Raymond; and Rochard, Pierre, to Commissariat a l'Energie Atomique. Device for compressing a specimen at high temperature, in particular for advanced tensile materials. 5,461,928, Cl. 73-818.000.

B & J Manufacturing Co.: *See—*

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B. F. Goodrich FlightSystems, Inc.: *See—*

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Baba, Toshiharu: *See—*

Nishida, Junichi; Araki, Morio; Arakawa, Takeharu; Ishida, Tessho; Ayukai, Yasushiro; Baba, Toshiharu; Sakaguchi, Masahiko; Nobe, Kenichi; Kaneko, Michihiro; and Shinohara, Jun, 5,463,605, Cl. 369-58.000.

Babcock & Wilcox Company, The: *See—*

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Jung, Udo; Eidam, Herbert; and Gerk, Wilhelm, 5,462,484, Cl. 454-187.000.

Bacchetti, Mark R.; Heiskell, Ronald E.; and Theys, Ezra E., to Advanced Container Corporation. Shipping and display box. 5,462,220, Cl. 229-112.000.

Bachovchin, William W.; Plaut, Andrew G.; and Flentke George R., to New England Medical Center Hospitals, Inc.; and Tufts University. Inhibitors of dipeptidyl-aminopeptidase type IV. 5,462,928, Cl. 514-19.000.

Baeuerle, Dieter: *See—*

Hagemeyer, Alfred; Schildberg, Hans-Peter; Hibst, Hartmut; Baeuerle, Dieter; and Heitz, Johannes, 5,462,701, Cl. 264-482.000.

Bagersh, Abdullah A.: *See—*

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Bahrmann, Helmut; Greb, Wolfgana; Heymanns, Peter; Lappe, Peter; Müller, Thomas; Szameitat, Jürgen; and Wiebus, Ernst, to Hoechst Aktiengesellschaft. Decyl alcohol mixtures, phthalic esters obtainable therefrom and their use as placticizers. 5,462,986, Cl. 524-296.000.

Bahrmann, Helmut; Greb, Wolfgang; Heymanns, Peter; Lappe, Peter; Müller, Thomas; Szameitat, Jürgen; and Wiebus, Ernst, to Hoechst Aktiengesellschaft. Decyl alcohol mixtures, phthalic esters obtainable therefrom and their use as plasticizers. 5,463,147, Cl. 568-882.000.

Bailey, James R.; Hood, G. David; and Wasley, Alan A., to Innovative Medical Products Inc. Knee positioner. 5,462,551, Cl. 606-88.000.

Bailey, Richard A.; and Midavaine, John C., to Philips Electronics North America Corporation. CRT electron gun cleaning using carbon dioxide snow. 5,462,468, Cl. 445-59.000.

Bair, Owen S.; Yin, Patrick; and Chen, Chih-Chung, to LSI Logic Corporation. Automatic logic model generation from schematic data base. 5,463,563, Cl. 364-490.000.

Baker, Andrew R.; and Kettle, Richard L., to Brico Engineering Limited. Valve seat inserts of sintered ferrous materials. 5,462,573, Cl. 75-231.000.

Baker, Dwight. Gate valve. 5,461,778, Cl. 29-890.124.

Baker Hughes Incorporated: *See—*

Green, Robert R.; and Ireland, Kelly D., 5,462,117, Cl. 166-297.000.

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Baker, Michael E.: *See—*

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Baker, Peter, to Texaco Limited. Leak detection means and method. 5,461,904, Cl. 73-46.000.

Baker, S. Richard; Dillard, Robert D.; Floreancig, Paul E.; Sawyer, J. Scott; and Sofia, Michael J., to Eli Lilly and Company. Substituted phenyl phenol leukotriene antagonists. 5,462,954, Cl. 514-381.000.

Bakholdin, Daniel; Bosley, Robert W.; and Pearson, Chris C., to Rosen Motors, L.P. Flywheel energy storage system with integral molecular pump. 5,462,402, Cl. 415-90.000.

Balcar, Gerald P.; and Dwivedi, Anurag, to International Envirometting Corporation. Process for producing an environmentally acceptable abrasive product from hazardous wastes. 5,462,570, Cl. 65-17.100.

Baldeck, Patrice: *See—*

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Bale Oenick, Marsha D.; Detwiler, Richard L.; Eikenberry, Jon N.; and Sutherland, John W. H., to Eastman Kodak Company. Dry multilayer analytical elements for assaying transaminases. 5,462,858, Cl. 435-16.000.

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Tench, Robert J.; Siekhaus, Wigbert J.; Balooch, Mehdi; Balhorn, Rodney L.; and Allen, Michael J., 5,461,907, Cl. 73-105.000.

Balkcom, Charles W. Spinning rod assembly. 5,461,818, Cl. 43-23.000.

Balooch, Mehdi: *See—*

Tench, Robert J.; Siekhaus, Wigbert J.; Balooch, Mehdi; Balhorn, Rodney L.; and Allen, Michael J., 5,461,907, Cl. 73-105.000.

Balser, Klaus: *See—*

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Balun, Thomas J.: *See—*

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Bandag Licensing Corporation: *See—*

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Bando Chemical Industries, Ltd.: *See—*

Miyata, Hirofumi; Akahoshi, Yoshihiro; Ikeda, Eiichiro; and Furukawa, Yutaka, 5,462,492, Cl. 474-38.000.

Bang, Chan S.: *See—*

Kim, Yong Z.; Oh, Hun S.; Yeo, Jae H.; Lim, Jong C.; Bang, Chan S.; Kim, Won S.; and Yim, Hyeon J., 5,462,935, Cl. 514-206.000.

Banik, Niranjan; Land, Harry M.; and Levy, Edward W., to TDW Delaware, Inc. Magnetic cleaning pig. 5,461,746, Cl. 15-104.061.

Banno, Kouji: *See—*

Nagami, Tetsuo; Ogura, Yoshitsugu; Ogai, Masahiko; Fukushima, Yoshiaki; Inagaki, Shinji; Fukumoto, Kazuhiro; Banno, Kouji; Sakakibara, Yuji; Takada, Yasuo; Ohta, Takashi; Okada, Akane; Yamada, Yukimura; Hayashi, Kiyotaka; Matsuura, Shinji; and Kuroda, Kaz, 5,462,905, Cl. 502-232.000.

Barcaskey, Eric S., to TRW Inc. Gas generator for vehicle occupant restraint. 5,462,306, Cl. 280-736.000.

Barger, Paul T.: *See—*

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Pritchard, Francis E.; Koederitz, Eugene H.; Fuhrhop, Ronald E.; and Barker, Thomas H., Jr., 5,462,429, Cl. 431-3.000.

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Barney, Ward W.; and Smith, Steven L., to McGaw, Inc. Flexible, sterile container and method of making and using same. 5,462,526, Cl. 604-85.000.

Barnwell, Keith D., to Candea Inc. Self-venting straw tip. 5,462,194, Cl. 220-709.000.

Baron, Joseph. Circular-bladed pruning shears with holding action. 5,461,784, Cl. 30-135.000.

Barr, Morton L.: *See—*

Rech, Dawn M.; and Barr, Morton L., 5,462,736, Cl. 424-401.000.

Barr, Stephen M.; and Rohlf, Paul A., to Syntex (U.S.A.) Inc. Cell culture vial. 5,462,875, Cl. 435-289.100.

Barredo, Jose L.: *See—*

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Barry, Gerard F.; and Kishore, Ganesh M., to Monsanto Company. Glyphosate tolerant plants. 5,463,175, Cl. 800-205.000.

Barth, Francis; Casellas, Pierre; Congy, Christian; Martinez, Serge; and Rinaldi, Murielle, to Sanofi. Pyrazole-3-carboxamide derivatives, process for their preparation and pharmaceutical compositions in which they are present. 5,462,960, Cl. 514-406.000.

Bartlow, David H.; and Cannan, Edward B., Jr., to Fluid Containment, Inc. Double-walled underground storage tank. 5,462,191, Cl. 220-469.000.

Barton, Derek H. R.; Parekh, Shyamal I.; Taylor, Dennis K.; and Tse, Chi-lam, to Quest International B.V. Preparation of ambrox. 5,463,089, Cl. 549-458.000.

Barton, James C.: *See—*

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Barve, Shirish S.: *See—*

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BASF Aktiengesellschaft: *See—*

  - Becker, Rainer; Huellmann, Michael; Palm, Christof; and Franzischka, Wolfgang, 5,463,020, Cl. 528-408.000.
  - Penzel, Erich; Franzmann, Gernot; Angel, Maximilian; Pakusch, Joachim; and Schuler, Bernhard, 5,462,978, Cl. 523-342.000.
  - Pinkos, Rolf; and Fischer, Rolf, 5,463,079, Cl. 548-543.000.
  - Witzel, Tom; Fuchs, Eberhard; and Zimmermann, Horst, 5,463,130, Cl. 564-490.000.
- BASF Magnetics GmbH: *See—*
  - Hagemeyer, Alfred; Schildberg, Hans-Peter; Hibst, Hartmut; Baeuerle, Dieter; and Heitz, Johannes, 5,462,701, Cl. 264-482.000.
  - Keller, Harald; Jaeger, Ulrich; Steininger, Helmut; Kopke, Helmut; Schomann, Klaus D.; and Schildberg, Hans-Peter, 5,462,810, Cl. 428-694.00T.
- Bash, Stephan R.; Di Rubbo, Salvatore R. L.; Gibilisco, Paul F.; and Mansdoerfer, Richard L., Jr., to AT&T Corp. Method and apparatus for facilitating the making of collect calls. 5,463,677, Cl. 379-88.000.
- Basta, William C.: *See—*
  - Punola, David C.; Basta, William C.; and Smith, Jeffery S., 5,462,013, Cl. 118-719.000.
- Bastioli, Catia; Bellotti, Vittorio; Del Tredici, Gianfranco; Montino, Alessandro; and Ponti, Roberto, to Novamont S.p.A. Film-forming, starchy, polymeric composition and shaped articles, particularly films and sheets, which can be produced from the composition and have a good barrier effect, and a method of producing the articles. 5,462,980, Cl. 524-47.000.
- Bastioli, Catia; Bellotti, Vittorio; Del Tredici, Gianfranco; and Ponti, Roberto, to Novamont S.p.A. Method of producing plasticized polyvinyl alcohol and its use for the preparation of starch-based, biodegradable thermoplastic compositions. 5,462,981, Cl. 524-47.000.
- Bastioli, Catia; Lombi, Roberto; Del Tredici, Gianfranco; and Guanella, Italo, to Novamont S.p.A. Method for the preparation of destructured-starch-based compositions and compositions produced thereby. 5,462,982, Cl. 524-47.000.
- Batal, David J.; and Madison, Stephen A., to Lever Brothers Company, Division of Conopco, Inc. Sulfonimines as bleach catalysts. 5,463,115, Cl. 562-430.000.
- Battelle Memorial Institute: *See—*
  - Henager, Charles H., Jr.; and Hirth, John P., 5,462,902, Cl. 501-92.000.
- Batten, Ronald W. Tool holder with ejection slot. 5,461,947, Cl. 81-56.000.
- Battle, Mark, to George Ingraham Corp., The. Flexible multi-duct conduit assembly. 5,463,187, Cl. 174-88.00R.
- Bauer, Heinz, to Dylec Ltd. Status-reporting device for reporting a predetermined temperature state, temperature sensor suitable for such a status-reporting device, and process for the production of such a temperature sensor. 5,463,375, Cl. 340-517.000.
- Bauer, Jürgen, to Suspa Compart Aktiengesellschaft. Longitudinally adjustable column for chairs, tables or the like. 5,462,248, Cl. 248-161.000.
- Bauer, Klaus: *See—*
  - Ort, Oswald; Bauer, Klaus; and Bieringer, Hermann, 5,463,081, Cl. 549-13.000.
- Baum, Thomas H.; Mukherjee, Shyama P.; O'Toole, Terrence R.; Tai, Alice F.; and Viehbeck, Alfred, to International Business Machines Corporation. Method for forming a thin film layer. 5,462,897, Cl. 437-230.000.
- Baumann, Edgar; Obermeier, Wolfgang; and Werner, Karl, to Boehringer Mannheim GmbH. Light source pulsed with irregular pulse sequence in analog photometric signal evaluation for a test carrier analysis system. 5,463,467, Cl. 356-446.000.
- Baumann, Helmut: *See—*
  - Marek, Jiri; Schubert, Dietrich; Baumann, Helmut; Muenzel, Horst; Offenberg, Michael; and Willmann, Martin, 5,461,917, Cl. 73-514.160.
- Baumann, Stephen J., to Krueger International, Inc. Adjustable arm control. 5,462,338, Cl. 297-411.370.
- Baumlin, Jean-Marie: *See—*
  - Servant, Jeanne D.; and Baumlin, Jean-Marie, 5,462,598, Cl. 118-324.000.
- Baus, Rüdiger; and Linge, Reiner, to Firma Wegmann & Co. GmbH. Combat vehicle and system for transporting it for loading onto aircraft. 5,461,961, Cl. 89-1.815.
- Baxter International Inc.: *See—*
  - Chapman, Arthur S., 5,462,417, Cl. 417-477.700.
  - Dennehey, T. Michael; Brown, Richard I.; and Williamson, Warren P., 5,462,416, Cl. 417-477.200.
- Bayer Aktiengesellschaft: *See—*
  - Fischer, Reiner; Bretschneider, Thomas; Krüger, Bernd-Wieland; Erdelen, Christoph; Santel, Hans-Joachim; Lürssen, Klaus; Schmidt, Robert R.; Wachendorff-Neumann, Ulrike; and Stendel, Wilhelm, 5,462,913, Cl. 504-138.000.
  - Hagedorn, Ferdinand; Fiege, Helmut; and Traenckner, Hans-Joachim, 5,463,068, Cl. 548-152.000.
  - Jäger, Horst; Stöhr, Frank-Michael; and Schündehütte, Karl K. , 5,463,031, Cl. 534-618.000.
  - Lui, Norbert; Marhold, Albrecht; and Gassen, Karl-Rudolf, 5,463,088, Cl. 549-362.000.
  - Lui, Norbert; Marhold, Albrecht; and Bielefeldt, Dietmar, 5,463,150, Cl. 570-157.000.
  - Müller, Klaus-Helmut, 5,463,138, Cl. 568-655.000.
  - Podszun, Wolfgang; Bloodworth, Robert; and Oppermann, Günter, 5,462,687, Cl. 252-79.000.
  - Rivadeneira, Eric; and Jelich, Klaus, 5,463,065, Cl. 546-304.000.
  - Rohr, Jürgen; Riegels, Martin; and Lohmann, Sylvia, 5,462,565, Cl. 8-531.000.
  - Schön, Norbert; Rechner, Johann; Wagner, Paul; Buysch, Hans-Josef; Gasche, Hans-Erich; and Leiberich, Ricarda, 5,463,102, Cl. 558-274.000.
  - Scherkenbeck, Jürgen; Himmler, Thomas; Böhm, Stefan; Hagemann, Hermann; Stroech, Klaus; Dutzmann, Stefan; Dehne, Heinz-Wilhelm; and Hänssler, Gerd, 5,462,955, Cl. 514-383.000.
  - Schohe, Rudolf; Glaser, Thomas; Traber, Jörg; and Allen, George S., 5,463,105, Cl. 560-29.000.
  - Seitz, Thomas; Klausener, Alexander; Berg, Dieter; Wachendorff-Neumann, Ulrike; Erdelen, Christoph; Hänssler, Gerd; Brandes, Wilhelm; and Dutzmann, Stefan, 5,462,943, Cl. 514-256.000.
  - Springer, Wolfgang; Rast, Hans G.; Löbberding, Antonius; and Kanne, Reinhard, 5,462,855, Cl. 435-6.000.
- Bayer Corporation: *See—*
  - Markusch, Peter H.; and Rosthauser, James W., 5,462,766, Cl. 427-244.000.
- Bayer Pharma: *See—*
  - Bischoff, Erwin; Gao, Zhan; Wohlfeil, Stefan; Hecker, Gabriele; Cleophax, Jeannine; Dubreuil, Didier; Gero, Stéphane; Olesker, Alice; Verre-Sebrie, Catherine; Vieira de Almeida, Mauro; and Vass, Georges, 5,463,087, Cl. 549-336.000.
- Bazany, Donald J.: *See—*
  - Zink, Robert M.; Bazany, Donald J.; and Tramper, Douglas E., 5,462,221, Cl. 229-117.160.
- Beale, William T.; Lane, Neill W.; and McEntee, Jarlath, to Sunpower, Inc. Centering system with one way valve for free piston machine. 5,461,859, Cl. 60-517.000.
- Beam, Jeffrey, to Thompson International. Method of forming a composite vehicular wheel assembly. 5,461,779, Cl. 29-894.381.
- Beardsley, Brent C.: *See—*
  - Benhase, Michael T.; Beardsley, Brent C.; Sherman, William G., II; and Yanes, Adalberto G., 5,463,752, Cl. 395-481.000.
- Beart, Philip M.: *See—*
  - Roba, Joseph L.; Gillet, Claude L.; Rafferty, Michael F.; Jarrott, Bevyn; and Beart, Philip M., 5,462,965, Cl. 514-443.000.
- Beaty, Keith D., to Implant Innovations, Inc. Method and means for affixing a component to a dental implant. 5,462,436, Cl. 433-141.000.
- Beausoleil, William F.; Berghorn, Charles R.; Hupcey, John A.; and Schlosser, Sandra J., to International Business Machines Corporation. Shared direct access storage device for fixed block architecture devices. 5,463,754, Cl. 395-200.080.
- Beauvais, Randall, to Life Forece Associates, LP. Child safety seat. 5,462,333, Cl. 297-216.110.
- Beck, David H., to CertainTeed Corporation. Reinforced exterior siding. 5,461,839, Cl. 52-519.000.
- Becker, Erich; and Riedlinger, Heinz, to KNF Neuberger GmbH. Measuring gas pump. 5,461,966, Cl. 92-1.000.
- Becker, Jack J.: *See—*
  - Birli, Joseph A.; and Becker, Jack J., 5,463,693, Cl. 381-75.000.
- Becker, Rainer; Huellmann, Michael; Palm, Christof; and Franzischka, Wolfgang, to BASF Aktiengesellschaft. Preparation of polytetrahydrofuran or tetrahydrofuran/alkylene oxide copolymers. 5,463,020, Cl. 528-408.000.
- Becker, Richard A.; Clark, Linda A.; and Lambert, Diane, to AT&T IPM Corp. Method of displaying multiple time series and display generated thereby. 5,462,438, Cl. 434-430.000.
- Beckman Instruments, Inc.: *See—*
  - Coassin, Peter J.; Konrad, Kenneth D.; Rampal, Jang B.; and Cook, Ronald M., 5,462,854, Cl. 435-6.000.
  - Shieh, Chia-Hui, 5,462,646, Cl. 204-180.100.
- Beckwith, Robert W., to Sencorp Systems, Inc. Apparatus for non-mechanical die lip temperature adjustment in an extruder. 5,462,423, Cl. 425-141.000.
- Becton, Dickinson and Company: *See—*
  - Daugherty, Charles W., 5,462,533, Cl. 604-164.000.
- Beerens, Thomas. Roller nose chain saw guide bar. 5,461,789, Cl. 30-384.000.
- Beernink, Ernest H.; Pagallo, Giulia; and Bozinovic, Radmilo, to Apple Computer, Inc. Recognition system and method for user inputs to a computer system. 5,463,696, Cl. 382-186.000.
- Be'ery Yair: *See—*
  - Wertheizer, Gideon; Be'ery Yair; Ovadia, Bat-Sheva; Gross, Yael; Perets, Ronen; and Milstein, Yakov, 5,463,749, Cl. 395-437.000.
- Beeson, Karl W.; Zimmerman, Scott M.; Ferm, Paul M.; and McFarland, Michael J., to AlliedSignal Inc. Process for making an array of tapered photopolymerized waveguides. 5,462,700, Cl. 264-1.270.
- Behl, Wishvender K.: *See—*
  - Plichta, Edward J.; and Behl, Wishvender K., 5,462,818, Cl. 429-104.000.
- Belden & Blake Corporation: *See—*
  - Belden, Steven V.; Belden, Dennis D., Jr.; and Corp, John G., 5,462,115, Cl. 166-177.300.
- Belden, Dennis D., Jr.: *See—*
  - Belden, Steven V.; Belden, Dennis D., Jr.; and Corp, John G., 5,462,115, Cl. 166-177.300.
- Belden, Steven V.; Belden, Dennis D., Jr.; and Corp, John G., to Belden & Blake Corporation. Gas and oil well swab. 5,462,115, Cl. 166-177.300.
- Bell Communications Research, Inc.: *See—*
  - Fisher, Gregory M.; Cebulka, Kathleen D.; Man, Susan K.; Nazif, Zaher A.; and Vinciguerra, Lori J., 5,463,682, Cl. 379-201.000.
- Bell, Eric L.: *See—*

Kuromoto, Traci Y.; Bell, Eric L.; McDugle, Woodrow G.; Eachus, Raymond S.; Puckett, Sherrill A.; Olm, Myra T.; and Wilson, Robert D., 5,462,849, Cl. 430-567.000.

Bell Helicopter Textron Inc.: *See—*

Collins, Bobby A.; Grimes, Glenn R.; and Reddy, Dharam J., 5,462,242, Cl. 244-108.000.

Rogers, Charles W.; Crane, David A.; and Rai, Habib G., 5,462,618, Cl. 156-161.000.

Bell, James S.; and Swamy, Deepak, to Dell USA, L.P. Circuit board having an improved fine pitch ball grid array and method of assembly therefor. 5,463,191, Cl. 174-263.000.

Bellotti, Vittorio: *See—*

Bastioli, Catia; Bellotti, Vittorio; Del Tredici, Gianfranco; Montino, Alessandro; and Ponti, Roberto, 5,462,980, Cl. 524-47.000.

Bastioli, Catia; Bellotti, Vittorio; Del Tredici, Gianfranco; and Ponti, Roberto, 5,462,981, Cl. 524-47.000.

Benck, Jean; and Mailliet, Pierre, to Paul Wurth S.A. Device for blowing preheated air into a shaft furnace. 5,462,433, Cl. 432-99.000.

Bender, David L.; Bryan, William C.; Brugman, William; Carlson, Laurence; and Fox, Charles E., to Bandag Licensing Corporation. Tire bonding systems. 5,462,617, Cl. 156-96.000.

Bendix Espana S.A.: *See—*

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Benesi, Steve C. Filter apparatus belt filter medium control and treatment. 5,462,677, Cl. 210-791.000.

Benford, Howard L.; and Leising, Maurice B., to Chrysler Corporation. Automatic transmission with adaptive shift schedule. 5,462,500, Cl. 477-154.000.

Benhase, Michael T.; Beardsley, Brent C.; Sherman, William G., II; and Yanes, Adalberto G., to International Business Machines Corporation. Method and system for enhancing the efficiency of communication between multiple direct access storage devices and a storage system controller. 5,463,752, Cl. 395-481.000.

Benjamin, Michael H.; Bobick, Aaron F.; Koselka, Harvey A.; and Ulrich, W. Thatcher, to CyberGear, Inc. Interactive exercise apparatus. 5,462,503, Cl. 482-4.000.

Benjamin, Stanley. Retro-fit filter unit for air intakes to electro-mechanical machines. 5,462,569, Cl. 55-385.600.

Bennett, Emeric S. Method and apparatus for a weapon firing safety system. 5,461,812, Cl. 42-70.110.

Benninger, Keith G. Cab window security device. 5,462,323, Cl. 292-292.000.

Bentsen, James G., to Minnesota Mining and Manufacturing Company. Method of sensing with emission quenching sensors. 5,462,879, Cl. 436-136.000.

Beppu, Osamu: *See—*

Nakano, Masaaki; Inoue, Tomoaki; Amano, Hideaki; Takatsuka, Akio; Beppu, Osamu; Mori, Kenji; Yoshida, Takashi; and Kohno, Takashi, 5,463,511, Cl. 360-99.080.

Beretta, Robert K.; and Quintana, Jason M., to Hewlett-Packard Company. Indexing planetary gear train for a printer. 5,462,371, Cl. 400-569.000.

Berezansky, Alex. Portable door lock. 5,462,322, Cl. 292-288.000.

Berg, Dieter: *See—*

Seitz, Thomas; Klausener, Alexander; Berg, Dieter; Wachendorff-Neumann, Ulrike; Erdelen, Christoph; Hänssler, Gerd; Brandes, Wilhelm; and Dutzmann, Stefan, 5,462,943, Cl. 514-256.000.

Berg, Thomas R.: *See—*

Sarnicki, John T.; and Berg, Thomas R., 5,461,986, Cl. 105-165.000.

Bergeron, Raymond J., Jr.; and Sninsky, Charles A., to University of Florida Research Foundation, Inc. Polyamines and anti-diarrheal and gastrointestinal anti-spasmodic pharmaceutical compositions and methods of treatment. 5,462,970, Cl. 514-654.000.

Berghorn, Charles R.: *See—*

Beausoleil, William F.; Berghorn, Charles R.; Hupcey, John A.; and Schlosser, Sandra J., 5,463,754, Cl. 395-200.080.

Berglund, Kris A.; Dulebohn, Joel I.; and Torgerson, Beatrice A., to Board of Trustees operating Michigan State University. Method for determining hydroxy aromatic compounds. 5,462,878, Cl. 436-131.000.

Bergmans, Johannes W. M., to U.S. Philips Corporation. Transmission system with increased sampling rate detection. 5,463,654, Cl. 375-341.000.

Bergquist Company, The: *See—*

DeGree, David C., 5,463,530, Cl. 361-707.000.

Bergthaller, Peter, to Agfa Gevart AG, D-51368. Process for the preparation of naphtholic 2-equivalent cyan couplers. 5,463,072, Cl. 548-255.000.

Bergvist, Anders; and Dahllof, Hakan, to Kamyr Atkiebolag. Process for bleaching pulp with adsorption of metals. 5,462,641, Cl. 162-40.000.

Berkcan, Ertugrul, to General Electric Company. Reduced magnetic field line integral current sensor. 5,463,313, Cl. 324-117.00R.

Berkcan, Ertugrul, to General Electric Company. Optical sensor for duct fan discharge mach numbers. 5,463,458, Cl. 356-28.000.

Berkowitz, Ami, to University of California, The Regents of the. Giant magnetoresistant single film alloys. 5,462,809, Cl. 428-546.000.

Berntsen, James L.: *See—*

Scudder, James A.; and Berntsen, James L., 5,461,867, Cl. 62-4.000.

Berry, Arnold J., to Emory University. Holder for sharp medical instruments with individual angularly presented encasements. 5,462,163, Cl. 206-370.000.

Berry, James E.; Pace, Gary L.; Herold, Barry W.; McLaughlin, Kevin; and Graham-Meighan, Margaret, to Motorola, Inc. Apparatus for detecting completion of energy transfer in an inductive DC to DC converter. 5,463,306, Cl. 323-222.000.

Berry, William W., to Coralplex, Inc. Aqueous hydrides and method of manufacture therefore. 5,462,723, Cl. 423-347.000.

Bersier, Jacques: *See—*

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Bertin & Cie: *See—*

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Bertram, Paul: *See—*

Stevens-Wright, Debbie; Russo, Massimo; Nielsen, Peter; and Bertram, Paul, 5,462,527, Cl. 604-95.000.

Best, Christopher H., to Lucas Industries Public Limited Company. Fuel pumping apparatus. 5,462,033, Cl. 123-502.000.

Best, Jim E.; and Smith, Donald A., to Canadian Fracmaster Ltd. Method and apparatus for erosive stimulation of open hole formations. 5,462,129, Cl. 175-67.000.

Beste, Randal T.: *See—*

Chesnutt, Dennis P.; and Beste, Randal T., 5,463,319, Cl. 324-339.000.

Betta, Ralph D.; Shoji, Toru; and Tanaka, Seiichiro, to Catalytica, Inc.; and Tanaka Kikinzoku Kogyo K.K. Cooled support structure for a catalyst. 5,461,864, Cl. 60-723.000.

Beyer, Gerhard; Sulzbach, Reinhard; Wess, Eduard; and Hengel, Rolf, to Hoechst Aktiengesellschaft. Process for working up aqueous dispersions of fluorinated thermoplastic. 5,463,021, Cl. 528-482.000.

Bhatia, Ashok V.: *See—*

Riley, David A.; Chamberlin, Steven A.; and Bhatia, Ashok V., 5,463,142, Cl. 568-833.000.

Bhatia, Rajkumar P.: *See—*

Schlitzer, Ronald L.; Dassanayake, N. L.; and Bhatia, Rajkumar P., 5,462,713, Cl. 422-37.000.

Bhatta, Krishna M. Treatment of symptomatic benign prostatic hyperplasia. 5,462,753, Cl. 424-670.000.

Bhattacharya, Dipankar: *See—*

Ghosh, Subir K.; and Bhattacharya, Dipankar, 5,463,759, Cl. 395-461.000.

Bhattacharya, Raghu N.; and Ginley, David S., to Midwest Research Institute. Preparation of lead-zirconium-titanium film and powder by electrodeposition. 5,462,647, Cl. 205-74.000.

Bialkowski, Jan; and Krawczyk, John, to Wellfleet Communications. System for segmenting data packets to form binary decision trees which determine filter masks combined to filter the packets for forwarding. 5,463,777, Cl. 395-600.000.

Bianchi, Emilio, to Ceute S.A. Device for connecting blades to a hub. 5,462,411, Cl. 416-202.000.

Bidese, Werner; Fritschi, Hans-Rudolf; and Grau, Alfred, to Siemens-Albis AG. Switching arrangement for activating electrical devices. 5,463,680, Cl. 379-165.000.

Bielefeldt, Dietmar: *See—*

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Bieringer, Hermann: *See—*

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Biftu, Tesfaye; Cai, Xiong; Hussion, Sajjet; Grewal, Gurmit; and Shen, T. Y., to Cytomed, Inc. Compounds and methods for the treatment of cardiovascular, inflammatory and immune disorders. 5,463,083, Cl. 549-71.000.

Bignotti, Fabio: *See—*

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Bilco Tools, Inc.: *See—*

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Billings, Phillip A.: *See—*

Mandel, Barry P.; Resto, Suzzette S.; Rizzolo, Charles D.; Green, Frederick A.; Van Dongen, Richard A.; and Billings, Phillip A., 5,462,265, Cl. 270-53.000.

Biomeasure, Inc.: *See—*

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Birli, Joseph A.; and Becker, Jack J., to Audiopack Sound Systems Inc. Voice amplification adapter assembly for face mask. 5,463,693, Cl. 381-75.000.

Birss, Viola I.: *See—*

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Bischoff, Erwin; Gao, Zhan; Wohlfeil, Stefan; Hecker, Gabriele; Cleophax, Jeannine; Dubreuil, Didier; Gero, Stéphane; Olesker, Alice; Verre-Sebrie, Catherine; Vieira de Almeida, Mauro; and Vass, Georges, to Bayer Pharma. Substituted derivatives of deoxymyoinositol, process for their preparation and their use in medicaments. 5,463,087, Cl. 549-336.000.

Bissett, Donald L.: *See—*

Bush, Rodney D.; and Bissett, Donald L., 5,462,963, Cl. 514-248.000.

Bizerba-Werke Wilhelm Kraut GmbH & Co. KG: *See—*

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Bizley, Arthur J.: *See—*

  - Calder, Douglas W.; and Bizley, Arthur J., 5,463,333, Cl. 327-78.000.
  - Calder, Douglas W.; and Bizley, Arthur J., 5,463,354, Cl. 331-65.000.
- BKL, Inc.: *See—*
  - Sanderson, Stephen J., 5,463,283, Cl. 315-209.00R.
- Black & Decker Inc.: *See—*
  - Strong, David S.; Rosa, Richard P.; and Burnett, Brian S., 5,461,847, Cl. 56-16.700.
- Black, Gary: *See—*
  - Bowen, Larry; Ayres, George E.; Black, Gary; and Daoust, Jacques, 5,462,073, Cl. 131-374.000.
- Blackbourn, Robert L.; Allan, Edgar D.; Le, Loc B.; and Patel, Snehal, to Shell Oil Company. Cumene hydroperoxide cleavage process. 5,463,136, Cl. 568-385.000.
- Blagaila, John: *See—*
  - Morehouse, James H.; Furay, David M.; Blagaila, John; Dion, F. Eugene; Shelstad, Scott A.; and Woods, Jimmy L., 5,463,507, Cl. 360-97.020.
- Blahut, Donald E.; and Szurkowski, Edward S., to AT&T Corp. Electronic circuits for the graphical display of overlapping windows with transparency. 5,463,728, Cl. 395-158.000.
- Blair, Rodney L.; and Chauvet, Philip G. Portable inflatable structure. 5,462,505, Cl. 482-27.000.
- Blank, Alon: *See—*
  - Blank, Izhak; and Blank, Alon, 5,462,728, Cl. 424-49.000.
- Blank, Izhak; and Blank, Alon. Pharmaceutical compositions. 5,462,728, Cl. 424-49.000.
- Blasczyk, Gotthard: *See—*
  - Patzelt, Norbert; Blasczyk, Gotthard; and Eickholt, Hubert, 5,462,234, Cl. 241-19.000.
- Bloembergen, Steven; and Narayan, Ramani, to Evercorn, Inc. Biodegradable moldable products and films comprising blends of starch esters and polyesters. 5,462,983, Cl. 524-51.000.
- Blomquist, Randall J.: *See—*
  - Smith, Donald K.; Haddix, Stephen J.; and Blomquist, Randall J., 5,462,238, Cl. 241-243.000.
- Bloodworth, Robert: *See—*
  - Podszun, Wolfgang; Bloodworth, Robert; and Oppermann, Günter, 5,462,687, Cl. 252-79.000.
- Board of Regents, The University of Texas System: *See—*
  - Hubbell, Jeffrey A.; Elbert, Donald; Hill-West, Jennifer L.; Drumheller, Paul D.; Chowdhury, Sanghamitra; and Sawhney, Amarpreet, 5,462,990, Cl. 525-54.100.
- Board of Trustees operating Michigan State University: *See—*
  - Berglund, Kris A.; Dulebohn, Joel I.; and Torgerson, Beatrice A., 5,462,878, Cl. 436-131.000.
  - Pinnavaia, Thomas J.; Perez-Bernal, Elena M.; Ruarno-Casero, Ricardo; and Chibwe, Malama, 5,463,042, Cl. 540-139.000.
- Bobb, Lloyd C.; and Krumboltz, Howard D., to United States of America, Navy. Single-ended optical fiber strain sensor for measuring maximum strain. 5,461,926, Cl. 73-800.000.
- Bobb, Lloyd C.; and Krumboltz, Howard D., to United States of America, Navy. Optical fiber strain sensor for measuring maximum strain. 5,461,927, Cl. 73-800.000.
- Bobick, Aaron F.: *See—*
  - Benjamin, Michael H.; Bobick, Aaron F.; Koselka, Harvey A.; and Ulrich, W. Thatcher, 5,462,503, Cl. 482-4.000.
- BOC Group, Inc., The: *See—*
  - Mostello, Robert A., 5,461,872, Cl. 62-24.000.
  - Ramachandran, Ramakrishnan; and Dao, Loc H., 5,463,137, Cl. 568-454.000.
- BOC Group plc, The: *See—*
  - Wardle, David G., 5,462,111, Cl. 165-104.140.
- Boden, John T.: *See—*
  - Portelli, Gene B.; Schultz, William J.; Boden, John T.; and Kaufer, Daniel M., 5,462,996, Cl. 525-423.000.
- Bodine, Daryl L. Water hose cart. 5,462,298, Cl. 280-47.340.
- Boeck, Edgar L., II. Sealing closure clip for gable top container. 5,462,222, Cl. 229-125.390.
- Boehringer Ingelheim KG: *See—*
  - Gupte, Arun R.; Rohr, Uwe; and Zierenberg, Bernd, 5,462,744, Cl. 424-448.000.
- Boehringer Mannheim GmbH: *See—*
  - Baumann, Edgar; Obermeier, Wolfgang; and Werner, Karl, 5,463,467, Cl. 356-446.000.
  - Krause, Friedemann, 5,463,228, Cl. 250-577.000.
- Boeing Company, The: *See—*
  - Garrigus, Darryl F., 5,462,009, Cl. 117-7.000.
  - Murphy, Timothy A., 5,463,317, Cl. 324-520.000.
  - Sheppard, Clyde H.; and Lubowitz, Hyman R., 5,463,076, Cl. 548-431.000.
- Boelsterli, Urs: *See—*
  - Stehr, Roger; and Boelsterli, Urs, 5,462,420, Cl. 418-83.000.
- Boen, Charles G.; Hadank, John M.; McGuire, Kenneth J.; Schricker, David R.; and Scholl, Rolland D., to Caterpillar Inc. Apparatus and method for providing historical data regarding machine operating parameters. 5,463,567, Cl. 364-551.010.
- Bogentoft, Conny; Carlsson, Anders; and Tomlin, Janet, to Pharmacia AB. Gel-forming liquid dietary fibre composition. 5,462,742, Cl. 424-439.000.
- Boggs, Darrell D.: *See—*
  - Vidwans, Rohit A.; Boggs, Darrell D.; Fetterman, Michael A.; and Glew, Andrew F., 5,463,745, Cl. 395-375.000.
- Bogle, Tom G.; Tuma, John E.; and Williams, Barry N., to Tanknology Corporation International. Apparatus for confirming the presence of a leak in a liquid storage tank. 5,461,906, Cl. 73-49.200.
- Böhm, Stefan: *See—*
  - Scherkenbeck, Jürgen; Himmler, Thomas; Böhm, Stefan; Hagemann, Hermann; Stroech, Klaus; Dutzmann, Stefan; Dehne, Heinz-Wilhelm; and Hänssler, Gerd, 5,462,955, Cl. 514-383.000.
- Bohn, Roy W. Blade sharpening device. 5,462,476, Cl. 451-558.000.
- Boie, Robert A.; Ruedisueli, Laurence W.; and Wagner, Eric R., to AT&T IPM Corp. Computer mouse or keyboard input device utilizing capacitive sensors. 5,463,388, Cl. 341-33.000.
- Boije, Anna M. P.: *See—*
  - Svensson, Kjell A. I.; Wikstrom, Hakan V.; Carlsson, Per A. E.; Boije, Anna M. P.; Waters, R. Nicholas; Sonesson, Clas A.; Stjernlof, Nils P.; Andersson, Bengt R.; and Hansson, Lars O., 5,462,947, Cl. 514-317.000.
- Boiret, Gérard; and Quillet, Thierry, to Framatome Connectors International. Electrical connector having an insertion and extraction bracket. 5,462,447, Cl. 439-347.000.
- Boisrobert, Christine E.: *See—*
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- Bokor, Anton, to Western Wire Works, Inc. Screen lining. 5,462,175, Cl. 209-399.000.
- Bolanos, Henry; Sater, Ghaleb A.; DeFonzo, Stephan A.; and Young, Wayne P., to United States Surgical Corporation. Umbilical cord clip and applicator. 5,462,555, Cl. 606-120.000.
- Bolanos, Henry: *See—*
  - Kolesa, Michael S.; Mastri, Dominick L.; Young, Wayne P.; and Bolanos, Henry, 5,462,558, Cl. 606-139.000.
  - Viola, Frank J.; Green, David T.; and Bolanos, Henry, 5,462,215, Cl. 227-176.000.
- Bolton, Theodore S.; and Michaels, John H., to Carrier Corporation. Air conditioner condensate slinger. 5,461,879, Cl. 62-280.000.
- Bolton, Theodore S.; and Stopyra, Stephen, to Carrier Corporation. Snap together control box for air conditioner. 5,461,880, Cl. 62-298.000.
- Bolz, Hans-Peter: *See—*
  - Adams, Samuel F.; and Bolz, Hans-Peter, 5,461,889, Cl. 68-189.000.
- Bonadeo, Daniele: *See—*
  - Stroppolo, Federico; Bonadeo, Daniele; and Gazzaniga, Annibale, 5,463,117, Cl. 562-496.000.
- Bonduel, Pascal: *See—*
  - Heckel, Robert J.; Fin, Enrico; Gier, Achim R.; and Bonduel, Pascal, 5,461,826, Cl. 49-28.000.
- Bone, Roger F.: *See—*
  - Agrafiotis, Dimitris K.; Bone, Roger F.; Salemme, Francis R.; and Soll, Richard M., 5,463,564, Cl. 364-496.000.
- Bonfils, Michel R.: *See—*
  - Aubry, Jacques A.; and Bonfils, Michel R., 5,462,137, Cl. 188-72.600.
- Bonner, Stephen D.; Rosthal, Richard A.; Bagersh, Abdullah A.; Luling, Martin G.; and Jundt, Jacques A., to Schlumberger Technology Corporation. Apparatus and method for determining the resitivity of underground formodions surrounding a borehole. 5,463,320, Cl. 324-366.000.
- Bonnet, Henri, to United Parcel Service of America, Inc. Method and apparatus for mechanical loading and unloading. 5,462,400, Cl. 414-796.500.
- Bonnichsen, Frits F.; and Jørgensen, Peter N., to Novo Nordisk A/S. Syringe system. 5,462,535, Cl. 604-272.000.
- Booher, Benjamin V., to Universal Design. Continuous pultrusion method of making friction units. 5,462,620, Cl. 156-180.000.
- Boon-Falleur, Thierry; van der Bruggen, Pierre; De Plaen, Etienne; Lurquin, Christophe; Traversari, Catia; Gaugler, Beatrice; and Van den Eynde, Benoit, to Ludwig Institute for Cancer Research. Isolated nucleic acid molecules which encode MAGE derived nonapeptides. 5,462,871, Cl. 435-240.200.
- Booy, Caroline; and Booy, Robert. Method for manufacturing tartshells. 5,462,757, Cl. 426-486.000.
- Booy, Robert: *See—*
  - Booy, Caroline; and Booy, Robert, 5,462,757, Cl. 426-486.000.
- Borden, Inc.: *See—*
  - Ventres, Romeo J.; Matuszak, Edward A.; and Merritt, Carleton G., 5,462,758, Cl. 426-557.000.
- Borg-Warner Automotive, Inc.: *See—*
  - Simpson, Roger T., 5,462,493, Cl. 474-111.000.
- Boriani, Silvano; and Minarelli, Alessandro, to G.D Societa' Per Azioni. Method and device for feeding portions of wrapping material to a packing line. 5,461,954, Cl. 83-49.000.
- Borland International, Inc.: *See—*
  - Anderson, Charles R.; Warfield, Robert W.; Cseri, Istvan; Low, Murray K.; Liaw, Weikuo; and Bush, Alan M., 5,463,724, Cl. 395-148.000.
- Born, Maurice; Aberkane, Ourida; Mieloszynski, Jean-Luc; Paquer, Daniel; and Parc, Guy, to Institut Francais du Petrole. Process for the preparation of phosphosulfide compounds useful as oil lubricants. 5,463,132, Cl. 568-22.000.
- Born, Maurice: *See—*
  - Delfort, Bruno; Daqudal, Bertrand; Lallement, Jacques; Born, Maurice; Marchand, Pierre; and Hipeaux, Jean-Claude, 5,462,682, Cl. 252-18.000.
- Boschelli, Diane H.; Connor, David T.; and Hoefle, Milton L., to Warner-Lambert Company. Fenamate 1,3,4-thiadiazoles and 1,3,4-oxadiazoles as antiinflammatory agents. 5,462,952, Cl. 514-364.000.

Bosley, Robert W.: *See—*
  Bakholdin, Daniel; Bosley, Robert W.; and Pearson, Chris C., 5,462,402, Cl. 415-90.000.
Bourgois, Luc: *See—*
  Bruyneel, Pol; and Bourgois, Luc, 5,461,850, Cl. 57-212.000.
Bowen, Larry; Ayres, George E.; Black, Gary; and Daoust, Jacques, to Rothmans, Benson & Hedges Inc. Cigarette having wrapper made by extraction and paper-making process. 5,462,073, Cl. 131-374.000.
Bowen, Mark A.; and Bowen, Mims, to Public Transportation Safety Devices Corp. Safety guard. 5,462,324, Cl. 293-15.000.
Bowen, Mims: *See—*
  Bowen, Mark A.; and Bowen, Mims, 5,462,324, Cl. 293-15.000.
Boyd, David W.: *See—*
  Sobol, Robert E.; Webb, Steven L.; and Boyd, David W., 5,463,217, Cl. 250-234.000.
Boyer, Lynn L., III. Missiles having means for marking targets destroyed by said missiles to prevent further expenditure of munitions to said target. 5,461,982, Cl. 102-513.000.
Bozinovic, Radmilo: *See—*
  Beemink, Ernest H.; Pagallo, Giulia; and Bozinovic, Radmilo, 5,463,696, Cl. 382-186.000.
Braatz, James A.; Kehr, Clifton L.; Grasel, Timothy G.; and Letter, William S., to Hampshire Chemical Corp. Protein nonadsorptive membranes for wound dressings. 5,462,536, Cl. 604-304.000.
Bracco International B.V.: *See—*
  Ogan, Marc; Tomasella, Frank P.; and Tu, Jan-I, 5,463,080, Cl. 548-545.000.
Bracque, Gilles; Dehaine, Francois; Gourbier, Jean-Pierre; Gourdain, Daniel; Grelaud, Alain; Guillard, Alain; and Mouliney, Michel, to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude. Installation for the distillation of air. 5,461,871, Cl. 62-24.000.
Bradford Company: *See—*
  Zink, Robert M.; Bazany, Donald J.; and Tramper, Douglas E., 5,462,221, Cl. 229-117.160.
Bradley, Gary W.: *See—*
  Arrington, Stephen T.; and Bradley, Gary W., 5,462,671, Cl. 210-717.000.
Bradley, Wayne H.; and Werner, Richard E., to Motorola. Gradient directional microphone system and method therefor. 5,463,694, Cl. 381-92.000.
Brandeis University: *See—*
  Perlman, Daniel, 5,462,881, Cl. 436-180.000.
Brandes, Wilhelm: *See—*
  Seitz, Thomas; Klausener, Alexander; Berg, Dieter; Wachendorff-Neumann, Ulrike; Erdelen, Christoph; Hänssler, Gerd; Brandes, Wilhelm; and Dutzmann, Stefan, 5,462,943, Cl. 514-256.000.
Brandt, Horst, to Glyco-Metall-Werke Glyco B.V. & Co. KG. Composite radial-axial plain bearing. 5,462,365, Cl. 384-294.000.
Braswell-Moore, Glenda M. Bouffant headpiece. 5,461,727, Cl. 2-171.000.
Brehmer, Hans-Heinrich: *See—*
  Hebisch, Heinz; Brehmer, Hans-Heinrich; Goltz, Norbert; and Rothenstein, Uwe, 5,463,169, Cl. 588-202.000.
Brenner, Gerald S.; Katdare, Ashok V.; Pretzer, Denise; and Whiteford, Donna T., to Merck & Co., Inc. Oral liquid alendronate formulations. 5,462,932, Cl. 514-108.000.
Bretschneider, Thomas: *See—*
  Fischer, Reiner; Bretschneider, Thomas; Krüger, Bernd-Wieland; Erdelen, Christoph; Santel, Hans-Joachim; Lürssen, Klaus; Schmidt, Robert R.; Wachendorff-Neumann, Ulrike; and Stendel, Wilhelm, 5,462,913, Cl. 504-138.000.
Brewster, Steven L.: *See—*
  Wehmeyer, Richard M.; Walters, Marlin E.; Tasset, Emmett L.; and Brewster, Steven L., 5,463,140, Cl. 568-727.000.
Bricker, Jeffery C.: *See—*
  Galperin, Leonid B.; Bricker, Jeffery C.; and Holmgren, Jennifer S., 5,463,155, Cl. 585-310.000.
Brico Engineering Limited: *See—*
  Baker, Andrew R.; and Kettle, Richard L., 5,462,573, Cl. 75-231.000.
Bridgestone Corporation: *See—*
  Horikawa, Yasuo; Takizawa, Toshiki; and Akazawa, Taro, 5,463,003, Cl. 526-176.000.
  Horikawa, Yasuo, 5,463,004, Cl. 526-176.000.
  Siegenthaler, Karl J., 5,462,104, Cl. 152-563.000.
Briggs, Richard W.; and Wu, Zhen, to University of Florida. Stable artifact-free imaging contrast suspension agent. 5,462,053, Cl. 128-653.400.
Bright, Stephen A., to Electra Form, Inc. Bottle base stand. 5,462,180, Cl. 215-12.100.
Brightman, Timothy H.; Gulick, Kenneth; Hanson, Robert L.; Herrick, Brian R.; Jeffery, Edwin A.; Kozo, Maria J.; and Swanson, Carl A., to Digital Equipment Corporation. Equipment cabinet stand. 5,462,350, Cl. 312-351.700.
Brinkman, Erik J. Scroller roller band device. 5,462,363, Cl. 384-91.000.
Bristol-Myers Squibb Company: *See—*
  Lodge, Nicholas J., 5,462,726, Cl. 514-558.000.
Bristow, Charles E., Jr. Reflecting animal ear tag. 5,461,806, Cl. 40-301.000.
British Biotech Pharmaceuticals Limited: *See—*
  Kingsman, Alan J.; Kingsman, Susan M.; Adams, Sally E.; Mellor, Elizabeth J. C.; and Malim, Michael H., 5,463,024, Cl. 530-350.000.
British Gas PLC: *See—*
  Gill, Michael J., 5,461,931, Cl. 73-861.280.
British Technology Group Limited: *See—*
  Britt, Adrian J.; Bruce, Neil C.; and Lowe, Christopher R., 5,462,868, Cl. 435-196.000.
Britt, Adrian J.; Bruce, Neil C.; and Lowe, Christopher R., to British Technology Group Limited. Cocaine esterase from Pseudomonas sp. NCIMB 40427 for detection of cocaine. 5,462,868, Cl. 435-196.000.
Brizzi, Marco; and Gamberini, Antonio, to G.D Societa' per Azioni. Packing line for producing twin packets. 5,461,842, Cl. 53-234.000.
Brizzi, Marco; and Gamberini, Antonio, to G. D Societa' Per Azioni. Method of separating two rows of cigarette packets. 5,462,401, Cl. 414-797.000.
Broad, Sherry A.: *See—*
  Hotton, Donald J.; and Broad, Sherry A., 5,461,764, Cl. 29-91.000.
Brocks, William. Men's underwear brief. 5,461,729, Cl. 2-403.000.
Brodnax, Timothy B.; Bullis, Bryan K.; King, Steven A.; Kogge, Peter M.; and Rickard, Dale A., to International Business Machines Corp. Data processing system having prediction by using an embedded guess bit of remapped and compressed opcodes. 5,463,746, Cl. 395-375.000.
Brody, Thomas P. Method for manufacturing laminated U V-sensitive color filters for liquid crystal displays. 5,463,484, Cl. 359-68.000.
Brogden, Kim A.; and Chedid, Louis, to United States of America, Agriculture. *Pasteurella haemolytica* subunit vaccine containing capsular polysaccharide and muramyl dipeptide. 5,462,735, Cl. 424-255.100.
Brois, Stanley J.; Patil, Abhimanyu O.; Schulz, Wolfgang W.; Hsu, Chang S.; and Garner, Richard T., to Exxon Research & Engineering Co. Free radical adducts of fullerenes with hydrocarbons and polymers. 5,462,680, Cl. 252-9.000.
Brooklyn Union Gas Co.: *See—*
  Cohen, John H.; Leitko, Curtis E.; Pittard, Gerard T.; Clifton, Terry P.; and Rockower, Gerald, 5,462,077, Cl. 137-15.000.
Brooks, Cecil B. Union peeling device. 5,461,971, Cl. 99-645.000.
Brooks, James R., to SpaceLabs Medical, Inc. Fast response low-pass filter. 5,463,346, Cl. 327-553.000.
Broome, Jeffrey: *See—*
  Filgas, David M.; McFadden, Gordon M.; Broome, Jeffrey; and York, James F., 5,463,710, Cl. 385-90.000.
Brother Kogyo Kabushiki Kaisha: *See—*
  Hirono, Kazuhisa, 5,462,372, Cl. 400-615.200.
  Watanabe, Makoto; Mochizuki, Isao; Sato, Yoshitsugu; Takagi, Takeyuki; and Okada, Hiroaki, 5,463,195, Cl. 200-5.00A.
Brown & Williamson Tobacco Corporation: *See—*
  Alday, Royce L., 5,462,290, Cl. 277-95.000.
  Hereford, Cliff E., deceased; and Malek, Joseph H., 5,462,176, Cl. 209-577.000.
Brown, David L., to United States Surgical Corporation. Method of using a needle shield device for surgical packages. 5,461,844, Cl. 53-449.000.
Brown, David L.: *See—*
  Kaplan, Donald S.; Hermes, Matthew E.; Muth, Ross R.; Brown, David L.; and Holzwarth, Henry A., 5,462,162, Cl. 206-339.000.
  Marko, Paul D.; Wadin, Craig P.; and Brown, David L., 5,463,351, Cl. 331-1.00A.
Brown, David M.; Gatter, Erich M.; and Littau, Cheryl A., to Hoechst Celanese Corporation. Solvent free quaternization of tertiary amines with dimethylsulfate. 5,463,094, Cl. 554-110.000.
Brown, George R.; and Shute, Richard E., to Zeneca Limited. Acid derivatives. 5,463,011, Cl. 528-44.000.
Brown, Larry L.: *See—*
  Lesko, Jon M.; Brown, Larry L.; and Keller, James A., 5,463,222, Cl. 250-330.000.
Brown, Louanne K.: *See—*
  Matthews, Mark D.; and Brown, Louanne K., 5,462,639, Cl. 156-662.100.
Brown, Quentin M. Folding camping/cargo trailer. 5,462,330, Cl. 296-172.000.
Brown, Richard I.: *See—*
  Dennehey, T. Michael; Brown, Richard I.; and Williamson, Warren P., 5,462,416, Cl. 417-477.200.
Brown, William L.: *See—*
  Moran, John L., III; Sridhar, Manickam R.; and Brown, William L., 5,463,661, Cl. 375-222.000.
Browne, Colin L.; and Robertson, Raymond M., to Hoechst Celanese Corporation. Removal of nicotine from tobacco smoke. 5,462,072, Cl. 131-334.000.
Bruce, Neil C.: *See—*
  Britt, Adrian J.; Bruce, Neil C.; and Lowe, Christopher R., 5,462,868, Cl. 435-196.000.
Brucker, Greg G.; Saul, Jerome P.; and Savage, Steven D., to Angeion Corporation. Fluid cooled and perfused tip for a catheter. 5,462,521, Cl. 604-20.000.
Bruemmer, Mary A.; Rosch, Paulette M.; Vukos, John P.; Uitenbroek, Duane G.; Zehner, Georgia L.; and Rasmussen, Christine A., to Kimberly-Clark Corporation. Pocket-like diaper or absorbent article. 5,462,541, Cl. 604-391.000.
Brugman, William: *See—*
  Bender, David L.; Bryan, William C.; Brugman, William; Carlson, Laurence; and Fox, Charles E., 5,462,617, Cl. 156-96.000.
Bruguera, Raimon Soler: *See—*
  Cortes Guasch, Esteve; and Bruguera, Raimon Soler, 5,461,964, Cl. 91-375.00R.
Bruinsma, Anastasius J. A.: *See—*
  Van Der Hoek, Marinus J.; Moor, Adolf H. K.; Bruinsma, Anastasius J. A.; Roos, Jaap; and Buisman, Jacobus C., 5,462,244, Cl. 246-122.00R.

Bruker Analytische Messtechnik GmbH: *See—*

Müller, Wolfgang, 5,463,364, Cl. 335-299.000.

Bruker-Franzen Analytik GmbH: *See—*

Holle, Armin, 5,463,218, Cl. 250-281.000.

Bruneau, Pierre A. R.; Crawley, Graham C.; and Oldham, Keith, to Imperial Chemical Industries PLC; and ICI Pharma. Benzoxazolyl derivatives useful as 5-lipoxygenase inhibitors. 5,462,953, Cl. 514-379.000.

Bruni AG Grafische Maschinen: *See—*

Bruni, Hanspeter, 5,461,979, Cl. 101-365.000.

Bruni, Hanspeter, to Bruni AG Grafische Maschinen. Multiple blade ink knife. 5,461,979, Cl. 101-365.000.

Brunswick Corporation: *See—*

Meisenburg, Gary L.; Eick, Edward C.; Magee, Phillip D.; Mixon, Charles M.; Weronke, Robert B.; Shields, Waylon D.; Smith, Woody R.; and Pavey, Steven J., 5,462,463, Cl. 440-80.000.

Schmidt, Keith W., 5,462,465, Cl. 440-111.000.

Bruyneel, Pol; and Bourgois, Luc, to N.V. Bekaert S.A. Multi-strand steel cord having a core and peripheral strands surrounding the core. 5,461,850, Cl. 57-212.000.

Bryan, William C.: *See—*

Bender, David L.; Bryan, William C.; Brugman, William; Carlson, Laurence; and Fox, Charles E., 5,462,617, Cl. 156-96.000.

Buchanan, Arnold: *See—*

Hodson, Price R.; Chu, Federico; Buchanan, Arnold; and Montividas, Robert E., 5,461,910, Cl. 73-170.120.

Bucher, Alan W.: *See—*

Randall, Richard D.; and Bucher, Alan W., 5,462,226, Cl. 236-93.00R.

Buchroeder, Richard A., to Orascoptic Research, Inc. Light-weight three-element clinical viewer. 5,463,500, Cl. 359-744.000.

Buchwalter, Stephen L.: *See—*

Viehbeck, Alfred; Goldberg, Martin; Tisdale, Stephen L.; Buchwalter, Stephen L.; Grebe, Kurt R.; Kovac, Caroline A.; and Matthew, Linda C., 5,462,628, Cl. 156-281.000.

Buck Werke GmbH & Co.: *See—*

Hebisch, Heinz; Brehmer, Hans-Heinrich; Goltz, Norbert; and Rothenstein, Uwe, 5,463,169, Cl. 588-202.000.

Buckingham, Mark R.: *See—*

Evans, Christopher M.; Buckingham, Mark R.; and Norman, Colin F., 5,462,823, Cl. 430-14.000.

Buckley, Paul, to Lucas Industries public limited company. Fuel pumping apparatus. 5,462,028, Cl. 123-447.000.

Buckley, Peter; Cousins, Lisa; Daynes, Todd; Gretxhev, Val; Hirasawa, Drake; and Leith, Graham, to MDS Health Group Limited. Mass spectrometer system and method using simultaneous mode detector and signal region flags. 5,463,219, Cl. 250-281.000.

Budd, Alexander G. Ambient air collection device for use with a self-contained breathing apparatus. 5,461,934, Cl. 73-864.520.

Buechel, Frederick F.: *See—*

Pappas, Michael J.; and Buechel, Frederick F., 5,462,548, Cl. 606-80.000.

Bühlmann, Ulrich: *See—*

Knöpfli, Bruno; and Bühlmann, Ulrich, 5,461,761, Cl. 29-6.100.

Bui, Loc V.: *See—*

Karandikar, B. M.; Bui, Loc V.; and Le, Hue P., 5,462,591, Cl. 106-20.00R.

Buisman, Jacobus C.: *See—*

Van Der Hoek, Marinus J.; Moor, Adolf H. K.; Bruinsma, Anastasius J. A.; Roos, Jaap; and Buisman, Jacobus C., 5,462,244, Cl. 246-122.00R.

Bulkeley, Guy V. O. Motorcycle control lever connector. 5,461,936, Cl. 74-489.000.

Bull, S.A.: *See—*

Marbot, Roland, 5,463,343, Cl. 327-270.000.

Bullis, Bryan K.: *See—*

Brodnax, Timothy B.; Bullis, Bryan K.; King, Steven A.; Kogge, Peter M.; and Rickard, Dale A., 5,463,746, Cl. 395-375.000.

Bullmer, Wolfgang; and Neuffer, Kurt, to Robert Bosch GmbH. Method for controlling the shifting comfort in motor vehicles having an automatic transmission. 5,462,499, Cl. 477-120.000.

Bullmer, Wolfgang; Kronenberg, Klemens; and Ott, Herbert, to Robert Bosch GmbH. Method of actuating an automatic transmission. 5,462,501, Cl. 477-155.000.

Bullock, Andrew G.: *See—*

Pegg, Timothy J.; Hjipieris, George; and Bullock, Andrew G., 5,463,310, Cl. 324-95.000.

Bunk, Albert R.: *See—*

McGinniss, Vincent D.; Bunk, Albert R.; and Mikuni, Hiroyuki, 5,462,696, Cl. 252-500.000.

Bunkenburg, Brian K.: *See—*

Grube, Gary W.; Bunkenburg, Brian K.; and Naddell, Marc C., 5,463,617, Cl. 370-29.000.

Bunn-O-Matic Corporation: *See—*

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Bunsen Rush laboratories, Inc.: *See—*

Lerner, Michael R.; and Lerner, Ethan A., 5,462,856, Cl. 435-7.210.

Bunshah, Rointan F.: *See—*

Kossovsky, Nir; and Bunshah, Rointan F., 5,462,750, Cl. 424-493.000.

Buoli, Carlo; Mora, Giovanni; and Turillo, Tommaso, to Siemens Telecomunicazioni S.p.A. Microwave oscillator with improved phase noise characteristic. 5,463,360, Cl. 331-96.000.

Burckhardt, Carl, executor: *See—*

Wirth, Johannes; Gallo, Mario, deceased, 5,463,192, Cl. 177-25.140.

Burgess, Leslie: *See—*

Butcher, Jane L.; Ryan, Thomas A.; and Burgess, Leslie, 5,463,139, Cl. 568-683.000.

Burgoyne, William F., Jr.: *See—*

Pinschmidt, Robert K., Jr.; Dixon, Dale D.; Burgoyne, William F., Jr.; and Goldstein, Joel E., 5,463,007, Cl. 526-266.000.

Burkett, Michael J.; and Adonakis, Nikolaos A., to General Motors Corporation. Swash plate compressor with improved piston alignment. 5,461,967, Cl. 92-71.000.

Burkhardt, Dennis E.: *See—*

Pascucci, Gregory A.; Rasmussen, David E.; Decious, Gaylon M.; Garbe, James R.; Hyzer, Susan M.; Woest, Karen L.; Vairavan, Vairavan; Koch, David L.; Gottschalk, Donald A., Jr.; Burkhardt, Dennis E.; Standish, Darrell E.; Madaus, Paul W.; Spacek, Dan J.;, 5,463,735, Cl. 395-200.100.

Burkhardt, Elizabeth R., to Mine Safety Appliances Company. Synthesis of organohaloboranes and alkoxyorganoboranes. 5,463,131, Cl. 568-1.000.

Burnett, Brian S.: *See—*

Strong, David S.; Rosa, Richard P.; and Burnett, Brian S., 5,461,847, Cl. 56-16.700.

Burns, John R. Chemical sanitizing of foodware. 5,462,606, Cl. 134-18.000.

Burstein, Paul; Krieger, Allen S.; and Kubierschky, Klaus, to American Science and Engineering, Inc. X-ray detector suited for high energy applications with wide dynamic range, high stopping power and good protection for opto-electronic transducers. 5,463,224, Cl. 250-366.000.

Burward-Hoy, Trevor, to Sun Microsystems, Inc. Method for integrally packaging an integrated circuit with a heat transfer apparatus. 5,461,766, Cl. 29-447.000.

Burzynski, Dennis J.: *See—*

Gregory, James L.; Burzynski, Dennis J.; Rote, Bruce J.; and Sprowl, Frank L., 5,462,187, Cl. 215-350.000.

Bush, Alan M.: *See—*

Anderson, Charles R.; Warfield, Robert W.; Cseri, Istvan; Low, Murray K.; Liaw, Weikuo; and Bush, Alan M., 5,463,724, Cl. 395-148.000.

Bush, Rodney D.; and Bissett, Donald L., to Procter & Gamble Company, The. Chelator compositions comprising α-diamine compounds. 5,462,963, Cl. 514-248.000.

Buswell, Brian. Body mounted camera support assembly. 5,462,214, Cl. 224-224.000.

Butcher, Jane L.; Ryan, Thomas A.; and Burgess, Leslie, to Imperial Chemical Industries PLC. Production of difluoromethane. 5,463,139, Cl. 568-683.000.

Butler, Aaron S.: *See—*

Sullivan, Dennis J.; Butler, Aaron S.; and Kelley, Mark A., 5,461,866, Cl. 60-757.000.

Butters, Brian E.; and Powell, Anthony L., to Purific Environmental Technologies, Inc. Method and system for photocatalytic decontamination. 5,462,674, Cl. 210-748.000.

Buysch, Hans-Josef; Klausener, Alexander; Szablikowski, Klaus; Balser, Klaus; and Wilke, Michaela, to Wolff Walsrode Aktiengesellschaft. Polysaccharides, process for their preparation and their use. 5,463,034, Cl. 536-17.200.

Buysch, Hans-Josef: *See—*

Schön, Norbert; Rechner, Johann; Wagner, Paul; Buysch, Hans-Josef; Gasche, Hans-Erich; and Leiberich, Ricarda, 5,463,102, Cl. 558-274.000.

C. F. Martin & Company, Inc.: *See—*

Dresdner, Michael M.; and Headman, Robert K., 5,461,958, Cl. 84-267.000.

C.R. Bard, Inc.: *See—*

Stevens-Wright, Debbie; Russo, Massimo; Nielsen, Peter; and Bertram, Paul, 5,462,527, Cl. 604-95.000.

C.W. Zumbiel Co., The: *See—*

Kramer, Robert G., 5,462,158, Cl. 206-307.000.

Cabana, Jacqueline: *See—*

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Cacciola, Joseph: *See—*

Fevig, John M.; Abelman, Matthew M.; Amparo, Eugene C.; Cacciola, Joseph; Kettner, Charles A.; Pacofsky, Gregory J.; and Wang, Chia-Lin, 5,462,964, Cl. 514-423.000.

Cai, Xiong: *See—*

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Calcagno, Mark A.: *See—*

Yu, Chia-Nien; Pelosi, Stanford S., Jr.; and Calcagno, Mark A., 5,462,940, Cl. 514-235.800.

Calder, Douglas W.; and Bizley, Arthur J., to Square D Company. Proximity switches. 5,463,333, Cl. 327-78.000.

Calder, Douglas W.; and Bizley, Arthur J., to Square D Company. Proximity switches including long tail pair with emitter follower feedback. 5,463,354, Cl. 331-65.000.

Calderara, Reto; Jahreiss, Lothar; Sonderegger, Hans C.; and Caprez, Markus, to K.K. Holding AG. Sensor arrangement for installation in carriageways and runways. 5,461,924, Cl. 73-786.000.

Caldwell, Carol A., to Avery Dennison Corporation. Tabless diaper with a multi-component tape fastener. 5,462,540, Cl. 604-389.000.

Calgene Inc.: *See—*

  - Moloney, Maurice M.; and Radke, Sharon, 5,463,174, Cl. 800-205.000.
- Calhoun, Clyde D.; and Kessel, Carl R., to Minnesota Mining and Manufacturing Company. Structured flexible carrier web bearing a layer of silicone on predetermined surfaces. 5,462,765, Cl. 427-198.000.
- California Amplifier, Inc.: *See—*
  - West, Laurice J.; and Gabrelian, Edward E., 5,463,407, Cl. 343-786.000.
- California Institute of Technology: *See—*
  - Sarpeshkar, Rahul; and Mead, Carver A., 5,463,348, Cl. 330-253.000.
- Callejas, Ricardo J.; and Greenwood, Gil J., to Phillips Petroleum Company. Thermal cracking process. 5,463,159, Cl. 585-648.000.
- Calvo, Joseph, to Shapiro, Jeffrey S. Improved ceiling fan blade and hub assembly. 5,462,407, Cl. 416-132.00A.
- Calzone, Ronald J. Clamp for securing trailer ramp in transport position. 5,462,249, Cl. 248-316.700.
- Cambro Manufacturing Company: *See—*
  - Maddux, Larry D., 5,462,299, Cl. 280-47.350.
- Campbell, Bernard J.: *See—*
  - Waine, Peter J.; and Campbell, Bernard J., 5,462,149, Cl. 194-206.000.
- Campbell, Dean B.; and Korytkowski, Henry M., to Eastman Kodak Company. Surface inspection optical geometry alignment system. 5,463,429, Cl. 348-128.000.
- Campbell Fittings, Inc.: *See—*
  - Street, David G.; Paff, Thomas J.; Thomas, Dean A.; and McGlynn, Joseph P., 5,462,316, Cl. 285-81.000.
- Campbell, Jeffrey D.; and Gearing, Graham O., to Minnesota Mining and Manufacturing Co. Electrostatic discharge detector. 5,463,379, Cl. 340-657.000.
- Campbell, Kevin P.; Knudson, C. Michael; Kahl, Steven D.; Louis, Charles F.; and Mickelson, James R., to University of Iowa Research Foundation. Diagnosing malignant hyperthermia susceptibility by detection of abnormal proteolytic enzyme digestion fragments of the ryanodine receptor. 5,462,857, Cl. 435-7.210.
- Campbell, Patricia S.: *See—*
  - Enscore, David J.; Campbell, Patricia S.; Osborne, James L.; Smart, Melinda K.; and Yum, Su I., 5,462,745, Cl. 424-448.000.
- Campina-Melkunie bv: *See—*
  - Westerbeek, Johannes M. M.; Dijkgraaf, Jeroen T. M.; and Zijlmans, Joseph B. S., 5,462,759, Cl. 426-568.000.
- Canada, Her Majesty the Queen in right of, as represented by the Minister of Energy, Mines and Resources: *See—*
  - Goledzinowski, Maciej; and Birss, Viola I., 5,463,158, Cl. 585-520.000.
- Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence: *See—*
  - Liang, Septimus H.-C.; Harrison, Brian H.; and Pagotto, Jack, 5,462,908, Cl. 502-401.000.
- Canadian Fracmaster Ltd.: *See—*
  - Best, Jim E.; and Smith, Donald A., 5,462,129, Cl. 175-67.000.
- Cancer Institute: *See—*
  - Nakamura, Yusuke; and Sato, Takaaki, 5,463,026, Cl. 530-387.900.
- Candea Inc.: *See—*
  - Barnwell, Keith D., 5,462,194, Cl. 220-709.000.
- Cannan, Edward B., Jr.: *See—*
  - Bartlow, David H.; and Cannan, Edward B., Jr., 5,462,191, Cl. 220-469.000.
- Cannell, David W.: *See—*
  - Nguyen, Nghi V.; Cannell, David W.; and Mathews, Roger A., 5,461,925, Cl. 73-789.000.
- Canning, Peter D.: *See—*
  - Fox, Robert F.; and Canning, Peter D., 5,462,003, Cl. 114-316.000.
- Canon Denshi Kabushiki Kaisha: *See—*
  - Takahashi, Kazushi, 5,463,510, Cl. 360-99.070.
- Canon Kabushiki Kaisha: *See—*
  - Date, Nobuaki, 5,463,612, Cl. 369-219.000.
  - Funada, Masahiro; Ohta, Ken-ichi; Takaragi, Yoichi; and Ohta, Eiji, 5,463,469, Cl. 358-296.000.
  - Harigaya, Isao; Mogi, Hirokazu; Kozuki, Susumu; Iijima, Ryunosuke; Toyama, Masamichi; and Hirasawa, Masahide, 5,463,442, Cl. 354-400.000.
  - Inde, Masaaki, 5,463,295, Cl. 358-442.000.
  - Inoue, Takahiro; Goto, Masahiro; Sasame, Hiroshi; Tsukida, Shinichi; and Takano, Manabu, 5,463,450, Cl. 355-219.000.
  - Kashida, Motokazu; and Yamashita, Shinichi, 5,463,392, Cl. 341-110.000.
  - Kawasaki, Somei; and Iseki, Masami, 5,463,329, Cl. 326-77.000.
  - Kitani, Koji; and Nakanishi, Tohru, 5,463,265, Cl. 310-323.000.
  - Kosaka, Yoko; Takiguchi, Takao; Iwaki, Takashi; Togano, Takeshi; Nakamura, Shinichi; and Nakazawa, Ikuo, 5,462,694, Cl. 252-299.610.
  - Makita, Takeshi; Sugiura, Susumu; and Yamada, Osamu, 5,463,478, Cl. 358-455.000.
  - Matsuda, Hiroto, 5,463,412, Cl. 347-43.000.
  - Muraki, Masato; Suzuki, Akiyoshi; and Imai, Shunzo, 5,463,497, Cl. 359-618.000.
  - Nakazawa, Tamotsu, 5,463,700, Cl. 382-232.000.
  - Nishikawa, Koichiro, 5,463,610, Cl. 369-121.000.
  - Takeuchi, Tatsuo; Nami, Yasuo; and Ishizuka, Jiro, 5,463,457, Cl. 355-313.000.
  - Tateoka, Masamichi, 5,463,418, Cl. 347-244.000.
  - Uchiyama, Seiji; Noguchi, Akio; Ushio, Yukihide; Matsuo, Shinpei; Serizawa, Youji; Takeuchi, Makoto; Yamada, Kazurou; and Kato, Junichi, 5,463,410, Cl. 347-133.000.
  - Watanabe, Kazushi; Sasaki, Shinichi; Ikemoto, Isao; Miyabe, Shigeo; and Noda, Shinya, 5,463,446, Cl. 355-200.000.
  - Yamada, Hiromichi; Ohkubo, Masaharu; Ojima, Masaki; Sasame, Hiroshi; Kawana, Takashi; Seto, Kaoru; Mano, Hiroshi; Saito, Tetsuo; Kashihara, Atsushi; and Ito, Michio, 5,463,473, Cl. 358-300.000.
  - Yamamoto, Tohru; and Yoshida, Shigeo, 5,462,787, Cl. 428-195.000.
- Canuteson, Eric L.: *See—*
  - Zumberge, Mark A.; Canuteson, Eric L.; and Parker, Paul R., 5,461,914, Cl. 73-382.00R.
- Caprez, Markus: *See—*
  - Calderara, Reto; Jahreiss, Lothar; Sonderegger, Hans C.; and Caprez, Markus, 5,461,924, Cl. 73-786.000.
- Cardell Corporation: *See—*
  - Childs, Jonathan, 5,462,459, Cl. 439-843.000.
- Carl, James E.: *See—*
  - Payne, Scott T.; Wize, Gary A.; and Carl, James E., 5,462,332, Cl. 297-216.100.
- Carlberg, Stanley B. Solarium panel cap. 5,461,834, Cl. 52-466.000.
- Carleer, Lode, to AGFA-Gevaert N.V. Tone rendition of halfstone images by projection exposure. 5,462,841, Cl. 430-396.000.
- Carlson, Laurence: *See—*
  - Bender, David L.; Bryan, William C.; Brugman, William; Carlson, Laurence; and Fox, Charles E., 5,462,617, Cl. 156-96.000.
- Carlsson, Anders: *See—*
  - Bogentoft, Conny; Carlsson, Anders; and Tomlin, Janet, 5,462,742, Cl. 424-439.000.
- Carlsson, Per A. E.: *See—*
  - Svensson, Kjell A. I.; Wikstrom, Hakan V.; Carlsson, Per A. E.; Boije, Anna M. P.; Waters, R. Nicholas; Sonesson, Clas A.; Stjernlof, Nils P.; Andersson, Bengt R.; and Hansson, Lars O., 5,462,947, Cl. 514-317.000.
- Carobel Foam Limited: *See—*
  - Freedman, Clive A. H., 5,462,016, Cl. 119-28.500.
- Carpenter, Allan L.; and Adkins, Mark W., to Australia Sonar Systems Pty Ltd. Vibration isolation module. 5,463,193, Cl. 181-207.000.
- Carpenter, Joyce A.; and Conklin, Merlin L. Portable hydraulic lift step stool for raising handicapped patients to an elevated location. 5,461,736, Cl. 5-81.100.
- Carpenter, Val; and Webb, Steve W., to Conducit Repair Systems, Inc. Tubing coupling enclosure. 5,462,312, Cl. 285-15.000.
- Carr, James M.; and Harke, Elwood W., to Kimberly-Clark Corporation. Absorbent article with inversely related gradients. 5,462,537, Cl. 604-368.000.
- Carr, John P.; Larsen, Steven D.; and Eckenhoff, James B., to Alza Corporation. High agent loaded controlled release dispenser. 5,462,741, Cl. 424-438.000.
- Carrier Corporation: *See—*
  - Bolton, Theodore S.; and Michaels, John H., 5,461,879, Cl. 62-280.000.
  - Bolton, Theodore S.; and Stopyra, Stephen, 5,461,880, Cl. 62-298.000.
- Carrington, Janice D., to Plum Enterprises, Inc. Protective hat. 5,461,730, Cl. 2-411.000.
- Carroll, Lewis; Hendry, George; and Picker, Franck. Cyclotron and associated magnet coil and coil fabricating process. 5,463,291, Cl. 315-502.000.
- Carroll, Walter D. Method of producing methane gas from a coal seam. 5,462,116, Cl. 166-249.000.
- Carrozza, Primo; and Da Roit, Giovanni, to Ciba-Geigy Corporation. Siloxane derivatives of 2,2,6,6-tetramethylpiperidine compounds as stabilizers. 5,463,058, Cl. 546-14.000.
- Carson, Robert T.; Hogrefe, Arnold W.; and Juskey, Frank J., Jr., to Motorola, Inc. Electrically conductive adhesive. 5,463,190, Cl. 174-259.000.
- Carter, Leonard R., Jr. Breakaway fishing sinker. 5,461,821, Cl. 43-43.120.
- Carter-Wallace Inc.: *See—*
  - Sofia, Robert D., 5,462,966, Cl. 514-483.000.
- Carver, Juanita. Bed sore pad. 5,462,519, Cl. 602-47.000.
- Carver, Paul J. Ratchet transfer device. 5,461,949, Cl. 81-57.300.
- Casellas, Pierre: *See—*
  - Barth, Francis; Casellas, Pierre; Congy, Christian; Martinez, Serge; and Rinaldi, Murielle, 5,462,960, Cl. 514-406.000.
- Casey, James A.; and McGill, Robert E., to Northrop Grumman Corporation. MRI/hyperthermia dual function antenna system. 5,462,055, Cl. 128-653.500.
- Casio Computer Co., Ltd.: *See—*
  - Nakae, Tetsiochi; and Matsubara, Kunihiro, 5,463,691, Cl. 381-61.000.
  - Yamada, Hiroyasu, 5,463,420, Cl. 348-294.000.
- Cassell, Ronald L., to DowElanco. Method for controlling tree growth. 5,461,824, Cl. 47-57.500.
- Castle, Brian R.; and Scott, James J., to Scott Investment Partners. Mine roof support cribbing system. 5,462,391, Cl. 405-302.200.
- Castleberry, Donald E., to General Electric Company. Thin film circuits with high density connector. 5,463,242, Cl. 257-448.000.
- Catalytica, Inc.: *See—*
  - Betta, Ralph D.; Shoji, Toru; and Tanaka, Seiichiro, 5,461,864, Cl. 60-723.000.
- Catanese, Anthony T., Jr. Shut-off control system for oil/gas wells. 5,462,114, Cl. 166-53.000.
- Caterpillar Inc.: *See—*
  - Boen, Charles G.; Hadank, John M.; McGuire, Kenneth J.; Schricker, David R.; and Scholl, Rolland D., 5,463,567, Cl. 364-551.010.
  - Conway, Scott R., 5,463,267, Cl. 313-141.000.
  - Jeffers, Scott E.; and Frankel, David B., 5,462,309, Cl. 280-759.000.
  - Love, W. John, 5,463,521, Cl. 361-58.000.

- Purcell, Robert J., 5,462,345, Cl. 305-56.000.
- Rocke, David J., 5,461,803, Cl. 37-443.000.
- Shinogle, Ronald D., 5,462,030, Cl. 123-457.000.
- Stratton, Ken L.; Lueschow, Kevin J.; Barton, James C.; and Hayes, Thomas G., 5,462,125, Cl. 172-826.000.

Cavanagh, Edward T., Jr.: *See—*
- Morrissey, Douglas E.; Cavanagh, Edward T., Jr.; and Ng, Kin H., 5,463,762, Cl. 395-185.020.

Cawood, Charles D. Fiberoptic casing for endoscopes and method of making. 5,463,712, Cl. 385-117.000.

Cazort, J. Guy; and Richardson, Donald G., to Richardson Technologies, Ltd. Acceleration sensitive shock absorber. 5,462,140, Cl. 188-275.000.

CDM - Quality Fish A/S/: *See—*
- Fredsby, Bent E.; and Wormslev, Erik C., 5,462,478, Cl. 452-135.000.

CE.TE.V. Centro Technologie Del Vuoto: *See—*
- Misiano, Carlo; and Simonetti, Enrlco, 5,462,602, Cl. 118-718.000.

Cebulka, Kathleen D.: *See—*
- Fisher, Gregory M.; Cebulka, Kathleen D.; Man, Susan K.; Nazif, Zaher A.; and Vinciguerra, Lori J., 5,463,682, Cl. 379-201.000.

Cegelec Metals Systems: *See—*
- Du Parc, Jacques; Glinski, Christophe; and Wursteisen, Michel, 5,463,653, Cl. 373-108.000.

Celgene Corporation: *See—*
- Muller, George W., 5,463,063, Cl. 546-201.000.

Celtrix Pharmaceuticals, Inc.: *See—*
- Ogawa, Yasushi; Schmidt, David; and Dasch, James, 5,462,925, Cl. 514-12.000.

Cenex/Land O'Lakes Agronomy Company: *See—*
- Gednalske, Joe V.; and Herzfeld, Robert W., 5,463,180, Cl. 504-323.000.

Centre National de la Recherche Scientifique: *See—*
- Correa, Arlene G.; Denis, Jean-Noel; and Greene, Andrew E., 5,463,106, Cl. 560-39.000.
- Rousset, Abel; and Devaux, Xavier, 5,462,903, Cl. 501-127.000.

CertainTeed Corporation: *See—*
- Beck, David H., 5,461,839, Cl. 52-519.000.

Cesar, Max R.: *See—*
- Sudhakar, Chakka; Dolfinger, Frank, Jr.; Cesar, Max R.; Patel, Mahendra S.; and Fritz, Paul O., 5,462,651, Cl. 208-143.000.

Ceute S.A.: *See—*
- Bianchi, Emilio, 5,462,411, Cl. 416-202.000.

Chaloner-Gill, Benjamin; and Golovin, M. Neal. Solid electrolyte obtained by the polymerization of diacrylate monomer having a rigid alkane segment. 5,463,179, Cl. 429-192.000.

Chamberlin, Steven A.: *See—*
- Riley, David A.; Chamberlin, Steven A.; and Bhatia, Ashok V., 5,463,142, Cl. 568-833.000.

Chambers, Michael R.: *See—*
- Jennings, Alfred R., Jr.; and Chambers, Michael R., 5,462,118, Cl. 166-312.000.

Champion Containers: *See—*
- Cummings, Kasey H.; and Champion, Robert D., 5,461,988, Cl. 108-51.300.

Champion, Robert D.: *See—*
- Cummings, Kasey H.; and Champion, Robert D., 5,461,988, Cl. 108-51.300.

Chandler, Dixie N.: *See—*
- Chandler, Ricky D.; and Chandler, Dixie N., 5,462,328, Cl. 294-143.000.

Chandler, Ricky D.; and Chandler, Dixie N. Ball carrier apparatus. 5,462,328, Cl. 294-143.000.

Chandrasekaran, Kugalur S.; Mills, Daniel M.; and Ogletree, Richard, to Ford Motor Company. Variable speed fluid bearing and method of use. 5,462,364, Cl. 384-111.000.

Chaney, Michael T.; and Morton, Philip G., to Aluminum Company of America. Window meeting rail. 5,461,837, Cl. 52-204.680.

Chang, Chung-Yi: *See—*
- Chen, Jui-Hsiang; Wei, Jeng; Hu, Andrew T.; Lee, Yu-Der; Laiw, Ru-Fong; Chen, Muh-Lan; Chang, Chung-Yi; Lee, Fan-Yen; and Jiang, Shu-Fang, 5,462,704, Cl. 264-41.000.

Chang, Yuan F., to Gamemax Corporation. Collecting device for currencies. 5,462,150, Cl. 194-206.000.

Chao, Francis C., deceased (by Johanna T. Chao, legal representative); Chao, Michael S., heir; Chao, Mark S., heir; and Chao, Lorraine S., heir, to PRP, Inc. Inhibition of platelet binding. 5,462,752, Cl. 424-532.000.

Chao, Johanna T., legal representative: *See—*
- Chao, Francis C., deceased; Chao, Michael S., heir; Chao, Mark S., heir; and Chao, Lorraine S., heir, 5,462,752, Cl. 424-532.000.

Chao, Liang; Lin, Tien-Ler; and Yiu, Tom D., to Macronix International Co., Ltd. Erase and program verification circuit for non-volatile memory. 5,463,586, Cl. 365-210.000.

Chao, Lorraine S., heir: *See—*
- Chao, Francis C., deceased; Chao, Michael S., heir; Chao, Mark S., heir; and Chao, Lorraine S., heir, 5,462,752, Cl. 424-532.000.

Chao, Mark S., heir: *See—*
- Chao, Francis C., deceased; Chao, Michael S., heir; Chao, Mark S., heir; and Chao, Lorraine S., heir, 5,462,752, Cl. 424-532.000.

Chao, Michael S., heir: *See—*
- Chao, Francis C., deceased; Chao, Michael S., heir; Chao, Mark S., heir; and Chao, Lorraine S., heir, 5,462,752, Cl. 424-532.000.

Chapman, Arthur S., to Baxter International Inc. Peristaltic pump with linear pump roller positioning mechanism. 5,462,417, Cl. 417-477.700.

Chase, Edward W., III: *See—*
- Smith, Dale E.; and Chase, Edward W., III, 5,462,410, Cl. 416-165.000.

Chastagnoi, Raymond: *See—*
- Stubler, Jérôme; and Chastagnoi, Raymond, 5,461,743, Cl. 14-22.000.

Chauvet, Philip G.: *See—*
- Blair, Rodney L.; and Chauvet, Philip G., 5,462,505, Cl. 482-27.000.

Check, Joseph A., III, to Research Frontiers Incorporated. Light valve employing a film comprising an encapsulated liquid suspension, and method of making such film. 5,463,491, Cl. 359-296.000.

Check, Joseph A., III, to Research Frontiers Incorporated. Light modulating film of improved clarity for a light valve. 5,463,492, Cl. 359-296.000.

Chedid, Louis: *See—*
- Brogden, Kim A.; and Chedid, Louis, 5,462,735, Cl. 424-255.100.

Chee, Hiram: *See—*
- Samson, Gene; Engelson, Erik T.; Chee, Hiram; and Woodard, Robert E., 5,462,523, Cl. 604-30.000.

Chemello, Jean-Pierre: *See—*
- Paris, Jean; and Chemello, Jean-Pierre, 5,461,802, Cl. 36-121.000.

Chemical Grouting Co., Ltd.: *See—*
- Iji, Masahiro; Yoda, Masami; Suzuki, Shin; Ishizuka, Kaoru; Kubo, Sotoo; Yamaki, Isao; and Hashimoto, Toshikuni, 5,462,672, Cl. 210-727.000.

Chemring Limited: *See—*
- Marks, John W. G.; and Yates, Simon J., 5,461,960, Cl. 89-1.510.

Chen, Chih-Chung: *See—*
- Bair, Owen S.; Yin, Patrick; and Chen, Chih-Chung, 5,463,563, Cl. 364-490.000.

Chen, Chin-Chuan. Oil filter structure. 5,462,662, Cl. 210-223.000.

Chen, Ching S.: *See—*
- Hong-Rong, Shiau; and Chen, Ching S., 5,462,019, Cl. 119-795.000.

Chen, Chung-Hsu; and Yen, Huan-Chun, to TRW Inc. Heterojunction step doped barrier cathode emitter. 5,463,275, Cl. 313-495.000.

Chen, Dao-Long, to AT&T Global Information Solutions Company; and Hyundai Electronics America. Supply voltage tolerant phase-locked loop circuit. 5,463,352, Cl. 331-1.00R.

Chen, George Y.; and Lee, Edward H. P., to International Business Machines Corporation. Method for chemically scribing wafers. 5,462,636, Cl. 216-17.000.

Chen, Jui-Hsiang; Wei, Jeng; Hu, Andrew T.; Lee, Yu-Der; Laiw, Ru-Fong; Chen, Muh-Lan; Chang, Chung-Yi; Lee, Fan-Yen; and Jiang, Shu-Fang, to Industrial Technology Research Institute. Method for preparing a porous polyurethane vascular graft prosthesis. 5,462,704, Cl. 264-41.000.

Chen, Muh-Lan: *See—*
- Chen, Jui-Hsiang; Wei, Jeng; Hu, Andrew T.; Lee, Yu-Der; Laiw, Ru-Fong; Chen, Muh-Lan; Chang, Chung-Yi; Lee, Fan-Yen; and Jiang, Shu-Fang, 5,462,704, Cl. 264-41.000.

Chen, Ning; Renz, Walter L.; and Pinschmidt, Robert K., Jr., to Air Products and Chemicals, Inc. Michael adducts of N-vinylformamide and acrylic and methacrylic esters. 5,463,110, Cl. 560-172.000.

Chen, Shan-Hu. Pump hanger for an aquarium. 5,462,415, Cl. 417-360.000.

Chen, Shih-Chang, to Oki Electric Industry Co., Ltd. Method of making semiconductor device comprising a titanium nitride film. 5,462,895, Cl. 437-200.000.

Chen, Zhizhang; and Rohatgi, Ajeet, to Georgia Tech Research Corporation. Methods for passivating silicon devices at low temperature to achieve low interface state density and low recombination velocity while preserving carrier lifetime. 5,462,898, Cl. 437-235.000.

Cheng, Jonathan: *See—*
- Chou, Luk; Cheng, Jonathan; and Lin, Chin I., 5,463,536, Cl. 362-102.000.

Cheng, Tien-Chu. Weather protective cover for vehicle. 5,462,329, Cl. 296-98.000.

Cherpeck, Richard E., to Chevron Chemical Company. Fuel additive compositions containing poly(oxyalkylene)hydroxyaromatic esters and aliphatic amines. 5,462,567, Cl. 44-347.000.

Cherry, Doyle: *See—*
- Pounds, Russell; and Cherry, Doyle, 5,462,721, Cl. 423-226.000.

Chesnutt, Dennis P.; and Beste, Randal T., to Halliburton Energy Services, Inc. Induction log sonde feedpipe having a plurality of tubes arranged within it and windows to facilitate the passage of the conductors. 5,463,319, Cl. 324-339.000.

Chevron Chemical Company: *See—*
- Cherpeck, Richard E., 5,462,567, Cl. 44-347.000.

Chi, Wei-Kuang: *See—*
- Hsieh, Jih-Han; Shih, Shu-Ching; Chi, Wei-Kuang; Chu, Yi-Ding; and Lin, Ae-Ning, 5,462,863, Cl. 435-69.300.

Chia, Chok J.; Alagaratnam, Manian; Low, Qwai H.; and Lim, Seng-Sooi, to LSI Logic Corporation. High power dissipating packages with matched heatspreader heatsink assemblies. 5,463,529, Cl. 361-704.000.

Chia, Keng S., to Hewlett-Packard Company. Sheet advancement system with phase-adjustable roller arrangement. 5,462,373, Cl. 400-62.400.

Chiang, Marilyn C.; Fenley, R. Earl, Jr.; Holland, George F.; Javvaji, Anand K.; and Sreedhara, Ramadevi, to AT&T IPM Corp. Testing of communication services and circuits. 5,463,670, Cl. 379-27.000.

Chiang, Weilong L.: *See—*
- Lindemann, David C.; Chiang, Weilong L.; Luetkens, Melvin L., Jr.; Pischke, Robert D.; and Schubert, John C., 5,462,794, Cl. 428-317.100.

Chiba, Shunichi: *See—*
- Futatsuka, Rensei; Chiba, Shunichi; and Kumagai, Junichi, 5,463,247, Cl. 257-666.000.

Chibwe, Malama: *See—*

  - Pinnavaia, Thomas J.; Perez-Bernal, Elena M.; Ruarno-Casero, Ricardo; and Chibwe, Malama, 5,463,042, Cl. 540-139.000.
- Chien, Jui-Lung, to Jina Manufacturer Thai Co., Ltd. Go-cart restrainer. 5,462,300, Cl. 280-87.051.
- Childs, Jonathan, to Cardell Corporation. Spring-type electrical receptacle. 5,462,459, Cl. 439-843.000.
- Ching, Douglas: *See*—
  - Vogelgesang, Doug; and Ching, Douglas, 5,462,347, Cl. 312-247.000.
- Chisholm, Michael F.; and Forehand, David I., to Texas Instruments Incorporated. Masked radiant anneal diffusion method. 5,462,882, Cl. 437-5.000.
- Chiu, Tien-Heng, to AT&T Corp. Substrates and methods for gas phase deposition of semiconductors and other materials. 5,462,012, Cl. 117-85.000.
- Chiu, Tzu-Yin; Erceg, Frank M.; Krafty, Francis A.; Liu, Te-Yin M.; Possanza, William A.; and Sung, Janmye, to AT&T IPM Corp. Process for manufacturing semiconductor BICMOS device. 5,462,888, Cl. 437-57.000.
- Cho, Jung H.; Oh, Chang H.; and Nam, Ki H., to Dong Kook Pharmaceutical Co., Ltd.; and Kwon, Ki-Beom. 1-β-methyl-2-thiolic carbapenem derivatives. 5,463,046, Cl. 540-350.000.
- Choat, Michael J.: *See*—
  - Hull, Harold L.; and Choat, Michael J., 5,462,466, Cl. 441-76.000.
- Choe, Gyu S.: *See*—
  - Kim, Jung C.; Oh, Dong Y.; Choe, Gyu S.; Hong, Kyung S.; Kim, Kyung H.; Lee, Joo H.; Lee, Ha I.; Park, Kyeong B.; Gil, Dong S.; Kwon, Oh H.; and Kwon, Byoung H., 5,461,886, Cl. 68-3.0SS.
- Chonan, Toru, to NEC Corporation. Dynamic memory device having a plurality of internal power sources. 5,463,588, Cl. 365-226.000.
- Choon, Los P.; and Redman, Brian, to Motorola, Inc. PCMCIA electronics housing. 5,463,531, Cl. 361-737.000.
- Chopra, Dharam P., to Wayne State University. Human diploid salivary gland epithelial cell lines. 5,462,870, Cl. 435-240.200.
- Chou, Ching-Ho. Printing press. 5,461,978, Cl. 101-248.000.
- Chou, Daniel S., to Microsoft Corporation. Method and system of color halftone reproduction. 5,463,471, Cl. 358-298.000.
- Chou, Luk; Cheng, Jonathan; and Lin, Chin I. Umbrella with a light source and light refracting means. 5,463,536, Cl. 362-102.000.
- Chow, Alex C.: *See*—
  - Tate, Bruce A.; Chow, Alex C.; and Gest, Stephen B., 5,463,769, Cl. 395-700.000.
- Chowdhury, Sanghamitra: *See*—
  - Hubbell, Jeffrey A.; Elbert, Donald; Hill-West, Jennifer L.; Drumheller, Paul D.; Chowdhury, Sanghamitra; and Sawhney, Amarpreet, 5,462,990, Cl. 525-54.100.
- Choy, Clement K.; and Reboa, Paul F., to Clorox Company, The. Composition and method for developing extensional viscosity in cleaning compositions. 5,462,689, Cl. 252-90.000.
- Christensen, Edward L.: *See*—
  - Kotwicki, Allan J.; Szuszman, Paul J.; Christensen, Edward L.; and Lloyd, Susan J., 5,462,038, Cl. 123-681.000.
- Chrysler Corporation: *See*—
  - Benford, Howard L.; and Leising, Maurice B., 5,462,500, Cl. 477-154.000.
- Chu, Federico: *See*—
  - Hodson, Price R.; Chu, Federico; Buchanan, Arnold; and Montividas, Robert E., 5,461,910, Cl. 73-170.120.
- Chu, Tek-Che, to AT&T IPM Corp. Submarine cable having a centrally located tube containing optical fibers. 5,463,711, Cl. 385-101.000.
- Chu, Yi-Ding: *See*—
  - Hsieh, Jih-Han; Shih, Shu-Ching; Chi, Wei-Kuang; Chu, Yi-Ding; and Lin, Ae-Ning, 5,462,863, Cl. 435-69.300.
- Chui, Benjamin W.: *See*—
  - Sutterlin, Philip H.; Downey, Walter J.; Chui, Benjamin W.; Stewart, J. Marcus; and Hurlbut, Amy O., 5,463,662, Cl. 375-351.000.
- Chujo, Akihiko: *See*—
  - Yui, Toshitake; Yamashita, Yoshiro; Koide, Fuminori; Chujo, Akihiko; and Hashimoto, Ken, 5,462,590, Cl. 106-20.00R.
- Chujo, Takao; Hamano, Hisashi; Nishiyama, Masanori; Saeki, Yasuhiro; Ogawa, Tatsuya; and Endou, Kouhei, to Teijin Ltd. Magnetic tape for use in cassette for digital audio tape recorder and biaxially oriented polyester base film therefor. 5,463,015, Cl. 528-308.200.
- Chung, Harvey H.: *See*—
  - Liu, Sung-Tsuen; and Chung, Harvey H., 5,462,722, Cl. 423-311.000.
- Cianciara, Wojciech: *See*—
  - Krebs, Stefan; Kettl, Ludwig; and Cianciara, Wojciech, 5,462,040, Cl. 123-688.000.
- Ciba-Geigy Corporation: *See*—
  - Carrozza, Primo; and Da Roit, Giovanni, 5,463,058, Cl. 546-14.000.
  - Eckhardt, Claude; and Reinehr, Dieter, 5,462,564, Cl. 8-111.000.
  - Kuster, Kaspar, 5,462,599, Cl. 118-503.000.
  - Schneider, Peter; Ramos, Gerardo; and Bersier, Jacques, 5,463,047, Cl. 540-362.000.
  - Togni, Antonio; Spindler, Felix; Zanetti, Nadia; and Tijani, Amina, 5,463,097, Cl. 556-14.000.
- Ciener, Jonathan A. Gun magazine apparatus and method. 5,461,811, Cl. 42-50.000.
- Ciesielski, Denise: *See*—
  - Poppe, George; Ciesielski, Denise; and Matlock, Mark, 5,462,593, Cl. 106-124.000.
- Cifuentes, Martin E.: *See*—
  - Greenleaf, Suzanne M.; and Cifuentes, Martin E., 5,462,587, Cl. 106-2.000.
- Cigar Lake Mining Corporation: *See*—
  - Marvy, Alain A., 5,463,172, Cl. 588-252.000.
- Cilano, Joseph E. Controllable parallel axis differential. 5,462,497, Cl. 475-252.000.
- Cimenti, Giovanni: *See*—
  - Lonardi, Emile; Andonov, Radomir; and Cimenti, Giovanni, 5,462,260, Cl. 266-226.000.
- Cipolla, Mark E., to Royal Appliance Mfg. Co. Telescoping wand for vacuum cleaners. 5,462,311, Cl. 285-7.000.
- Citra Science Ltd.: *See*—
  - Vlasblom, Jack, 5,462,729, Cl. 424-61.000.
- Ciumaga, Massimo. Method of making a screwdriver. 5,461,944, Cl. 76-119.000.
- Claircom Communications Group, Inc.: *See*—
  - Kepley, Walter R., III; Greer, Dana J.; and Shields, Richard A., Jr., 5,463,678, Cl. 379-91.000.
- Clark, C. W.: *See*—
  - Gruender, Eugene H., Jr.; Clark, C. W.; and Kraft, Douglas R., 5,463,589, Cl. 365-230.010.
- Clark, Linda A.: *See*—
  - Becker, Richard A.; Clark, Linda A.; and Lambert, Diane, 5,462,438, Cl. 434-430.000.
- Clark, Robert: *See*—
  - Jonak, Zdenka L.; Debouck, Christine; Clark, Robert; and Trulli, Stephen, 5,462,872, Cl. 435-240.200.
- Clarkson, Allen B., Jr.; and Grady, Robert W., to New York University. Method and compositions for treatment or prevention of pneumocystic carinii infections. 5,462,969, Cl. 514-575.000.
- Clauberg, Rolf; Harder, Christoph; Heusch, Christan; and Jaeckel, Heinz, to International Business Machines Corporation. Optical waveguide isolation. 5,463,705, Cl. 385-14.000.
- Claudio I. Zanelli, Intec Research Company: *See*—
  - Zanelli, Claudio I.; and Whitehead, Frank R., 5,463,593, Cl. 367-13.000.
- Claudius Peters Aktiengesellschaft: *See*—
  - Wellmann, Hans-Peter, 5,462,237, Cl. 241-57.000.
- Clausen, Eivind; and Fridheim, Ketil, to Allsop, Inc. Data card cleaner. 5,461,747, Cl. 15-104.940.
- Cleon, Louis-Marie: *See*—
  - Guardiola, Pierre-Henri; Iv, Van-Tha; Metzger, Albert; Cleon, Louis-Marie; and Dannawi, Marwan, 5,462,144, Cl. 188-377.000.
- Cleophax, Jeannine: *See*—
  - Bischoff, Erwin; Gao, Zhan; Wohlfeil, Stefan; Hecker, Gabriele; Cleophax, Jeannine; Dubreuil, Didier; Gero, Stéphane; Olesker, Alice; Verre-Sebrie, Catherine; Vieira de Almeida, Mauro; and Vass, Georges, 5,463,087, Cl. 549-336.000.
- Clifton, Terry P.: *See*—
  - Cohen, John H.; Leitko, Curtis E.; Pittard, Gerard T.; Clifton, Terry P.; and Rockower, Gerald, 5,462,077, Cl. 137-15.000.
- Cloetens, Henri, to U.S. Philips Corporation. Device and method for decoding a stream of data symbols which are interleaved and subject to a discontinuity thereof involving labelling those data symbols which are suspect as a result of the discontinuity. 5,463,640, Cl. 371-37.100.
- Clorox Company, The: *See*—
  - Choy, Clement K.; and Reboa, Paul F., 5,462,689, Cl. 252-90.000.
- Clupper, Charles B.; Emigh, Jonathan D.; Mulkey, Steven L.; Fehringer, Robert L.; Flickner, Brett J.; Saldana, Daniel M.; and Delfer, Frank W., III. Vertical tray collator with sheet discharge pusher member. 5,462,399, Cl. 414-790.300.
- CNC Corporation: *See*—
  - Tyler, Arthur W., 5,461,893, Cl. 72-7.000.
- Coassin, Peter J.; Konrad, Kenneth D.; Rampal, Jang B.; and Cook, Ronald M., to Beckman Instruments, Inc. Inverse linkage oligonucleotides for chemical and enzymatic processes. 5,462,854, Cl. 435-6.000.
- Coca Cola Company, The: *See*—
  - Ladina, Joseph M.; Exley, Timothy R.; and Szedon, William A., 5,462,186, Cl. 215-330.000.
- Coffy, René L., to Europcopter France. Blade made of thermoplastic composite, in particular for ducted tail rotor of a helicopter, and its method of manufacture. 5,462,408, Cl. 416-134.00A.
- Cohen, Jack. Post-surgical toe guard and tongue. 5,462,069, Cl. 128-893.000.
- Cohen, John H.; Leitko, Curtis E.; Pittard, Gerard T.; Clifton, Terry P.; and Rockower, Gerald, to Brooklyn Union Gas Co.; and Consolidated Edison Company of New York, Inc. Apparatus and method for shutting off fluid flow in a pipe main. 5,462,077, Cl. 137-15.000.
- Colaianna, Pasqua: *See*—
  - Abusleme, Julio A.; and Colaianna, Pasqua, 5,463,006, Cl. 526-247.000.
- Colgate, George S. Autograph button cover. 5,462,170, Cl. 206-574.000.
- Colgate-Palmolive Co.: *See*—
  - Rhinesmith, Robert, 5,462,690, Cl. 252-126.000.
  - Yianakopoulos, Georges, 5,462,697, Cl. 252-528.000.
- Colin Corporation: *See*—
  - Oka, Tohru; Harada, Chikao; and Suzuki, Hidenori, 5,462,051, Cl. 128-630.000.
- Collias, Dimitris I.: *See*—
  - Stahley, Robert E.; Lund, Mark T.; and Collias, Dimitris I., 5,462,208, Cl. 222-207.000.
- Colligan, Francis D., to United States Surgical Corporation. Apparatus for attaching surgical suture components. 5,462,543, Cl. 606-1.000.

- Collins, Bobby A.; Grimes, Glenn R.; and Reddy, Dharam J., to Bell Helicopter Textron Inc. Helicopter landing gear assembly. 5,462,242, Cl. 244-108.000.
- Collins, Cynthia B.; Lee, Young; and Tagatac, Daniel D., to AT&T Corp. Blocked cell notification system. 5,463,683, Cl. 379-201.000.
- Collumeau, Yoland: *See—*
  - Pouet, Claude; and Collumeau, Yoland, 5,462,219, Cl. 228-49.500.
- Colorado Seminary: *See—*
  - Lesko, Jon M.; Brown, Larry L.; and Keller, James A., 5,463,222, Cl. 250-330.000.
- Coltsin, Boris: *See—*
  - Gavlin, Gilbert; and Coltsin, Boris, 5,462,584, Cl. 95-231.000.
- Columbia Industries, Inc.: *See—*
  - MacDonald, Wayne D., 5,462,491, Cl. 473-126.000.
- Cominco Ltd.: *See—*
  - Vincze, Albert M.; Seymour, Theodore J.; Culkeen, Patrick; Tang, Nai-Yong; Lewis, Gerald P.; Niessen, Paul; and Marlow, John V., 5,462,109, Cl. 164-479.000.
- Comm/Scope: *See—*
  - Wessels, Rob, 5,462,803, Cl. 428-380.000.
- Commissariat a l'Energie Atomique: *See—*
  - Alfille, Jean-Pascal, 5,463,215, Cl. 250-206.100.
  - Azzolini, Raymond; and Rochard, Pierre, 5,461,928, Cl. 73-818.000.
  - Duret, Denis, 5,463,318, Cl. 324-301.000.
- Commonwealth Scientific and Industrial Research Organisation: *See—*
  - Szirmai, Stephen G., 5,463,524, Cl. 361-230.000.
- Compagnie Francaise des Etablissements Gaillard: *See—*
  - Gaillard, Christian; and Papineschi, Thierry, 5,462,258, Cl. 256-13.100.
- Compagnie Francaise d' et de Construction-Technique: *See—*
  - Paradowski, Henri, 5,461,870, Cl. 62-11.000.
- Compaq Computer Corp.: *See—*
  - Culley, Paul R., 5,463,761, Cl. 395-550.000.
  - Fry, Walter G.; and Wolford, Jeff W., 5,463,753, Cl. 395-473.000.
  - Galloway, William C., 5,463,743, Cl. 395-285.000.
  - Pies, John R., 5,462,600, Cl. 118-503.000.
- Composite Manufacturing & Research, Inc.: *See—*
  - Foster, Thomas M., 5,461,823, Cl. 47-33.000.
- Computational Systems, Inc.: *See—*
  - Piety, Richard W., 5,461,791, Cl. 33-1.00N.
- Conducit Repair Systems, Inc.: *See—*
  - Carpenter, Val; and Webb, Steve W., 5,462,312, Cl. 285-15.000.
- Congy, Christian: *See—*
  - Barth, Francis; Casellas, Pierre; Congy, Christian; Martinez, Serge; and Rinaldi, Murielle, 5,462,960, Cl. 514-406.000.
- Conklin, Merlin L.: *See—*
  - Carpenter, Joyce A.; and Conklin, Merlin L., 5,461,736, Cl. 5-81.100.
- Conner Peripherals, Inc.: *See—*
  - Morehouse, James H.; Furay, David M.; Blagaila, John; Dion, F. Eugene; Shelstad, Scott A.; and Woods, Jimmy L., 5,463,507, Cl. 360-97.020.
- Connor, David T.: *See—*
  - Boschelli, Diane H.; Connor, David T.; and Hoefle, Milton L., 5,462,952, Cl. 514-364.000.
- Consolidated Edison Company of New York, Inc.: *See—*
  - Cohen, John H.; Leitko, Curtis E.; Pittard, Gerard T.; Clifton, Terry P.; and Rockower, Gerald, 5,462,077, Cl. 137-15.000.
- Consorzio Ce.Te.V. Centro Tecnologie del Vuoto: *See—*
  - Misiano, Carlo; Simonetti, Enrico; and Staffetti, Francesco, 5,462,779, Cl. 428-34.700.
- Contico International, Inc.: *See—*
  - Foster, Donald D.; and Nelson, Philip L., 5,462,209, Cl. 222-376.000.
- Converter Accessory Corp.: *See—*
  - Damour, Lawrence R , 5,461,760, Cl. 26-99.000.
- Conway, Scott R., to Caterpillar Inc. Spark plug with automatically adjustable gap. 5,463,267, Cl. 313-141.000.
- Cook, Ronald M.: *See—*
  - Coassin, Peter J.; Konrad, Kenneth D.; Rampal, Jang B.; and Cook, Ronald M., 5,462,854, Cl. 435-6.000.
- Cooke, Robert S., to Protex Fasteners Limited. Toggle fastener. 5,462,318, Cl. 292-200.000.
- Cookson, Christopher J.; and Ostrover, Lewis S., to Time Warner Entertainment Co., L.P. Data block format for software carrier and player therefor. 5,463,565, Cl. 364-514.00R.
- Cooper Industries, Inc.: *See—*
  - Hassler, Stephen P.; Johnson, Stephen P.; and Lapp, John, 5,463,366, Cl. 337-176.000.
- Cope, L. Todd; and Watson, James A., to Altera Corporation. Expanded programmable logic architecture. 5,463,328, Cl. 326-41.000.
- Coppens, Paul: *See—*
  - Hauquier, Guido; Cortens, Willem; Coppens, Paul; Vermeersch, Joan; Mostaert, Erik; and Verschueren, Eric, 5,462,833, Cl. 430-159.000.
- Coralplex, Inc.: *See—*
  - Berry, William W., 5,462,723, Cl. 423-347.000.
- Corba, Robert E.: *See—*
  - Demarest, Scott W.; Corba, Robert E.; Miller, Allen D.; Fritz, John M.; and Shanklin, Donald J., 5,462,099, Cl. 141-3.000.
- Cormier, Robert: *See—*
  - Cormier, Roger; Cormier, Robert; and Riopel, Jocelyn, 5,461,846, Cl. 53-571.000.
- Cormier, Roger; Cormier, Robert; and Riopel, Jocelyn, to Atelier D'usinage Cormier & Freres Inc. High speed bag packaging machine. 5,461,846, Cl. 53-571.000.
- Cornelissen, Herman; and Wouters, Paul. Hightight film package. 5,462,164, Cl. 206-389.000.
- Corp, John G.: *See—*
  - Belden, Steven V.; Belden, Dennis D., Jr.; and Corp, John G., 5,462,115, Cl. 166-177.300.
- Correa, Arlene G.; Denis, Jean-Noel; and Greene, Andrew E., to Centre National de la Recherche Scientifique. Process for the enantioselective preparation of phenylisosrine derivatives. 5,463,106, Cl. 560-39.000.
- Cortens, Willem: *See—*
  - Hauquier, Guido; Cortens, Willem; Coppens, Paul; Vermeersch, Joan; Mostaert, Erik; and Verschueren, Eric, 5,462,833, Cl. 430-159.000.
- Cortes Guasch, Esteve; and Bruguera, Raimon Soler, to Bendix Espana S.A. Power-assisted steering with automatic compensation for clearance. 5,461,964, Cl. 91-375.00R.
- Costall, Brenda: *See—*
  - Perregaard, Jens K.; and Costall, Brenda, 5,462,948, Cl. 514-323.000.
- Costanzi, Silvestro: *See—*
  - Neri, Carlo; Costanzi, Silvestro; and Angaroni, Mariangela, 5,462,984, Cl. 524-102.000.
- Cota, Glenn L.: *See—*
  - Liu, Duixian; and Cota, Glenn L., 5,463,405, Cl. 343-715.000.
- Countryman, Roger S.; and Alvarez, Jose, to Motorola, Inc. Resistorless VCO including current source and sink controlling a current controlled oscillator. 5,463,353, Cl. 331-2.000.
- Cousins, Lisa: *See—*
  - Buckley, Peter; Cousins, Lisa; Daynes, Todd; Gretxhev, Val; Hirasawa, Drake; and Leith, Graham, 5,463,219, Cl. 250-281.000.
- Covert, Charles H.; Wagner, Richard W.; Turner, Kenneth W.; and Meyer, Karen M., to General Motors Corporation. Fuel fill vapor recovery system with differential pressure control valve. 5,462,100, Cl. 141-59.000.
- Cowan, Mark: *See—*
  - Royer, Tony A.; and Cowan, Mark, 5,461,797, Cl. 33-501.700.
- Coy, David H.; and Taylor, John E., to Biomeasure, Inc.; and Tulane Educational Fund, Administrators of the. Neuromedin B receptor antagonists which demonstrate selectivity. 5,462,926, Cl. 514-16.000.
- Coy, David H.: *See—*
  - Moreau, Jacques-Pierre; and Coy, David H., 5,462,927, Cl. 514-17.000.
- Coyote Enterprises, Inc.: *See—*
  - Fuller, Russell, 5,463,371, Cl. 340-426.000.
- Crandall, Richard E., to Next Computer, Inc. Method and apparatus for public key exchange in a cryptographic system. 5,463,690, Cl. 380-30.000.
- Crane, David A.: *See—*
  - Rogers, Charles W.; Crane, David A.; and Rai, Habib G., 5,462,618, Cl. 156-161.000.
- Crawford, Mark A.: *See—*
  - LeFiles, James H.; Taylor, Evelyn J.; and Crawford, Mark A., 5,462,738, Cl. 424-409.000.
- Crawley, Graham C.: *See—*
  - Bruneau, Pierre A. R.; Crawley, Graham C.; and Oldham, Keith, 5,462,953, Cl. 514-379.000.
- Creech, David C.: *See—*
  - Curtis, Ralston; Jain, Rakesh; Creech, David C.; and Fitch, William L., 5,462,915, Cl. 504-323.000.
- Crescent Holdings Limited: *See—*
  - Pounds, Russell; and Cherry, Doyle, 5,462,721, Cl. 423-226.000.
- Cretsinger, Daniel D. Lemon slice squeezer. 5,461,969, Cl. 99-506.000.
- Crivello, James V.; and Sasaki, Hiroshi, to Rensselaer Polytechnic Institute. Photocurable silicone oxetanes. 5,463,084, Cl. 549-214.000.
- Croci, Tiziano: *See—*
  - Guzzi, Umberto; Palmieri, Costantino; and Croci, Tiziano, 5,462,945, Cl. 514-277.000.
- Crockett, Richard: *See—*
  - Plavidal, Richard W.; Nitescu, Petru N.; Mudwilder, Greg; and Crockett, Richard, 5,462,080, Cl. 137-337.000.
- Crosfield Electronics Limited: *See—*
  - MacDonald, Lindsay W.; Johnson, Anthony J.; and Luo, Ronnier, 5,463,480, Cl. 358-520.000.
- Crowley, Daniel J., Jr.: *See—*
  - Ingram, Keith W.; and Crowley, Daniel J., Jr., 5,462,184, Cl. 215-252.000.
- CRS Holding, Inc.: *See—*
  - Del Corso, Gregory J., 5,462,575, Cl. 75-243.000.
- Cseri, Istvan: *See—*
  - Anderson, Charles R.; Warfield, Robert W.; Cseri, Istvan; Low, Murray K.; Liaw, Weikuo; and Bush, Alan M., 5,463,724, Cl. 395-148.000.
- CSIR: *See—*
  - Marsh, Michael J. C.; and Hodson, Trevor M., 5,463,671, Cl. 379-56.000.
- CSL Lighting Mfg. Inc.: *See—*
  - Jones, Roy, 5,463,540, Cl. 362-260.000.
- Cuchiaro, Joseph D.: *See—*
  - De Araujo, Carlos A. P.; McMillan, Larry D.; and Cuchiaro, Joseph D., 5,463,244, Cl. 257-530.000.
- Cuddihy, Paul E.; and Shah, Rasiklal P., to General Electric Company. Method and system for analyzing error logs for diagnostics. 5,463,768, Cl. 395-183.130.
- Cuddihy, Robert V., Jr.: *See—*
  - Figh, Jack; and Cuddihy, Robert V., Jr., 5,463,209, Cl. 235-383.000.
- Cuddy, James: *See—*
  - Reid, David R.; and Cuddy, James, 5,461,814, Cl. 43-1.000.
- Culkeen, Patrick: *See—*

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Culley, Paul R., to Compaq Computer Corp. Extended duration high resolution timer contained in two integrated circuits and having alternating data sequences provided from different integrated circuits. 5,463,761, Cl. 395-550.000.

Cullinan, George J.; Singh, Jai P.; and Wood, Dan L., to Eli Lilly and Company. Methods for inhibiting vascular smooth muscle cell proliferation and restinosis. 5,462,937, Cl. 514-212.000.

Culpepper, Royce L. Golf club capable of selective angle modification between the hosel and head, and selective shaft length and method of assembling the golf club. 5,462,279, Cl. 273-164.100.

Cummings, Kasey H.; and Champion, Robert D., to Champion Containers. Recyclable lightweight pallet. 5,461,988, Cl. 108-51.300.

Curcio, M. Joan: *See—*

Garfinkel, David J.; and Curcio, M. Joan, 5,462,873, Cl. 435-254.200.

Curtis, Ralston; Jain, Rakesh; Creech, David C.; and Fitch, William L., to Sandoz Ltd. Process for producing microcapsules. 5,462,915, Cl. 504-323.000.

Cusimano, MaryRose. Integrated movement analyziing system. 5,462,065, Cl. 128-782.000.

Cutco Cutlery Corporation: *See—*

Kelley, Andrew T., 5,461,942, Cl. 73-87.000.

Cuzzato, Paolo; and Masiero, Antonio, to Ausimont S.r.l. Process for preparing 1,1,1,2-tetrafluoroethane. 5,463,151, Cl. 570-166.000.

CyberGear, Inc.: *See—*

Benjamin, Michael H.; Bobick, Aaron F.; Koselka, Harvey A.; and Ulrich, W. Thatcher, 5,462,503, Cl. 482-4.000.

Cymbal, William D., to General Motors Corporation. Position control apparatus for steering column. 5,461,937, Cl. 74-493.000.

Cytomed, Inc.: *See—*

Biftu, Tesfaye; Cai, Xiong; Hussion, Sajjet; Grewal, Gurmit; and Shen, T. Y., 5,463,083, Cl. 549-71.000.

Daewoo Electronics Co., Ltd.: *See—*

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Dahllof, Hakan: *See—*

Bergvist, Anders; and Dahllof, Hakan, 5,462,641, Cl. 162-40.000.

Dahlstrand, Monika, to Engstrom Medical Aktiebolag. Anesthetic mask for infants. 5,462,050, Cl. 128-207.180.

Dai Nippon Printing Co., Ltd.: *See—*

Takao, Shino; Kometani, Shinji; and Saito, Hitoshi, 5,462,911, Cl. 503-227.000.

Daicel Chemical Industries, Ltd.: *See—*

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Daiichi Pharmaceutical Co., Ltd.: *See—*

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Daikin Industries, Ltd.: *See—*

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Daimon, Junko; Takeda, Yasuo; and Kodama, Katsunori, to Japan Tobacco Inc.; and JT AGRIS Corp. Pot for culturing plants. 5,461,825, Cl. 47-71.000.

Daimon, Katsumi: *See—*

Nukada, Katsumi; and Daimon, Katsumi, 5,463,041, Cl. 540-139.000.

Nukada, Katsumi; Imai, Akira; Daimon, Katsumi; Iijima, Masakazu; Mashimo, Kiyokazu; Sakaguchi, Yasuo; and Takegawa, Ichiro, 5,463,043, Cl. 540-141.000.

Dainippon Ink and Chemicals, Inc.: *See—*

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Dainippon Screen Mfg., Co., Ltd.: *See—*

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D'Aleo, Michael J.; Ference, Jonathan H.; Hakkarainen, Simo P.; Spira, Joel S.; and Tucker, Darryl W., to Lutron Electronics, Co., Inc. Wall mounted programmable modular control system. 5,463,286, Cl. 315-295.000.

Daly, John W.; Spande, Thomas F.; and Garraffo, Hugo M., to United States of America, Health and Human Services. Epibatidine and derivatives, compositions and methods of treating pain. 5,462,956, Cl. 514-397.000.

Damm, Klaus; Mages, Walter J.; and Sommer, Wolfgang, to Kamax-Werke Rudolf Kellerman GmbH & Co. KG. Sound decoupling connecting element. 5,462,395, Cl. 411-107.000.

Damour, Lawrence R., to Converter Accessory Corp. Sleeve stretcher assembly for a spreader roller. 5,461,760, Cl. 26-99.000.

Dan, Jacov; and Yaron, Arieh, to Yeda Research and Development Co., Ltd. Microdelivery device and method for enhanced drug administration to the eye. 5,462,739, Cl. 424-427.000.

Dana Corporation: *See—*

Dick, Wesley M.; Reuter, David C.; and Dick, Joseph A., 5,462,496, Cl. 475-204.000.

D'Angelo, Joseph P.; Schur, Henry B.; Han, Kedu; and Glenn, Daniel J., to International Medical Associates, Inc. Integrated system for biological fluid constituent analysis. 5,462,064, Cl. 128-771.000.

Danieli United, Inc.: *See—*

Lemper, Herbert; Ellis, Robert H.; and Fabian, Richard A., 5,461,895, Cl. 72-21.000.

Daniels, Richard J.: *See—*

Rohr, Robert D.; Hess, John M.; Daniels, Richard J.; and Elliott, John, 5,462,183, Cl. 215-237.000.

Dannawi, Marwan: *See—*

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Danton, Jean-louis, to Establissments Compin. Bed or cot structure which can be retracted into a ceiling. 5,461,735, Cl. 5-10.200.

Dao, Loc H.: *See—*

Ramachandran, Ramakrishnan; and Dao, Loc H., 5,463,137, Cl. 568-454.000.

Daoust, Jacques: *See—*

Bowen, Larry; Ayres, George E.; Black, Gary; and Daoust, Jacques, 5,462,073, Cl. 131-374.000.

Daqudal, Bertrand: *See—*

Delfort, Bruno; Daqudal, Bertrand; Lallement, Jacques; Born, Maurice; Marchand, Pierre; and Hipeaux, Jean-Claude, 5,462,682, Cl. 252-18.000.

Daraktchiev, Ivan S., to OCG Microelectronic Materials, Inc. Environmentally safe dispensing assembly for ultra-pure liquid chemicals. 5,462,207, Cl. 222-148.000.

Darimont, Daniel E., to Universities Research Association, Inc. Captured key electrical safety lockout system. 5,463,196, Cl. 200-43.160.

Darling, Richard, to Eriez Manufacturing Company. Rotating drum magnetic separator. 5,462,173, Cl. 209-39.000.

Da Roit, Giovanni: *See—*

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Dasch, James: *See—*

Ogawa, Yasushi; Schmidt, David; and Dasch, James, 5,462,925, Cl. 514-12.000.

Dassanayake, N. L.: *See—*

Schlitzer, Ronald L.; Dassanayake, N. L.; and Bhatia, Rajkumar P., 5,462,713, Cl. 422-37.000.

Date, Nobuaki, to Canon Kabushiki Kaisha. Objective lens drive apparatus used in optical information recording/reproducing apparatus. 5,463,612, Cl. 369-219.000.

Datta, Madhav; and Shenoy, Ravindra V., to International Business Machines Corporation. Selective etching of TiW for C4 fabrication. 5,462,638, Cl. 156-656.100.

Daubner, John M.: *See—*

Wilson, Richard A., Jr.; Daubner, John M.; and Jeffers, Frank D., 5,463,552, Cl. 364-436.000.

Daugherty, Charles W., to Becton, Dickinson and Company. Self contained needle and shield. 5,462,533, Cl. 604-164.000.

Daugherty, David W., Jr.; Kanjo, Wajih; and Hawryszkow, Michael G., to Westinghouse Air Brake Company. Slackless drawbar assembly using a ball and race assembly at each end of the drawbar. 5,462,179, Cl. 213-62.00R.

David Samoff Research Center, Inc.: *See—*

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Davidson, Rickie L.; and Williams, Samuel R., to Timken Company, The. Compact bearing and stiffened journal. 5,462,367, Cl. 384-459.000.

Davidson Textron Inc.: *See—*

Filion, Scott M.; Frost, Colin C.; Moore, Denis L.; Roberge, Richard D.; and Yedlin, Vincent J., 5,463,258, Cl. 307-10.100.

Grimes, John A., 5,462,482, Cl. 454-143.000.

Davies, Scott T.: *See—*

Dumont, Kenneth R.; O'Neill, Andrew J.; and Davies, Scott T., 5,463,706, Cl. 385-32.000.

Davis, Donna S.: *See—*

Halle, Richard W.; Davis, Donna S.; and Harris, Charles R., Jr., 5,462,807, Cl. 428-500.000.

Davis, Glenn A.: *See—*

Massara, James M.; and Davis, Glenn A., 5,462,225, Cl. 236-47.000.

Davis, Robert E.: *See—*

Mestetsky, Pat A.; and Davis, Robert E., 5,462,607, Cl. 134-22.120.

Davis, Roland L. Internally removable safety hasp system. 5,462,320, Cl. 292-285.000.

Day, Stephen W., to WebCore Technologies, Inc. Method of production of reinforced foam cores. 5,462,623, Cl. 156-250.000.

Dayco Products, Inc.: *See—*

Rogalla, Jan N., 5,462,494, Cl. 474-135.000.

Winter, Jeffrey J.; Holden, Homer N.; and Lawrence, James L., 5,462,090, Cl. 138-121.000.

Daynes, Todd: *See—*

Buckley, Peter; Cousins, Lisa; Daynes, Todd; Gretxhev, Val; Hirasawa, Drake; and Leith, Graham, 5,463,219, Cl. 250-281.000.

De La Rue Giori S.A.: *See—*

Germann, Albrecht J., 5,461,977, Cl. 101-137.000.

De Araujo, Carlos A. P.; McMillan, Larry D.; and Cuchiaro, Joseph D., to Symetrix Corporation. Antifuse programmable element using ferroelectric material. 5,463,244, Cl. 257-530.000.

Deavenport, Joseph L.; and Lopez, Bladimir I., to Dow Chemical Company, The. Process for preparation of halohydroxypropyl-trialkylammonium halides. 5,463,127, Cl. 564-292.000.

Debouck, Christine: *See—*

Jonak, Zdenka L.; Debouck, Christine; Clark, Robert; and Trulli, Stephen, 5,462,872, Cl. 435-240.200.

Debreczeni, Joe, to Moldex Plastics & Tool Inc. Needle assembly for use with a syringe. 5,462,534, Cl. 604-192.000.

DeChellis, Marc L.: *See—*

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Decious, Gaylon M.: *See—*

Pascucci, Gregory A.; Rasmussen, David E.; Decious, Gaylon M.; Garbe, James R.; Hyzer, Susan M.; Woest, Karen L.; Vairavan, Vairavan; Koch, David L.; Gottschalk, Donald A., Jr.; Burkhardt, Dennis E.; Standish, Darrell E.; Madaus, Paul W.; Spacek, Dan J.;, 5,463,735, Cl. 395-200.100.

DeCrescenzo, Gary A.: *See—*
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DeFonzo, Stephan A.: *See—*
Bolanos, Henry; Sater, Ghaleb A.; DeFonzo, Stephan A.; and Young, Wayne P., 5,462,555, Cl. 606-120.000.

DeFranco, Robert J.: *See—*
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DeGraff, William: *See—*
Mitchell, James B.; Samuni, Amram; DeGraff, William; and Hahn, Stephen, 5,462,946, Cl. 514-315.000.

DeGree, David C., to Bergquist Company, The. Dual sided laminated semiconductor mounting. 5,463,530, Cl. 361-707.000.

Deguchi, Hiroaki; Yamashita, Masahiro; and Masuda, Yukihiro, to Sony Corporation. Solid-state image apparatus which sweeps out independently ineffective electric charges so that the exposure period can be varied within a range from one field period to one frame period. 5,463,421, Cl. 348-296.000.

Deguchi, Yuuji: *See—*
Abe, Fumio; Kondo, Tomoharu; and Deguchi, Yuuji, 5,463,206, Cl. 219-553.000.

Degussa Aktiengesellschaft: *See—*
von Wedel, Wedigo; Eickhoff, Hubertus; Weck, Manfred; Tarabocchia, John; Schelbert, Ulrich; and Möller, Alexander, 5,463,170, Cl. 588-207.000.

Dehaine, Francois: *See—*
Bracque, Gilles; Dehaine, Francois; Gourbier, Jean-Pierre; Gourdain, Daniel; Grelaud, Alain; Guillard, Alain; and Mouliney, Michel, 5,461,871, Cl. 62-24.000.

Dehne, Heinz-Wilhelm: *See—*
Scherkenbeck, Jürgen; Himmler, Thomas; Böhm, Stefan; Hagemann, Hermann; Stroech, Klaus; Dutzmann, Stefan; Dehne, Heinz-Wilhelm; and Hänssler, Gerd, 5,462,955, Cl. 514-383.000.

De Jong, Hendrikus; to Hunter Douglas International N.V. Coating sheet material. 5,462,792, Cl. 428-297.000.

De Knaep, Alfons G. M.; Moens, Luc J. R.; and Vreysen, Eduard J. C., to Janssen Pharmaceutica N.V. Process for preparing enantiomerically pure imidazo[4,5,1-JK][1,4]-benzodiazepin-2(1H)-thiones. 5,463,049, Cl. 540-556.000.

Delagera, Joseph. G-clamp. 5,462,264, Cl. 269-249.000.

De Lange, Willem J., to JTAG Technologies B.V. Control device for interface control between a test machine and multi-channel electronic circuitry, in particular according to boundary test standard. 5,463,638, Cl. 371-22.300.

Delano, James A.: *See—*
Falcoff, Allan F.; Delano, James A.; Albers, Robert E.; and Jankowski, Robert C., 5,462,601, Cl. 118-697.000.

Del Ben, Ivo: *See—*
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Delco Electronics Corp.: *See—*
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Mendez, Victor; and Hawes, Kevin J., 5,463,374, Cl. 340-442.000.
Mueller, Thomas R.; and Sylvester, Gail M., 5,463,314, Cl. 324-146.000.

Del Corso, Gregory J., to CRS Holding, Inc. Co-Cr-Mo powder metallurgy articles and process for their manufacture. 5,462,575, Cl. 75-243.000.

de Leeuw, Henricus: *See—*
van Steenbrugge, Bernard; de Leeuw, Henricus; and Mastroyiannis, Mihalis, 5,463,619, Cl. 370-58.100.

Delfer, Frank W., III: *See—*
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Delfield Company, The: *See—*
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Delfort, Bruno; Daqudal, Bertrand; Lallement, Jacques; Born, Maurice; Marchand, Pierre; and Hipeaux, Jean-Claude, to Institut Francais Du Petrole. Colloidal products containing calcium and/or magnesium, as well as sulfur and nitrogen, their preparation and their use particularly as additives in lubricating oils. 5,462,682, Cl. 252-18.000.

Dell USA, L.P.: *See—*
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Gaskins, Darius D.; and Parks, Terry J., 5,463,643, Cl. 371-40.100.
Schieve, Eric; and Finch, Richard, 5,463,766, Cl. 395-650.000.

Delphi France Automotive Systems: *See—*
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Del Tredici, Gianfranco: *See—*
Bastioli, Catia; Bellotti, Vittorio; Del Tredici, Gianfranco; Montino, Alessandro; and Ponti, Roberto, 5,462,980, Cl. 524-47.000.
Bastioli, Catia; Bellotti, Vittorio; Del Tredici, Gianfranco; and Ponti, Roberto, 5,462,981, Cl. 524-47.000.
Bastioli, Catia; Lombi, Roberto; Del Tredici, Gianfranco; and Guanella, Italo, 5,462,982, Cl. 524-47.000.

Demar, Adelbert; Ebner, Wolfgang; Meinfelder, Horst; and Köberlein, Josef, to Josef Koberlein Maschinen- und Vorrichtungsbau. Linear vibratory conveyor. 5,462,155, Cl. 198-760.000.

Demarest, Scott W.; Corba, Robert E.; Miller, Allen D.; Fritz, John M.; and Shanklin, Donald J., to S. C. Johnson & Son, Inc. System and method for pressurizing dispensing containers. 5,462,099, Cl. 141-3.000.

Deneke, Bernard F.; Rumbold, James W.; and Scott, Clark B. Installation clip device for electrical cables. 5,463,189, Cl. 174-138.00G.

Denis, Jean-Noel: *See—*
Correa, Arlene G.; Denis, Jean-Noel; and Greene, Andrew E., 5,463,106, Cl. 560-39.000.

Dennard, Robert H.; Meyerson, Bernard S.; and Rosenberg, Robert, to International Business Machines Corporation. Method of fabricating defect-free silicon on an insulating substrate. 5,462,883, Cl. 437-21.000.

Dennehey, T. Michael; Brown, Richard I.; and Williamson, Warren P., to Baxter International Inc. Peristaltic pump tube cassette for blood processing systems. 5,462,416, Cl. 417-477.200.

Den Ouden, Petronella H.: *See—*
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Denz, Peter, to Rieter Ingolstadt Spinnereimaschinenbau AG. Process and device for control of an autoleveling control frame. 5,463,556, Cl. 364-470.000.

De Plaen, Etienne: *See—*
Boon-Falleur, Thierry; van der Bruggen, Pierre; De Plaen, Etienne; Lurquin, Christophe; Traversari, Catia; Gaugler, Beatrice; and Van den Eynde, Benoit, 5,462,871, Cl. 435-240.200.

Depoe, Ronald L.; and Voshell, Sheila W., to Guilford Mills, Inc. Warp-knitted textile fabric shoe liner and method of producing same. 5,461,884, Cl. 66-170.000.

de Rooij, Nicolaas Frans; Jeanneret, Sylvain; Gass, Volker; and van der Schoot, Bart, to Universite de Neuchatel. Process for the manufacture of a micromachined device to contain or convey a fluid. 5,462,839, Cl. 430-320.000.

Desanta, Simon. Office chair having a support member for shiftably supporting a seat. 5,462,336, Cl. 297-302.400.

Desmarteau, Darryl D., to Gas Research Institute. Copolymers of tetrafluoroethylene and perfluorinated sulfonyl monomers and membranes made therefrom. 5,463,005, Cl. 526-240.000.

de Souza, Walber P.; and Moreira, José R. F., to Petroleo Brasileiro S.A.-Petrobras. Tubing hanging set for a submarine oil-well, running tool for its placing and handling method. 5,462,119, Cl. 166-348.000.

Desrosiers, Bernard; Louis, Didier; Pinchon, Didier; and Steimle, Andre, to International Business Machines Corporation. Apparatus for argument reduction in exponential computations of IEEE standard floating-point numbers. 5,463,574, Cl. 364-748.000.

Detwiler, Richard L.: *See—*
Bale Oenick, Marsha D.; Detwiler, Richard L.; Eikenberry, Jon N.; and Sutherland, John W. H., 5,462,858, Cl. 435-16.000.

Devaux, Xavier: *See—*
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Development Center for Biotechnology: *See—*
Hsieh, Jih-Han; Shih, Shu-Ching; Chi, Wei-Kuang; Chu, Yi-Ding; and Lin, Ae-Ning, 5,462,863, Cl. 435-69.300.

Devine, Michael J. Breakaway extension cord for preventing electrical plug damage. 5,462,452, Cl. 439-505.000.

DeVoe, Robert J.: *See—*
Williams, Jerry W.; DeVoe, Robert J.; Klun, Thomas P.; Vesley, George F.; and Zimmerman, Patrick G., 5,462,797, Cl. 428-345.000.

DeWachter, Gary; and Newton, John K., to Reliance Electric Industrial Company. Corrosion resistant bushing. 5,462,381, Cl. 403-365.000.

DeWitt, Jimmie E.; Holck, Timothy M.; Summers, James H.; and Emrick, Samuel L., to International Business Machines Corporation. System and method for performing monitoring of resources in a data processing system in real time. 5,463,775, Cl. 395-184.010.

Diaz, Felix V.: *See—*
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Dichtungstechnik G. Bruss GmbH & Co. KG: *See—*
Hering, Jürgen; Johnen, Rolf; and Upper, Gerd, 5,462,287, Cl. 277-37.000.
Hering, Jürgen; Johnen, Rolf; and Upper, Gerd, 5,462,288, Cl. 277-37.000.

Dick, Joseph A.: *See—*
Dick, Wesley M.; Reuter, David C.; and Dick, Joseph A., 5,462,496, Cl. 475-204.000.

Dick, Wesley M.; Reuter, David C.; and Dick, Joseph A., to Dana Corporation. Clutch actuating device for use in a vehicle drivetrain subassembly. 5,462,496, Cl. 475-204.000.

Dickerson, Ralph T. Golf grip training device. 5,462,280, Cl. 273-187.200.

Diec, Stephanie; and Karlsson, Lars G., to Telefonaktiebolaget L M Ericsson. Monitor screen graphic value indicator system. 5,463,731, Cl. 395-161.000.

Diesel Engine Retarders, Inc.: *See—*
Israel, Mark; and Fuchs, Neil E., 5,462,025, Cl. 123-321.000.

Dietz, Terry L.; and Miller, Stephen C., to Zimmer, Inc. Alignment guide and method. 5,462,550, Cl. 606-86.000.

Diez, Bruno: *See—*
Groenen, Martinus A. M.; Veenstra, Annemarie E.; Van Solingen, Pieter; Koekman, Bertus P.; Van Der Voort, Lucia H. M.; Martin, Juan F.; Gutierrez, Santiago; Diez, Bruno; Alvarez, Emilio; Barredo, Jose L.; and Esmahan, Christina, 5,462,862, Cl. 435-69.100.

- Digital Equipment Corporation: *See—*
  - Brightman, Timothy H.; Gulick, Kenneth; Hanson, Robert L.; Herrick, Brian R.; Jeffery, Edwin A.; Kozo, Maria J.; and Swanson, Carl A., 5,462,350, Cl. 312-351.700.
  - Jenness, Steven M., 5,463,774, Cl. 395-600.000.
  - Razdan, Rahul, 5,463,561, Cl. 364-489.000.
- Dijkgraaf, Jeroen T. M.: *See—*
  - Westerbeek, Johannes M. M.; Dijkgraaf, Jeroen T. M.; and Zijlmans, Joseph B. S., 5,462,759, Cl. 426-568.000.
- Diliani, Dimitri N.: *See—*
  - Vaios, Christos I.; Malinowski, Alan E.; and Diliani, Dimitri N., 5,463,681, Cl. 379-189.000.
- Dillard, Robert D.: *See—*
  - Baker, S. Richard; Dillard, Robert D.; Floreancig, Paul E.; Sawyer, J. Scott; and Sofia, Michael J., 5,462,954, Cl. 514-381.000.
- Dillon, Thomas M.; Krolopp, Robert K.; and Metroka, Michael P., to Motorola, Inc. Method for error correction of a transmitted data word. 5,463,646, Cl. 371-69.100.
- Diomed Limited: *See—*
  - Raven, Anthony, 5,463,534, Cl. 362-32.000.
- Dion, F. Eugene: *See—*
  - Morehouse, James H.; Furay, David M.; Blagaila, John; Dion, F. Eugene; Shelstad, Scott A.; and Woods, Jimmy L., 5,463,507, Cl. 360-97.020.
- DiPietro, David M.: *See—*
  - Grace, James W.; and DiPietro, David M., 5,463,315, Cl. 324-158.100.
- Di Rubbo, Salvatore R. L.: *See—*
  - Bash, Stephan R.; Di Rubbo, Salvatore R. L.; Gibilisco, Paul F.; and Mansdoerfer, Richard L., Jr., 5,463,677, Cl. 379-88.000.
- Divakaruni, Sridhar; Dreibelbis, Jeffrey H.; Ellis, Wayne F.; Furman, Anatol; and Kalter, Howard L., to International Business Machines Corporation. Power up detection circuits. 5,463,335, Cl. 327-143.000.
- Divincenzo, Gregory T.; and Gabrielson, Stefan, to Philips Electronics North America Corporation. DC-rated circuit breaker with arc suppressor. 5,463,199, Cl. 218-158.000.
- Dixon, Dale D.: *See—*
  - Pinschmidt, Robert K., Jr.; Dixon, Dale D.; Burgoyne, William F., Jr.; and Goldstein, Joel E., 5,463,007, Cl. 526-266.000.
- D'Mannco, Inc.: *See—*
  - Mann, Donaerl B., 5,462,517, Cl. 602-26.000.
- Dobrowolski, Janusz A.: *See—*
  - Wagner, Ferdinand H., 5,463,543, Cl. 364-141.000.
- Dobuzinsky, David M.: *See—*
  - Nguyen, Son V.; Dobuzinsky, David M.; Dopp, Douglas J.; and Harmon, David L., 5,462,812, Cl. 428-696.000.
- Dodak, Tony M.: *See—*
  - Tanke, Eugene T., II; and Dodak, Tony M., 5,462,132, Cl. 180-149.000.
- Dodo, Toshihiro: *See—*
  - Takase, Mitsuo; Fukuda, Nobuhiro; and Dodo, Toshihiro, 5,463,229, Cl. 257-59.000.
- Dodt, William C.; and Stroud, Robert D., to Storage Technology Corporation. Apparatus for cleaning a tape path in a tape drive. 5,463,519, Cl. 360-128.000.
- Doerr, Daniel H.: *See—*
  - Grigsby, John M.; and Doerr, Daniel H., 5,462,218, Cl. 229-23.00C.
- Doherty, Scott W. Apparatus for retrieving baseballs. 5,462,326, Cl. 294-1.100.
- Doi, Kunio: *See—*
  - Asada, Naoki; and Doi, Kunio, 5,463,548, Cl. 364-413.020.
- Doi, Toshiya; Ozawa, Takeshi; Tanaka, Kazuhide; Yuasa, Toyotaka; Kamo, Tomoichi; and Matsuda, Shinpei, to Hitachi, Ltd. Superconductive material, a superconductive body, and a method of forming such a superconductive material or body. 5,462,922, Cl. 505-785.000.
- Doi, Yukio; Zhang, Wei-Zhong; Ishitani, Koichi; and Kinugasa, Masayoshi, to Showa Highpolymer Co., Ltd. Silicone copolymer emulsion. 5,462,988, Cl. 524-501.000.
- Dolan, Michael J.: *See—*
  - Lippman, Jerome; Dolan, Michael J.; Sullivan, John J., Jr.; and Viscovitz, John H., 5,462,688, Cl. 252-89.100.
- Dolby Laboratories Licensing Corporation: *See—*
  - Dressler, Roger W., 5,463,424, Cl. 348-485.000.
- Dolence, Eric K.: *See—*
  - Hu, Chen-Ze; Dolence, Eric K.; Osaki, Shigemasa; and Sanders, Clifton G., 5,463,010, Cl. 528-25.000.
- Dolfinger, Frank, Jr.: *See—*
  - Sudhakar, Chakka; Dolfinger, Frank, Jr.; Cesar, Max R.; Patel, Mahendra S.; and Fritz, Paul O., 5,462,651, Cl. 208-143.000.
- Dolgin, Stuart. Surgical snare with a frangible loop. 5,462,553, Cl. 606-113.000.
- Dolle, Roland E.; Graybill, Todd L.; Speier, Gary J.; Prouty, Catherine P.; and Schmidt, Stanley J., to Sterling Winthrop Inc. Peptidic ketones as interleukin-1β-converting enzyme inhibitors. 5,462,939, Cl. 514-231.500.
- Dombrowski, David: *See—*
  - Halaburda, Daniel J.; Dombrowski, David; and Valls, William H., 5,462,161, Cl. 206-705.000.
- Donatelli, Joseph M., Jr., to Wiand, Ronald C. Stone polishing composition. 5,462,568, Cl. 51-309.000.
- Dong Kook Pharmaceutical Co., Ltd.: *See—*
  - Cho, Jung H.; Oh, Chang H.; and Nam, Ki H., 5,463,046, Cl. 540-350.000.
- Donnelly, James N. Curtain apparatus. 5,461,763, Cl. 29-81.080.
- Donnerstag, Leonard, deceased; and Donnerstag, Rory, executor, to Siemens Energy & Automation, Inc. Variable depth load center enclosure. 5,463,533, Cl. 361-825.000.
- Donnerstag, Rory, executor: *See—*
  - Donnerstag, Leonard, deceased; and Donnerstag, Rory, executor, 5,463,533, Cl. 361-825.000.
- Donovan, John W.; and Lavieri, Frank P., to Hoechst Celanase Corporation. Fiber reactive monoazo yellow dye. 5,463,033, Cl. 534-642.000.
- Donwen, Roger P. Billiard cue with improved tip configuration. 5,462,490, Cl. 473-49.000.
- Doolittle, Miles G.; and Zielesch, Paul A., to Dura Mechanical Components, Inc. Common shifter and parking brake mounting. 5,462,146, Cl. 192-4.00A.
- Dopp, Douglas J.: *See—*
  - Nguyen, Son V.; Dobuzinsky, David M.; Dopp, Douglas J.; and Harmon, David L., 5,462,812, Cl. 428-696.000.
- DORMA GmbH + Co. KG: *See—*
  - Tillmann, Horst; Jentsch, Dietrich; Hering, Thomas; Warschewitz, Thomas; Sichelschmidt, Dieter; and Winkler, Bernd, 5,461,754, Cl. 16-82.000.
- Dorward, Sean M.; Jayant, Nuggehally S.; Johnston, James D.; Quackenbush, Schuyler R.; Seshadri, Nambirajan; and Sundberg, Carl-Erik W., to AT&T IPM Corp. Tailored error protection. 5,463,641, Cl. 371-374.000.
- Doryokuro Kakunenryo Kaihatsu Jigyodan: *See—*
  - Kobuke, Yoshiaki; Togashi, Akio; Ozawa, Masaki; and Watanabe, Masayuki, 5,463,099, Cl. 556-117.000.
- Doskocil Manufacturing Co. Inc.: *See—*
  - Murphy, Thomas B., 5,462,015, Cl. 119-19.000.
- Dow Chemical Company, The: *See—*
  - Deavenport, Joseph L.; and Lopez, Bladimir I., 5,463,127, Cl. 564-292.000.
  - Earls, Jimmy D.; Hefner, Robert E., Jr.; and Puckett, Paul M., 5,463,091, Cl. 549-560.000.
  - Kiefer, Garry E.; and Kim, Won D., 5,462,725, Cl. 424-9.363.
  - Lo, Grace Y.; and Gatzke, Arnold L., 5,462,994, Cl. 525-314.000.
  - Lysenko, Zenon; and Pews, Richard G., 5,463,129, Cl. 564-423.000.
  - Ward, Dennis M.; Aerts, Ronny A. W.; Meijer, Jean-Pierre; Arnswald, Silke; Sandoval, Gerald A.; and Schneemann, Herbert, 5,463,555, Cl. 364-468.000.
  - Wehmeyer, Richard M.; Walters, Marlin E.; Tasset, Emmett L.; and Brewster, Steven L., 5,463,140, Cl. 568-727.000.
- Dow Corning Corporation: *See—*
  - Greenleaf, Suzanne M.; and Cifuentes, Martin E., 5,462,587, Cl. 106-2.000.
- Dowa Mining Co., Ltd.: *See—*
  - Onoue, Takashi; Araki, Kiyoshi; Ishida, Noriya; Kitamura, Toshiya; Niitsu, Yasuhiko; Yanagisawa, Makiko; Sakamoto, Ryo; and Sato, Fumihiro, 5,462,821, Cl. 429-218.000.
- Dowbrands L.P.: *See—*
  - Engler, Steven J., 5,462,727, Cl. 424-45.000.
- DowElanco: *See—*
  - Cassell, Ronald L., 5,461,824, Cl. 47-57.500.
- Downey, Walter J.: *See—*
  - Sutterlin, Philip H.; Downey, Walter J.; Chui, Benjamin W.; Stewart, J. Marcus; and Hurlbut, Amy O., 5,463,662, Cl. 375-351.000.
- Dr. Karl Thomae GmbH: *See—*
  - Himmelsbach, Frank; Linz, Guenter; Austel, Volkhard; Pieper, Helmut; Mueller, Thomas; Weisenberger, Johannes; and Seewaldt-Becker, Elke, 5,463,071, Cl. 548-251.000.
- Draper, Richard W.: *See—*
  - Hou, Donald; Draper, Richard W.; Lee, Gary M.; Mas, Janet L.; and Mergelsberg, Ingrid, 5,463,051, Cl. 540-576.000.
- Dreibelbis, Jeffrey H.: *See—*
  - Divakaruni, Sridhar; Dreibelbis, Jeffrey H.; Ellis, Wayne F.; Furman, Anatol; and Kalter, Howard L., 5,463,335, Cl. 327-143.000.
- Dreier, Richard L.: *See—*
  - Abbey, Nelson D., III; Dreier, Richard L.; and Taber, Susan J., 5,461,896, Cl. 72-181.000.
- Dresdner, Michael M.; and Headman, Robert K., to C. F. Martin & Company, Inc. Acoustic guitar assembly. 5,461,958, Cl. 84-267.000.
- Dressler, Roger W., to Dolby Laboratories Licensing Corporation. Multichannel transmitter/receiver system providing matrix-decoding compatible signals. 5,463,424, Cl. 348-485.000.
- Dressler, William E. Combined ambient-air and earth exchange heat pump system. 5,461,876, Cl. 62-160.000.
- Driggs, Leland W. Low friction baler liner. 5,461,975, Cl. 100-188.00R.
- Driscoll, Mary E.; and Taub, Karl D., to W. R. Grace & Co.-Conn. Aggregate producing machine. 5,462,235, Cl. 241-30.000.
- Drug Delivery System Institute, Ltd.: *See—*
  - Inoue, Kazuhiro; Ito, Teruomi; Okuno, Satoshi; and Aono, Katsutoshi, 5,463,022, Cl. 530-322.000.
- Drumheller, Paul D.: *See—*
  - Hubbell, Jeffrey A.; Elbert, Donald; Hill-West, Jennifer L.; Drumheller, Paul D.; Chowdhury, Sanghamitra; and Sawhney, Amarpreet, 5,462,990, Cl. 525-54.100.
- DSC Communications Corporation: *See—*
  - Hogg, Raymond L.; and Diaz, Felix V., 5,463,624, Cl. 370-85.600.
- DSP Semiconductors Ltd: *See—*
  - Wertheizer, Gideon; Be'ery Yair; Ovadia, Bat-Sheva; Gross, Yael; Perets, Ronen; and Milstein, Yakov, 5,463,749, Cl. 395-437.000.
- DSP Semiconductors USA, Inc.: *See—*

  - Wertheizer, Gideon; Be'ery Yair; Ovadia, Bat-Sheva; Gross, Yael; Perets, Ronen; and Milstein, Yakov, 5,463,749, Cl. 395-437.000.
- Du Pont de Nemours, E. I., and Company: *See—*
  - Falcoff, Allan F.; Delano, James A.; Albers, Robert E.; and Jankowski, Robert C., 5,462,601, Cl. 118-697.000.
  - Manring, Lewis E.; and West, Michael W. J., 5,463,182, Cl. 525-330.400.
  - Rao, V N. Mallikarjuna, 5,463,152, Cl. 570-176.000.
- Du Pont Merck Pharmaceutical Company, The: *See—*
  - Fevig, John M.; Abelman, Matthew M.; Amparo, Eugene C.; Cacciola, Joseph; Kettner, Charles A.; Pacofsky, Gregory J.; and Wang, Chia-Lin, 5,462,964, Cl. 514-423.000.
- Dubler, Robert E.: *See—*
  - Wang, Nai-Yi; Dubler, Robert E.; Ungemach, Frank S.; Walters, Roland L.; and Thacker, Susan A., 5,463,027, Cl. 530-388.900.
- Duboc, Robert M., Jr.: *See—*
  - Macaulay, John M.; Searson, Peter C.; Duboc, Robert M., Jr.; and Spindt, Christopher J., 5,462,467, Cl. 445-50.000.
- Dubreuil, Didier: *See—*
  - Bischoff, Erwin; Gao, Zhan; Wohlfeil, Stefan; Hecker, Gabriele; Cleophax, Jeannine; Dubreuil, Didier; Gero, Stéphane; Olesker, Alice; Verre-Sebrie, Catherine; Vieira de Almeida, Mauro; and Vass, Georges, 5,463,087, Cl. 549-336.000.
- Dulebohn, Joel I.: *See—*
  - Berglund, Kris A.; Dulebohn, Joel I.; and Torgerson, Beatrice A., 5,462,878, Cl. 436-131.000.
- Dumarot, Daniel P.; and Garcia, Armando, to International Business Machines Corporation. High-performance, multi-bank global memory card for multiprocessor systems. 5,463,755, Cl. 395-475.000.
- Dumont, Kenneth R.; O'Neill, Andrew J.; and Davies, Scott T., to Thomas & Betts Corporation. Light traceable transmission conduit assembly. 5,463,706, Cl. 385-32.000.
- Duncan, John A.: *See—*
  - Wiedner, Guenther; Duncan, John A.; and Patel, Suresh R., 5,461,724, Cl. 2-2.000.
- Dunn, Daniel S.; and Augustin, Eugene P. Multiple channel microwave rotary polarizer. 5,463,358, Cl. 333-1.000.
- Dunn, Joseph T.; and Waugh, Stephen M., to Immunex Corporation. Purification of fusion proteins comprising GM-CSF and IL-3. 5,463,029, Cl. 530-416.000.
- Du Parc, Jacques; Glinski, Christophe; and Wursteisen, Michel, to Cegelec Metals Systems. Power converter device for direct current power supply to an electric arc furnace. 5,463,653, Cl. 373-108.000.
- Duphar International Research B.V.: *See—*
  - Hartog, Jan; Van Steen, Bartholomeus J.; Mos, Johannes; and Schipper, Jacques, 5,462,942, Cl. 514-254.000.
  - Ten Hoeve, Wolter; Thiecke, Jantje R. G.; Wynberg, Hans; and Kruse, Chris G., 5,463,050, Cl. 540-575.000.
- Dupuy, Ronald E., to GenCorp Inc. Glass run guide for slidable vehicle window. 5,461,830, Cl. 49-449.000.
- Dura Mechanical Components, Inc.: *See—*
  - Doolittle, Miles G.; and Zielesch, Paul A., 5,462,146, Cl. 192-4.00A.
- Durante, Vincent A.: *See—*
  - Resasco, Daniel E.; Marcus, Bonita K.; Huang, Chen-Shi; and Durante, Vincent A., 5,462,904, Cl. 502-222.000.
- Durchschlag, Gerald, to VAE Eisenbahnststeme Aktiengesellschaft. Apparatus for locking moveable switch parts. 5,462,245, Cl. 246-448.000.
- Duret, Denis, to Commissariat a l'Energie Atomique. Differential resonance magnetometer. 5,463,318, Cl. 324-301.000.
- During, Niclas; and Weinl, Gerold, to Sandvik AB. Sintered carbonitride alloy and method of producing. 5,462,574, Cl. 75-238.000.
- Durth, Wilfried, to Rational GmbH. Arrangement for an air supply of a radial fan or blower. 5,462,404, Cl. 415-183.000.
- Dussan V., Elizabeth B.; Auzerais, François M.; and Anderson, Barbara I., to Schlumberger Technology Corporation. Method and apparatus for determining permeability of subsurface formations. 5,463,549, Cl. 364-422.000.
- Dutzmann, Stefan: *See—*
  - Scherkenbeck, Jürgen; Himmler, Thomas; Böhm, Stefan; Hagemann, Hermann; Stroech, Klaus; Dutzmann, Stefan; Dehne, Heinz-Wilhelm; and Hänssler, Gerd, 5,462,955, Cl. 514-383.000.
  - Seitz, Thomas; Klausener, Alexander; Berg, Dieter; Wachendorff-Neumann, Ulrike; Erdelen, Christoph; Hänssler, Gerd; Brandes, Wilhelm; and Dutzmann, Stefan, 5,462,943, Cl. 514-256.000.
- Dwivedi, Anurag: *See—*
  - Balcar, Gerald P.; and Dwivedi, Anurag, 5,462,570, Cl. 65-17.100.
- Dyer, John A.: *See—*
  - Peek, Gregory A.; Lytle, William B.; and Dyer, John A., 5,462,380, Cl. 403-329.000.
- Dygert, Douglas M.; and Radcliffe, Clifford B., to Ring Can Corporation. Composite package for hazardous materials. 5,462,169, Cl. 206-521.000.
- Dyko Industriekeramik GmbH: *See—*
  - Goerenz, Edmund, 5,462,616, Cl. 156-85.000.
- Dylec Ltd.: *See—*
  - Bauer, Heinz, 5,463,375, Cl. 340-517.000.
- E. R. Squibb & Sons, Inc.: *See—*
  - Godfrey, Jollie D., Jr.; Mueller, Richard H.; Sedergran, Thomas C.; and Soundararajan, Nachimuthu, 5,463,059, Cl. 546-21.000.
- E-Systems, Inc.: *See—*
  - Ingram, Paul M., Jr.; Johnson, James R.; and Givens, Fenton L., 5,462,357, Cl. 374-124.000.
  - Wall, Angela M., 5,463,404, Cl. 343-700.0MS.
- Eachus, Raymond S.: *See—*
  - Kuromoto, Traci Y.; Bell, Eric L.; McDugle, Woodrow G.; Eachus, Raymond S.; Puckett, Sherrill A.; Olm, Myra T.; and Wilson, Robert D., 5,462,849, Cl. 430-567.000.
- Earls, Jimmy D.; Hefner, Robert E., Jr.; and Puckett, Paul M., to Dow Chemical Company, The. Diglycidyl ether of 4,4'-dihydroxy-α-methylstilbene. 5,463,091, Cl. 549-560.000.
- Eastman, Alan D., to Phillips Petroleum Company. Alkylation catalyst regeneration. 5,463,162, Cl. 585-724.000.
- Eastman Kodak Company: *See—*
  - Bale Oenick, Marsha D.; Detwiler, Richard L.; Eikenberry, Jon N.; and Sutherland, John W. H., 5,462,858, Cl. 435-16.000.
  - Campbell, Dean B.; and Korytkowski, Henry M., 5,463,429, Cl. 348-128.000.
  - Kuromoto, Traci Y.; Bell, Eric L.; McDugle, Woodrow G.; Eachus, Raymond S.; Puckett, Sherrill A.; Olm, Myra T.; and Wilson, Robert D., 5,462,849, Cl. 430-567.000.
  - Merkel, Paul B.; and Singer, Stephen P., 5,462,848, Cl. 430-546.000.
  - Michal, Vratislav M., 5,461,831, Cl. 52-1.000.
  - Morse, Theodore H.; Rimai, Donald S.; Potucek, Martin; and Sonnenberg, Sven, 5,463,449, Cl. 355-203.000.
  - Romano, Charles E., Jr.; Edwards, Larry D.; and Hibbs, Richard E., 5,462,842, Cl. 430-503.000.
  - Servant, Jeanne D.; and Baumlin, Jean-Marie, 5,462,598, Cl. 118-324.000.
  - Tyagi, Dinesh; and Sorriero, Louis J., 5,462,829, Cl. 430-109.000.
  - Wehl, Wolfgang, 5,463,411, Cl. 347-65.000.
  - Wilson, James; and Altrieth, Frederick E., 5,463,448, Cl. 355-202.000.
  - Zander, Dennis R., 5,463,439, Cl. 354-288.000.
- Eberhard, Jeffrey W.; and Tam, Kwok C., to General Electric Company. Helical and circle scan region of interest computerized tomography. 5,463,666, Cl. 378-4.000.
- Ebner, Wolfgang: *See—*
  - Demar, Adelbert; Ebner, Wolfgang; Meinfelder, Horst; and Köberlein, Josef, 5,462,155, Cl. 198-760.000.
- EC Engineering + Consulting Spezialmaschinen GmbH: *See—*
  - Kaspar, Ernst, 5,462,083, Cl. 137-580.000.
- Echelon Corporation: *See—*
  - Sutterlin, Philip H.; Downey, Walter J.; Chui, Benjamin W.; Stewart, J. Marcus; and Hurlbut, Amy O., 5,463,662, Cl. 375-351.000.
- Echigo, Katsuhiro: *See—*
  - Kurotori, Tsuneo; Echigo, Katsuhiro; Urakawa, Mitsuaki; Mizuno, Hisamitsu; and Hibi, Kunio, 5,463,447, Cl. 355-202.000.
  - Kurotori, Tsuneo; Mochizuki, Manabu; Ariyama, Kenzo; Kojima, Kenji; Tsuruoka, Ichiro; Echigo, Katsuhiro; Miyao, Mayumi; and Ikeda, Itsuo, 5,463,453, Cl. 355-256.000.
- Echigo, Yoshiaki: *See—*
  - Tomioka, Isao; Nakano, Takeshi; Furukawa, Mikio; and Echigo, Yoshiaki, 5,463,016, Cl. 528-353.000.
- Eckel, Hans-Gerd; Kunkel, Anja; and Müller, Michael, to Firma Carl Freudenberg. Switchable hydraulically damping mount. 5,462,261, Cl. 267-140.130.
- Eckenhoff, James B.: *See—*
  - Carr, John P.; Larsen, Steven D.; and Eckenhoff, James B., 5,462,741, Cl. 424-438.000.
- Eckert, C. Edward. Method for molten metal treatment. 5,462,580, Cl. 75-678.000.
- Eckert, C. Edward. Method for treating molten metal. 5,462,581, Cl. 75-678.000.
- Eckert, C. Edward. Liquid waste oxygenation. 5,463,176, Cl. 210-622.000.
- Eckhardt, Claude; and Reinehr, Dieter, to Ciba-Geigy Corporation. Inhibition of re-absorption of migrating dyes in the wash liquor. 5,462,564, Cl. 8-111.000.
- Ecolab, Inc.: *See—*
  - Gutzmann, Timothy A.; and Altier, Mark R., 5,462,681, Cl. 252-11.000.
- Ecole Polytechnique Federale de Lausanne, (EPFL): *See—*
  - Graetzel, Michael; and Nazeeruddin, Mohammad K., 5,463,057, Cl. 546-4.000.
- Edelson, Richard L.; and Gasparro, Francis P., to Yale University. Immune system modulation using psoralens activated with visible light. 5,462,733, Cl. 424-93.710.
- Edmunds, Colin R.: *See—*
  - French, James C.; Edmunds, Colin R.; McDonnell, Peter; and Showalter, Howard D. H., 5,463,035, Cl. 536-55.300.
- Edstroem, Rolf: *See—*
  - Eriksson, Sture; and Edstroem, Rolf, 5,461,911, Cl. 73-201.000.
- Edwards, Charles L., Jr. Pecan cracker. 5,461,970, Cl. 99-575.000.
- Edwards, Larry D.: *See—*
  - Romano, Charles E., Jr.; Edwards, Larry D.; and Hibbs, Richard E., 5,462,842, Cl. 430-503.000.
- Effa, Gerald I. Cover for a tray jack. 5,462,103, Cl. 150-154.000.
- Egami, Akira; and Ehira, Masaya, to Kabushiki Kaisha Kobe Seiko Sho. Cermet sintered body. 5,462,901, Cl. 501-87.000.
- Ehira, Masaya: *See—*
  - Egami, Akira; and Ehira, Masaya, 5,462,901, Cl. 501-87.000.
- Eick, Edward C.: *See—*
  - Meisenburg, Gary L.; Eick, Edward C.; Magee, Phillip D.; Mixon, Charles M.; Weronke, Robert B.; Shields, Waylon D.; Smith, Woody R.; and Pavey, Steven J., 5,462,463, Cl. 440-80.000.
- Eickhoff, Hubertus: *See—*

von Wedel, Wedigo; Eickhoff, Hubertus; Weck, Manfred; Tarabocchia, John; Schelbert, Ulrich; and Möller, Alexander, 5,463,170, Cl. 588-207.000.

Eickholt, Hubert: *See—*

Patzelt, Norbert; Blasczyk, Gotthard; and Eickholt, Hubert, 5,462,234, Cl. 241-19.000.

Eidam, Herbert: *See—*

Jung, Udo; Eidam, Herbert; and Gerk, Wilhelm, 5,462,484, Cl. 454-187.000.

Eidam, Manfred; Flanhardt, Michael; Rauschenbach, Stefan; and Roth, Andreas, to GKN Walterscheid GmbH. Device for attaching an agricultural implement to a tractor. 5,462,131, Cl. 180-14.400.

Eikenberry, Jon N.: *See—*

Bale Oenick, Marsha D.; Detwiler, Richard L.; Eikenberry, Jon N.; and Sutherland, John W. H., 5,462,858, Cl. 435-16.000.

Eisai Co., Ltd.: *See—*

Hayashi, Kenji; Watanabe, Nobuhisa; Nose, Koichi; Tanaka, Hiroshi; Ohtsuka, Issei; Kokushi, Motoji; Hiyoshi, Hironobu; Kobayashi, Hiroko; Yamada, Toshie; and Horie, Toru, 5,462,958, Cl. 514-399.000.

Nakamura, Yusuke; and Sato, Takaaki, 5,463,026, Cl. 530-387.900.

Eischeid, Karl. Drilling apparatus for producing drilled holes with undercuts. 5,462,393, Cl. 408-159.000.

Ekholm, Rolf: *See—*

Jansson, Ulf; and Ekholm, Rolf, 5,461,888, Cl. 68-181.00R.

ELA Medical, S.A.: *See—*

Jacobson, Peter; Kroiss, Daniel; and Henry, Christine, 5,462,060, Cl. 128-702.000.

Elbert, Donald: *See—*

Hubbell, Jeffrey A.; Elbert, Donald; Hill-West, Jennifer L.; Drumheller, Paul D.; Chowdhury, Sanghamitra; and Sawhney, Amarpreet, 5,462,990, Cl. 525-54.100.

Electra Form, Inc.: *See—*

Bright, Stephen A., 5,462,180, Cl. 215-12.100.

Electronics and Telecommunications Research Institute: *See—*

Kim, Jin-Up; and Kim, Sun-Young, 5,463,571, Cl. 364-746.200.

Kim, Jin-Up; and Kim, Sun-Young, 5,463,572, Cl. 364-746.200.

Electroplating Technologies, Inc.: *See—*

Keeney, Harold M.; Van Anglen, Erik S.; and Forand, James L., 5,462,649, Cl. 205-93.000.

El-Hamamsy, Sayed-Amr, to General Electric Company. Variable capacitor with very fine resolution. 5,463,285, Cl. 315-248.000.

Eli Lilly and Company: *See—*

Baker, S. Richard; Dillard, Robert D.; Floreancig, Paul E.; Sawyer, J. Scott; and Sofia, Michael J., 5,462,954, Cl. 514-381.000.

Cullinan, George J.; Singh, Jai P.; and Wood, Dan L., 5,462,937, Cl. 514-212.000.

Flaugh, Michael E.; and Foreman, Mark M., 5,462,962, Cl. 514-411.000.

Fontana, Steven A., 5,462,950, Cl. 514-324.000.

Jones, Charles D.; and Tinsley, Frank C., 5,462,949, Cl. 514-324.000.

Misner, Jerry W., 5,463,060, Cl. 546-68.000.

Elko, David A.; Frey, Jeffrey A.; Helffrich, Audrey A.; Isenberg, John F., Jr.; Moore, Brian B.; Nick, Jeffery M.; Swanson, Michael D.; and Williams, Joseph A., to International Business Machines Corporation. Coupling facility for receiving commands from plurality of hosts for activating selected connection paths to I/O devices and maintaining status thereof. 5,463,736, Cl. 395-848.000.

Elkus, Robert M., to Henry Ford Hospital. Suture passer and method of using. 5,462,562, Cl. 606-148.000.

Ellingson, David I.; Michael, Daryl A.; and Nelms, William M., to Maytag Corporation. Dishwasher utensil tray. 5,462,348, Cl. 312-301.000.

Elliott, John: *See—*

Rohr, Robert D.; Hess, John M.; Daniels, Richard J.; and Elliott, John, 5,462,183, Cl. 215-237.000.

Elliott, Randy D.: *See—*

Arends, Thomas C.; and Elliott, Randy D., 5,463,211, Cl. 235-462.000.

Ellis, Marion E., to Delco Electronics Corp. Method for forming thick film resistors and compositions therefor. 5,463,367, Cl. 338-308.000.

Ellis, Robert H.: *See—*

Lemper, Herbert; Ellis, Robert H.; and Fabian, Richard A., 5,461,895, Cl. 72-21.000.

Ellis, Wayne F.: *See—*

Divakaruni, Sridhar; Dreibelbis, Jeffrey H.; Ellis, Wayne F.; Furman, Anatol; and Kalter, Howard L., 5,463,335, Cl. 327-143.000.

Elslager, Edward F.; and Gogliotti, Rocco D., to Warner-Lambert Company. Arylthio compounds. 5,463,122, Cl. 564-82.000.

Eltoukhy, Atef H.: *See—*

Teng, Edward; and Eltoukhy, Atef H., 5,462,796, Cl. 428-336.000.

Emerson Electric Co.: *See—*

Hill, Jason J., 5,461,935, Cl. 74-424.80R.

Emigh, Jonathan D.: *See—*

Clupper, Charles B.; Emigh, Jonathan D.; Mulkey, Steven L.; Fehringer, Robert L.; Flickner, Brett J.; Saldana, Daniel M.; and Delfer, Frank W., III, 5,462,399, Cl. 414-790.300.

Emit Seiko Co., Ltd.: *See—*

Terao, Kazuhiko; Iida, Hidetoku; Nakayama, Takeyasu; Kubo, Toshiya; Horigome, Jiro; Matsuoka, Yoshihiro; Takeda, Nobutoshi; and Mizuhashi, Tohru, 5,463,709, Cl. 385-85.000.

Emory University: *See—*

Berry, Arnold J., 5,462,163, Cl. 206-370.000.

Emrick, Samuel L.: *See—*

DeWitt, Jimmie E.; Holck, Timothy M.; Summers, James H.; and Emrick, Samuel L., 5,463,775, Cl. 395-184.010.

Endo, Tunehiro: *See—*

Futami, Motoo; Endo, Tunehiro; Notohara, Yasuo; and Kitayama, Tooru, 5,463,299, Cl. 318-618.000.

Endou, Kouhei: *See—*

Chujo, Takao; Hamano, Hisashi; Nishiyama, Masanori; Saeki, Yasuhiro; Ogawa, Tatsuya; and Endou, Kouhei, 5,463,015, Cl. 528-308.200.

Energy Conversation Partnership, Ltd.: *See—*

Johnson, Arthur F., 5,461,858, Cl. 60-325.000.

Energy Life System Corporation: *See—*

Saksena, Sanjeev; Sulek, Stanislaw; and Hussein, Hany M. G., 5,462,544, Cl. 606-15.000.

Eng, Kan K.: *See—*

Askin, David; Eng, Kan K.; and Volante, Ralph P., 5,463,067, Cl. 548-113.000.

Engel Industries, Inc.: *See—*

McClain, Lamont R., 5,462,089, Cl. 138-109.000.

Engelhard Corporation: *See—*

Farrauto, Robert J.; Voss, Kenneth E.; and Heck, Ronald M., 5,462,907, Cl. 502-304.000.

Engelson, Erik T.: *See—*

Samson, Gene; Engelson, Erik T.; Chee, Hiram; and Woodard, Robert E., 5,462,523, Cl. 604-30.000.

Engle, Thomas H., to Knorr Brake Holding Corp. Latchmaster sliding pull up hitch. 5,462,394, Cl. 410-59.000.

Engler, Steven J., to Dowbrands L.P. Composition for inhibition of corrosion in galvanized steel cans. 5,462,727, Cl. 424-45.000.

Engstrom Medical Aktiebolag: *See—*

Dahlstrand, Monika, 5,462,050, Cl. 128-207.180.

Enichem Elastomeres France S.A.: *See—*

Storet, Isabelle, 5,463,153, Cl. 570-227.000.

Enichem Synthesis S.p.A.: *See—*

Neri, Carlo; Costanzi, Silvestro; and Angaroni, Mariangela, 5,462,984, Cl. 524-102.000.

Enoki, Masatoshi; Tokunaga, Osamu; Yamato, Shinichi; and Imazono, Masahiko, to Toto Ltd. Hot and cold water mixing discharge device. 5,462,224, Cl. 236-12.130.

Enscore, David J.; Campbell, Patricia S.; Osborne, James L.; Smart, Melinda K.; and Yum, Su I., to Alza Corporation. Subsaturated transdermal therapeutic system having improved release characteristics. 5,462,745, Cl. 424-448.000.

Ensuiko Sugar Refining Co., Ltd.: *See—*

Hara, Koji; Fujita, Koki; Kuwahara, Nobuhiro; Kitahata, Sumio; and Koizumi, Kyoko, 5,463,039, Cl. 536-124.000.

Envirowaste Systems, Inc.: *See—*

Pitts, John, 5,462,676, Cl. 210-774.000.

Epstein, Arthur J.; Roe, Mitchell G.; Ginder, John M.; Hajiseyedjavadi, Hamid; and Joo, Jinsoo, to Ohio State University Research Foundation, The. Electromagnetic radiation absorbers and modulators comprising polyaniline. 5,463,014, Cl. 528-210.000.

Epworth, Richard E., to Northern Telecom Limited. Optical transmission system. 5,463,487, Cl. 359-124.000.

Erceg, Frank M.: *See—*

Chiu, Tzu-Yin; Erceg, Frank M.; Krafty, Francis A.; Liu, Te-Yin M.; Possanza, William A.; and Sung, Janmye, 5,462,888, Cl. 437-57.000.

Erdelen, Christoph: *See—*

Fischer, Reiner; Bretschneider, Thomas; Krüger, Bernd-Wieland; Erdelen, Christoph; Santel, Hans-Joachim; Lürssen, Klaus; Schmidt, Robert R.; Wachendorff-Neumann, Ulrike; and Stendel, Wilhelm, 5,462,913, Cl. 504-138.000.

Seitz, Thomas; Klausener, Alexander; Berg, Dieter; Wachendorff-Neumann, Ulrike; Erdelen, Christoph; Hänssler, Gerd; Brandes, Wilhelm; and Dutzmann, Stefan, 5,462,943, Cl. 514-256.000.

Eriez Manufacturing Company: *See—*

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Eriksson, Sture; and Edstroem, Rolf, to Siemens Elema AB. Flow transducer muff. 5,461,911, Cl. 73-201.000.

Esaki, Toshiro; Suzuki, Mituru; Sato, Susumu; Takahashi, Kohichi; and Shimizu, Makoto, to Fuji Photo Film Co., Ltd. Photographic film cassette and method of assembling the photographic film cassette. 5,462,240, Cl. 242-348.100.

Esmahan, Christina: *See—*

Groenen, Martinus A. M.; Veenstra, Annemarie E.; Van Solingen, Pieter; Koekman, Bertus P.; Van Der Voort, Lucia H. M.; Martin, Juan F.; Gutierrez, Santiago; Diez, Bruno; Alvarez, Emilio; Barredo, Jose L.; and Esmahan, Christina, 5,462,862, Cl. 435-69.100.

Esselmann, Dennis. Label dispensing sheet. 5,462,783, Cl. 428-40.000.

Establissments Compin: *See—*

Danton, Jean-louis, 5,461,735, Cl. 5-10.200.

Eta SA Fabriques d'Ebauches: *See—*

Pache, Rémy, 5,463,383, Cl. 340-825.440.

ETP Transmission AB: *See—*

Samelius, Anders; Ohlson, Björn; and Lindström, Stefan, 5,462,293, Cl. 279-4.030.

Europcopter France: *See—*

Coffy, René L., 5,462,408, Cl. 416-134.00A.

Evans, Christopher M.; Buckingham, Mark R.; and Norman, Colin F., to Minnesota Mining and Manufacturing Company. Magnetic recording materials provided with a photosensitive layer. 5,462,823, Cl. 430-14.000.

Evans, Mark D.: *See—*

  - Monteleone, Michael G.; Weiss, Richard A.; Evans, Mark D.; and Hanna, Marie R., 5,462,923, Cl. 512-19.000.
- Evenstad, Kenneth L.; O'Neill, Victoria A.; and Gorham, Thomas R., to Athena Neurosciences, Inc. Rectally-administered, epileptic-seizure-inhibiting composition. 5,462,740, Cl. 424-436.000.
- Ever-Success Development Co., Ltd.: *See—*
  - Kok, Tat C., 5,461,795, Cl. 33-483.000.
- Evercorn, Inc.: *See—*
  - Bloembergen, Steven; and Narayan, Ramani, 5,462,983, Cl. 524-51.000.
- Everest Medical Corporation: *See—*
  - Rydell, Mark A., 5,462,546, Cl. 606-51.000.
- Eversoll, Earl K. Spare tire mounted container carrier. 5,462,211, Cl. 224-42.140.
- Exley, Timothy R.: *See—*
  - Ladina, Joseph M.; Exley, Timothy R.; and Szedon, William A., 5,462,186, Cl. 215-330.000.
- Extraction Systems, Inc.: *See—*
  - Kinkead, Devon A., 5,462,485, Cl. 454-256.000.
- Exxon Chemical Patents Inc.: *See—*
  - Griffin, John R.; DeChellis, Marc L.; and Muhle, Michael E., 5,462,999, Cl. 526-68.000.
  - Halle, Richard W.; Davis, Donna S.; and Harris, Charles R., Jr., 5,462,807, Cl. 428-500.000.
  - Hendriksen, Dan E.; McGlamery, Gerald G.; Keenan, Michael J.; and Pete, Derrick D., 5,463,157, Cl. 585-511.000.
  - Ou, John D. Y., 5,463,167, Cl. 585-823.000.
  - Slim, David R.; Mohundro, Edgar L.; and Mayo, Stephen M., 5,463,154, Cl. 585-261.000.
- Exxon Research & Engineering Co.: *See—*
  - Brois, Stanley J.; Patil, Abhimanyu O.; Schulz, Wolfgang W.; Hsu, Chang S.; and Garner, Richard T., 5,462,680, Cl. 252-9.000.
- Exxon Research and Engineering Company: *See—*
  - Horvath, Istvan T.; and Rabai, Jozsef, 5,463,082, Cl. 549-46.000.
- Ezawa, Akira, to Nikon Corporation. Camera. 5,463,435, Cl. 354-21.000.
- Fabbrini, Charles J.: *See—*
  - Adkins, Ronald R.; Fabbrini, Charles J.; and Strand, Neal T., 5,462,768, Cl. 427-265.000.
- Fabian, Richard A.: *See—*
  - Lemper, Herbert; Ellis, Robert H.; and Fabian, Richard A., 5,461,895, Cl. 72-21.000.
- Fackler, Ricky L., to Resistance Technology Inc. Sandwich switch construction for a hearing aid. 5,463,692, Cl. 381-68.000.
- Faircloth, D. Michael. Automatic toilet seat lowering. 5,461,734, Cl. 4-246.100.
- Falbo, Michael G., Sr., to American Echo, Inc. Patient midsection and shoulder support apparatus for tilting examination table. 5,461,739, Cl. 5-607.000.
- Falcoff, Allan F.; Delano, James A.; Albers, Robert E.; and Jankowski, Robert C., to Du Pont de Nemours, E. I., and Company. Automated test panel spray/bake device. 5,462,601, Cl. 118-697.000.
- Fallon, Stephen L.: *See—*
  - Verdegan, Barry M.; Holm, Christopher E.; Fallon, Stephen L.; and Schwandt, Brian W., 5,462,679, Cl. 210-798.000.
- Fandrich, Mickey L.; Lee, Kelvin W.; Kreiffels, Jerry A.; Kynett, Virgil N.; and Robinson, Kurt B., to Intel Corporation. Command interface between user commands and a memory device. 5,463,757, Cl. 395-430.000.
- Fanuc, Ltd.: *See—*
  - Hara, Ryuichi; Nagayama, Atsuo; and Kumiya, Hidetoshi, 5,463,297, Cl. 318-568.130.
  - Ito, Susumu; and Kojima, Kunio, 5,462,428, Cl. 425-567.000.
  - Uchida, Hiroyuki, 5,463,262, Cl. 310-156.000.
- Farchi, David; and Agar, Joram, to Agar Corporation Inc. Apparatus and method for measuring two-or three-phase fluid flow utilizing one or more momentum flow meters and a volumetric flow meter. 5,461,930, Cl. 73-861.040.
- Farley, Scott A.; and Meinecke, Errol L. Rock guard for a combine. 5,462,487, Cl. 460-105.000.
- Farrar, Michael A.: *See—*
  - Schreiber, Robert D.; Greenlund, Andrew C.; and Farrar, Michael A., 5,463,023, Cl. 530-327.000.
- Farrauto, Robert J.; Voss, Kenneth E.; and Heck, Ronald M., to Engelhard Corporation. Ceria-alumina oxidation catalyst. 5,462,907, Cl. 502-304.000.
- Fearing Manufacturing Company: *See—*
  - Johnson, George N., 5,461,807, Cl. 40-301.000.
- Fearing Manufacturing Co., Inc.: *See—*
  - Johnson, George N., 5,461,805, Cl. 40-301.000.
- Featherstone, John L.: *See—*
  - Gallup, Darrell L.; Featherstone, John L.; and Flint, Carl E., 5,462,668, Cl. 210-696.000.
- Fecker, Viktor: *See—*
  - Koch, Klaus; Fuchs, Michael; and Fecker, Viktor, 5,461,957, Cl. 83-713.000.
- Fehringer, Robert L.: *See—*
  - Clupper, Charles B.; Emigh, Jonathan D.; Mulkey, Steven L.; Fehringer, Robert L.; Flickner, Brett J.; Saldana, Daniel M.; and Delfer, Frank W., III, 5,462,399, Cl. 414-790.300.
- Fells, Cedric H. Brake caliper tool. 5,462,250, Cl. 248-371.000.
- Felsenthal, Gil. Amusement outdoor water spray. 5,462,284, Cl. 273-413.000.
- Feltrin, Richard A., to Prototype Systems, Inc. Modular tooling system for die model verification. 5,462,263, Cl. 269-69.000.
- Fenley, R. Earl, Jr.: *See—*
  - Chiang, Marilyn C.; Fenley, R. Earl, Jr.; Holland, George F.; Javvaji, Anand K.; and Sreedhara, Ramadevi, 5,463,670, Cl. 379-27.000.
- Fenton, Miles: *See—*
  - Ridgewell, Barry A.; and Fenton, Miles, 5,462,406, Cl. 416-111.000.
- Ferag AG: *See—*
  - Meier, Jacques, 5,462,266, Cl. 270-54.000.
- Ference, Jonathan H.: *See—*
  - D'Aleo, Michael J.; Ference, Jonathan H.; Hakkarainen, Simo P.; Spira, Joel S.; and Tucker, Darryl W., 5,463,286, Cl. 315-295.000.
- Ferm, Paul M.: *See—*
  - Beeson, Karl W.; Zimmerman, Scott M.; Ferm, Paul M.; and McFarland, Michael J., 5,462,700, Cl. 264-1.270.
- Fernandez, Jose M.; and Meadows, Vernon, to Motorola, Inc. Method and apparatus for providing an electronic lockout for a rechargeable battery. 5,462,814, Cl. 429-7.000.
- Ferrara, Joseph J.: *See—*
  - Acquaviva, Thomas; Rees, James D.; Morgan, Paul F.; and Ferrara, Joseph J., 5,463,451, Cl. 355-233.000.
- Ferrara, Katherine W.; and Algazi, V. Ralph, to University of California, The Regents of the. Method for assessing and displaying vascular architecture using ultrasound. 5,462,059, Cl. 128-661.090.
- Ferrofluidics Corporation: *See—*
  - Raj, Kuldip; and Moskowitz, Ronald, 5,462,685, Cl. 252-62.560.
- Ferruti, Paolo; Ranucci, Elisabetta; and Bignotti, Fabio, to Mediolanum Farmaceutici S.p.A. Polycarbonates and the use thereof for the preparation of bioerosible matrices. 5,463,012, Cl. 528-196.000.
- Fetterman, Michael A.: *See—*
  - Vidwans, Rohit A.; Boggs, Darrell D.; Fetterman, Michael A.; and Glew, Andrew F., 5,463,745, Cl. 295-375.000.
- Fevig, John M.; Abelman, Matthew M.; Amparo, Eugene C.; Cacciola, Joseph; Kettner, Charles A.; Pacofsky, Gregory J.; and Wang, Chia-Lin, to Du Pont Merck Pharmaceutical Company, The. Dipeptide boronic acid inhibitors of trypsin-like enzymes. 5,462,964, Cl. 514-423.000.
- Fichtel & Sachs AG: *See—*
  - Gimmler, Joachim, 5,462,145, Cl. 192-3.290.
  - Handke, Günther; Wirth, Alfred; and Zietsch, Andreas, 5,462,142, Cl. 188-299.000.
- Fichter, Manfred: *See—*
  - Widl, Gerhard; and Fichter, Manfred, 5,463,373, Cl. 340-441.000.
- Fiege, Helmut: *See—*
  - Hagedorn, Ferdinand; Fiege, Helmut; and Traenckner, Hans-Joachim, 5,463,068, Cl. 548-152.000.
- Figh, Jack; and Cuddihy, Robert V., Jr., to HMG Worldwide In-Store Marketing, Inc. Point-of-sale product information dissemination arrangement and method. 5,463,209, Cl. 235-383.000.
- Filgas, David M.; McFadden, Gordon M.; Broome, Jeffrey; and York, James F., to Hobart Laser Products, Inc. Laser - optical fiber tuning and control system. 5,463,710, Cl. 385-90.000.
- Filion, Scott M.; Frost, Colin C.; Moore, Denis L.; Roberge, Richard D.; and Yedlin, Vincent J., to Davidson Textron Inc. Horn actuator incorporating a transducer in a steering wheel. 5,463,258, Cl. 307-10.100.
- Fin, Enrico: *See—*
  - Heckel, Robert J.; Fin, Enrico; Gier, Achim R.; and Bonduel, Pascal, 5,461,826, Cl. 49-28.000.
- Finch, Richard: *See—*
  - Schieve, Eric; and Finch, Richard, 5,463,766, Cl. 395-650.000.
- Finger, Edward J. Method and apparatus for reserving seats at entertainment event. 5,462,005, Cl. 116-200.000.
- Finkelstein, Burl: *See—*
  - Lehton, Eino M.; and Finkelstein, Burl, 5,461,829, Cl. 49-409.000.
- Finko, Valery E., to Aktsionernoe Obshestvo "SIGMA-GAZ" . Method and device for gas cooling. 5,461,868, Cl. 62-5.000.
- Finn, Clifford J., to RHH Foam Systems, Inc. Foam dispensing gun. 5,462,204, Cl. 222-137.000.
- Fireblock International, Inc.: *See—*
  - Montgomery, Robert L., 5,462,699, Cl. 252-609.000.
- Firma Carl Freudenberg: *See—*
  - Eckel, Hans-Gerd; Kunkel, Anja; and Müller, Michael, 5,462,261, Cl. 267-140.130.
  - Stief, Reinhard; Müller-Broll, Gerhard; Jost, Thomas; Mattutat, Manfred; and Schmitt, Klaus-Dieter, 5,462,331, Cl. 296-198.000.
- Firma Wegmann & Co. GmbH: *See—*
  - Baus, Rüdiger; and Linge, Reiner, 5,461,961, Cl. 89-1.815.
- Fischer, Reiner; Bretschneider, Thomas; Krüger, Bernd-Wieland; Erdelen, Christoph; Santel, Hans-Joachim; Lürssen, Klaus; Schmidt, Robert R.; Wachendorff-Neumann, Ulrike; and Stendel, Wilhelm, to Bayer Aktiengesellschaft. Substituted 1-H-3-aryl-pyrrolidine-2,4-dione derivatives. 5,462,913, Cl. 504-138.000.
- Fischer, Rolf: *See—*
  - Pinkos, Rolf; and Fischer, Rolf, 5,463,079, Cl. 548-543.000.
- Fisher, Gregory M.; Cebulka, Kathleen D.; Man, Susan K.; Nazif, Zaher A.; and Vinciguerra, Lori J., to Bell Communications Research, Inc. Method of creating user-defined call processing procedures. 5,463,682, Cl. 379-201.000.
- Fishkin, Boris; and Salzman, Phil, to Applied Materials, Inc. Particle monitoring sensor. 5,463,460, Cl. 356-339.000.
- Fishman, Lawrence R. Musical instrument transducer. 5,463,185, Cl. 84-731.000.
- Fiskars Oy Ab: *See—*
  - Lindén, Erkki O.; and Rönnholm, Karl S., 5,461,765, Cl. 29-434.000.

- Fitch, William L.: *See—*
  - Curtis, Ralston; Jain, Rakesh; Creech, David C.; and Fitch, William L., 5,462,915, Cl. 504-323.000.
- Fitzgerald, William V., to Thomson Consumer Electronics, Inc. Power supply stabilization circuit with separate AC/DC negative feedback paths. 5,463,290, Cl. 315-411.000.
- Flanhardt, Michael: *See—*
  - Eidam, Manfred; Flanhardt, Michael; Rauschenbach, Stefan; and Roth, Andreas, 5,462,131, Cl. 180-14.400.
- FlatPlate, Inc.: *See—*
  - Wand, Steven M., 5,462,113, Cl. 165-167.000.
- Flaugh, Michael E.; and Foreman, Mark M., to Eli Lilly and Company. Tetrahydrobenz[c,d]indole serotonin agonists. 5,462,962, Cl. 514-411.000.
- Flentke George R.: *See—*
  - Bachovchin, William W.; Plaut, Andrew G.; and Flentke George R., 5,462,928, Cl. 514-19.000.
- Flickner, Brett J.: *See—*
  - Clupper, Charles B.; Emigh, Jonathan D.; Mulkey, Steven L.; Fehringer, Robert L.; Flickner, Brett J.; Saldana, Daniel M.; and Delfer, Frank W., III, 5,462,399, Cl. 414-790.300.
- Flint, Carl E.: *See—*
  - Gallup, Darrell L.; Featherstone, John L.; and Flint, Carl E., 5,462,668, Cl. 210-696.000.
- Flood, Glenn A. Fishing rod jigging apparatus. 5,461,817, Cl. 43-19.200.
- Floreancig, Paul E.: *See—*
  - Baker, S. Richard; Dillard, Robert D.; Floreancig, Paul E.; Sawyer, J. Scott; and Sofia, Michael J., 5,462,954, Cl. 514-381.000.
- Florens, Raymond: *See—*
  - Jansen, Benedictus; Roefs, André; Sels, Francis; Perdieus, Pieter; and Florens, Raymond, 5,462,831, Cl. 430-139.000.
- Fluid Containment, Inc.: *See—*
  - Bartlow, David H.; and Cannan, Edward B., Jr., 5,462,191, Cl. 220-469.000.
- Fluid Power Industries, Inc.: *See—*
  - Harms, Louis C., 5,461,903, Cl. 73-40.000.
- Flynn, Charles J., to Magnetic Revolutions Limited L.L.I. Permanent magnet control means. 5,463,263, Cl. 310-181.000.
- FMC Corporation: *See—*
  - McGinley, Emanuel J.; and Tuason, Domingo C., Jr., 5,462,761, Cl. 426-573.000.
- Focke & Co. (GmbH & Co.): *See—*
  - Focke, Heinz; and Schlenker, Michael, 5,462,223, Cl. 229-160.100,
- Focke, Heinz; and Schlenker, Michael, to Focke & Co. (GmbH & Co.). Process for coating glue spot rows and strips onto longitudinally extending blanks for hinge-lid packs and blanks produced thereby. 5,462,223, Cl. 229-160.100.
- Fontana, Steven A., to Eli Lilly and Company. Methods of treating menstrual symptoms and compositions therefore. 5,462,950, Cl. 514-324.000.
- Forand, James L.: *See—*
  - Keeney, Harold M.; Van Anglen, Erik S.; and Forand, James L., 5,462,649, Cl. 205-93.000.
- Ford Motor Company: *See—*
  - Chandrasekaran, Kugalur S.; Mills, Daniel M.; and Ogletree, Richard, 5,462,364, Cl. 384-111.000.
  - Kotwicki, Allan J.; Szuszman, Paul J.; Christensen, Edward L.; and Lloyd, Susan J., 5,462,038, Cl. 123-681.000.
  - Mozurkewich, George, 5,461,918, Cl. 73-514.260.
  - Ransom, Keith C.; and Southwell, Michael J., 5,463,194, Cl. 181-240.000.
  - Tang, Sing C.; Lou, Maurice M. K.; and Balun, Thomas J., 5,463,558, Cl. 364-472.000.
- Forehand, David I.: *See—*
  - Chisholm, Michael F.; and Forehand, David I., 5,462,882, Cl. 437-5.000.
- Forehand, Michael E. Power driven seal device. 5,461,976, Cl. 101-31.100.
- Foreman, Mark M.: *See—*
  - Flaugh, Michael E.; and Foreman, Mark M., 5,462,962, Cl. 514-411.000.
- Form Rite Corporation: *See—*
  - Rea, Perry J.; Miller, Michael R.; Iler, Gary T.; and Stevens, William E., 5,462,313, Cl. 285-21.000.
- Forman, Ira R.; and Madduri, Hari H., to International Business Machines Corporation. Failure recovery apparatus and method for distributed processing shared resource control. 5,463,733, Cl. 395-182.080.
- Forrest, John M. S.: *See—*
  - Stewart, Derek; Forrest, John M. S.; and Muller, Werner, 5,462,853, Cl. 435-5.000.
- Forschner, Thomas C.: *See—*
  - Powell, Joseph B.; Slaugh, Lynn H.; Forschner, Thomas C.; Thomason, Terry B.; Semple, Thomas C.; Weider, Paul R.; and Arhancet, Juan P., 5,463,144, Cl. 568-867.000.
  - Powell, Joseph B.; Slaugh, Lynn H.; Forschner, Thomas C.; Semple, Thomas C.; and Weider, Paul R., 5,463,145, Cl. 568-867.000.
  - Slaugh, Lynn H.; Powell, Joseph B.; Forschner, Thomas C.; Semple, Thomas C.; and Weider, Paul R., 5,463,146, Cl. 568-862.000.
- Forsell, Peter. Motor drive unit for a record player. 5,463,613, Cl. 369-266.000.
- Foster, Donald D.; and Nelson, Philip L., to Contico International, Inc. Trigger sprayer operable in upright, downturned and inverted positions. 5,462,209, Cl. 222-376.000.
- Foster, Thomas M., to Composite Manufacturing & Research, Inc. Vegetation barrier. 5,461,823, Cl. 47-33.000.
- Foster Wheeler Energy Corporation: *See—*
  - Abdulally, Igbal F., 5,462,718, Cl. 422-171.000.
  - Newman, Lawrence F., 5,461,990, Cl. 110-261.000.
- Fowler, Roger G.; and Harris, Richard H., to International Business Machines Corporation. Dual cam mounting mechanism for electronic shelf edge labels. 5,461,809, Cl. 40-642.000.
- Fox, Charles E.: *See—*
  - Bender, David L.; Bryan, William C.; Brugman, William; Carlson, Laurence; and Fox, Charles E., 5,462,617, Cl. 156-96.000.
- Fox, Herbert J.: *See—*
  - Swenson, Douglas A.; Fox, Herbert J.; Krueger, Dennis L.; and Lockridge, Rochelle L., 5,462,708, Cl. 264-174.110.
- Fox, Robert F.; and Canning, Peter D., to General Dynamics Corporation. Minimum displacement submarine arrangement. 5,462,003, Cl. 114-316.000.
- Framatome Connectors International: *See—*
  - Boiret, Gérard; and Quillet, Thierry, 5,462,447, Cl. 439-347.000.
- France Bed Co., Ltd.: *See—*
  - Ikeda, Shigeru; and Oguma, Yoshio, 5,461,737, Cl. 5-475.000.
- France Telecom: *See—*
  - Lebourges, Marc, 5,463,686, Cl. 379-220.000.
- Frankel, David B.: *See—*
  - Jeffers, Scott E.; and Frankel, David B., 5,462,309, Cl. 280-759.000.
- Frankot, Robert T., to Hughes Aircraft Company. Hyper-precision SAR interferometry using a dual-antenna multi-pass SAR system. 5,463,397, Cl. 342-25.000.
- Franz, James J.; and Hutchinson, Richard A., to Subsurface Technology Corporation. Porous pipe and process for producing same. 5,462,092, Cl. 138-177.000.
- Franzischka, Wolfgang: *See—*
  - Becker, Rainer; Huellmann, Michael; Palm, Christof; and Franzischka, Wolfgang, 5,463,020, Cl. 528-408.000.
- Franzmann, Gernot: *See—*
  - Penzel, Erich; Franzmann, Gernot; Angel, Maximilian; Pakusch, Joachim; and Schuler, Bernhard, 5,462,978, Cl. 523-342.000.
- Frederich, Fritz: *See—*
  - Körber, Joachim; Niemann, Klaus; Frederich, Fritz; and Günther, Christian, 5,463,550, Cl. 364-426.010.
- Fredsby, Bent E.; and Wormslev, Erik C., to CDM - Quality Fish A/S/. Method, mould, device and apparatus for processing roundfish. 5,462,478, Cl. 452-135.000.
- Freedman, Clive A. H., to Carobel Foam Limited. Method of packaging a foam article, and a foam article as so packaged. 5,462,016, Cl. 119-28.500.
- Freeman, Gary A.; and Hamilton, Ward M., to ŻMD Corporation. Electrode package. 5,462,157, Cl. 206-210.000.
- Freimuth, Lothar: *See—*
  - Van Wagener, Raymond H.; Freimuth, Lothar; and Stein, Michael A., 5,463,522, Cl. 361-103.000.
- French, James C.; Edmunds, Colin R.; McDonnell, Peter; and Showalter, Howard D. H., to Warner-Lambert Company. Process for purifying pentostatin. 5,463,035, Cl. 536-55.300.
- Frengley, Michael C.; and Vu, Thu N., to McDonnell Douglas Helicopter Co. Leading edge weight retention assembly for a helicopter rotor. 5,462,409, Cl. 416-144.000.
- Fresenius, Jürgen; and Gebhardt, Fritz, to Passavant-Werke AG. Suspension and guidance mechanism for the filter plates of a filter press. 5,462,663, Cl. 210-230.000.
- Freskos, John N.: *See—*
  - Vazquez, Michael L.; Mueller, Richard A.; Talley, John J.; Getman, Daniel; DeCrescenzo, Gary A.; and Freskos, John N., 5,463,104, Cl. 514-533.000.
- Frey, Jeffrey A.: *See—*
  - Elko, David A.; Frey, Jeffrey A.; Helffrich, Audrey A.; Isenberg, John F., Jr.; Moore, Brian B.; Nick, Jeffery M.; Swanson, Michael D.; and Williams, Joseph A., 5,463,736, Cl. 395-848.000.
- Frey, Stanley J., to UOP. Paraffin treating process for mercaptan and olefin removal. 5,463,134, Cl. 568-59.000.
- Freyssinet International et Cie: *See—*
  - Stubler, Jérôme; and Chastagnoi, Raymond, 5,461,743, Cl. 14-22.000.
- Frick, Thomas J.: *See—*
  - Moore, Earl H.; Frick, Thomas J.; and Smith, Wayne W., 5,461,878, Cl. 62-255.000.
- Fridheim, Ketil: *See—*
  - Clausen, Eivind; and Fridheim, Ketil, 5,461,747, Cl. 15-104.940.
- Friis, Henrik, to Tomra Systems A/S. Container handling system. 5,462,153, Cl. 198-597.000.
- Fritschi, Hans-Rudolf: *See—*
  - Bidese, Werner; Fritschi, Hans-Rudolf; and Grau, Alfred, 5,463,680, Cl. 379-165.000.
- Fritts, Robert W. Table top backlit display. 5,461,808, Cl. 40-571.000.
- Fritz, John M.: *See—*
  - Demarest, Scott W.; Corba, Robert E.; Miller, Allen D.; Fritz, John M.; and Shanklin, Donald J., 5,462,099, Cl. 141-3.000.
- Fritz, Paul O.: *See—*
  - Sudhakar, Chakka; Dolfinger, Frank, Jr.; Cesar, Max R.; Patel, Mahendra S.; and Fritz, Paul O., 5,462,651, Cl. 208-143.000.
- Froling, Thomas H.; Nistor, Thomas A.; and Sigety, Stephen, Jr., to General Motors Corporation. Control cable end connector. 5,461,938, Cl. 74-502.400.
- Froment, Jean-Paul, to S.A. des Etablissements Staubli (FRANCE). Damper device for weaving machine oscillating members. 5,462,093, Cl. 139-57.000.

- Front Engineering Co. Ltd.: *See—*
  - Iji, Masahiro; Yoda, Masami; Suzuki, Shin; Ishizuka, Kaoru; Kubo, Sotoo; Yamaki, Isao; and Hashimoto, Toshikuni, 5,462,672, Cl. 210-727.000.
- Frost, Colin C.: *See—*
  - Filion, Scott M.; Frost, Colin C.; Moore, Denis L.; Roberge, Richard D.; and Yedlin, Vincent J., 5,463,258, Cl. 307-10.100.
- Fry, Walter G.; and Wolford, Jeff W., to Compaq Computer Corp. Method and apparatus for reducing non-snoop window of a cache controller by delaying host bus grant signal to the cache controller. 5,463,753, Cl. 395-473.000.
- Fuchs, Eberhard: *See—*
  - Witzel, Tom; Fuchs, Eberhard; and Zimmermann, Horst, 5,463,130, Cl. 564-490.000.
- Fuchs, Michael: *See—*
  - Koch, Klaus; Fuchs, Michael; and Fecker, Viktor, 5,461,957, Cl. 83-713.000.
- Fuchs, Neil E.: *See—*
  - Israel, Mark; and Fuchs, Neil E., 5,462,025, Cl. 123-321.000.
- Fugere, Michael A.; and Halpert, David E., to Allen-Bradley Company, Inc. Motion controller with remote linking. 5,463,296, Cl. 318-568.200.
- Fuhrhop, Ronald E.: *See—*
  - Pritchard, Francis E.; Koederitz, Eugene H.; Fuhrhop, Ronald E.; and Barker, Thomas H., Jr., 5,462,429, Cl. 431-3.000.
- Fuji Electric Co., Ltd.: *See—*
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  - Matsuzaki, Kazuo; and Amano, Akira, 5,463,226, Cl. 250-374.000.
- Fuji Photo Film Company, Ltd.: *See—*
  - Yamakawa, Kenji, 5,463,417, Cl. 347-212.000.
- Fuji Photo Film Co., Ltd.: *See—*
  - Asami, Masahiro; Ohshima, Naoto; and Otani, Shigeaki, 5,462,850, Cl. 430-569.000.
  - Esaki, Toshiro; Suzuki, Mituru; Sato, Susumu; Takahashi, Kohichi; and Shimizu, Makoto, 5,462,240, Cl. 242-348.100.
  - Iwasaki, Nobuyuki, 5,462,832, Cl. 430-139.000.
  - Kato, Takashi; and Ikeda, Tadashi, 5,462,851, Cl. 430-584.000.
  - Kawamoto, Fumio; Sakaino, Yoshiki; and Yoshida, Shohei, 5,462,824, Cl. 430-501.000.
  - Nishikawa, Tetsuo; and Hagiwara, Tatsuya, 5,463,475, Cl. 358-325.000.
  - Otani, Shigeaki, 5,462,847, Cl. 430-508.000.
  - Saito, Osamu, 5,463,419, Cl. 348-233.000.
  - Sawada, Hirokazu; Uesugi, Akio; and Matsuki, Masaya, 5,462,614, Cl. 148-551.000.
  - Suzuki, Kenji, 5,463,445, Cl. 355-71.000.
  - Tanaka, Mitsutoshi, 5,462,820, Cl. 429-174.000.
  - Terashita, Takaaki; and Nakamura, Hiroaki, 5,463,470, Cl. 358-298.000.
  - Watanabe, Naoki; Okutsu, Hirokazu; Isozaki, Masakazu; and Inoue, Kenji, 5,463,444, Cl. 355-27.000.
  - Yoneyama, Hiroyuki, 5,462,846, Cl. 430-507.000.
  - Yoshioka, Yasuhiro, 5,462,845, Cl. 430-505.000.
- Fuji Xerox Co., Ltd.: *See—*
  - Inaba, Shigeru; Fukuhara, Masaaki; Hirota, Makoto; Yamamoto, Mitsuo; Abe, Jun; Miyata, Hideaki; Sunaga, Takayuki; Ishikawa, Toru; Shiina, Yoshio; Isosu, Toru; and Kanno, Makoto, 5,463,452, Cl. 355-246.000.
  - Nukada, Katsumi; and Daimon, Katsumi, 5,463,041, Cl. 540-139.000.
  - Nukada, Katsumi; Imai, Akira; Daimon, Katsumi; Iijima, Masakazu; Mashimo, Kiyokazu; Sakaguchi, Yasuo; and Takegawa, Ichiro, 5,463,043, Cl. 540-141.000.
  - Nukada, Katsumi; Imai, Akira; and Iijima, Masakazu, 5,463,044, Cl. 540-143.000.
  - Okada, Junji, 5,462,891, Cl. 437-187.000.
  - Oya, Kazuhiro, 5,463,476, Cl. 358-426.000.
  - Sakai, Yoshihiko; and Yamada, Takayuki, 5,462,886, Cl. 437-41.000.
  - Seto, Masanori, 5,463,490, Cl. 359-200.000.
  - Wakabayashi, Kimihiro; and Nebashi, Noriyuki, 5,462,648, Cl. 205-75.000.
  - Yagi, Shigeru; Ono, Masato; Higashi, Taketoshi; Ohta, Tsuyoshi; and Fukuda, Yuzuru, 5,462,827, Cl. 430-65.000.
  - Yashiki, Yuichi; Hondumi, Masahiko; Ohki, Yuzuru; Ito, Takashi; Nakjajima, Fumitaka; Mori, Masakazu; Aoki, Takayoshi; Mizuishi, Harumitsu; and Shibuya, Yuusaku, 5,463,456, Cl. 355-299.000.
  - Yui, Toshitake; Yamashita, Yoshiro; Koide, Fuminori; Chujo, Akihiko; and Hashimoto, Ken, 5,462,590, Cl. 106-20.00R.
- Fujieda, Masanao: *See—*
  - Isogai, Naoki; Mimura, Yoshiaki; and Fujieda, Masanao, 5,463,430, Cl. 351-208.000.
- Fujii, Choichiro: *See—*
  - Iwatani, Hidetoshi; Fujino, Masato; Matsumoto, Shinji; Fujii, Choichiro; and Kazama, Masakazu, 5,463,365, Cl. 336-98.000.
- Fujii, Hiroshi: *See—*
  - Masuda, Mitsuo; and Fujii, Hiroshi, 5,462,325, Cl. 293-102.000.
- Fujii, Masafumi: *See—*
  - Yano, Keiichi; Takahashi, Takashi; Kimura, Kazuo; Sato, Yoshitoshi; Yamakawa, Kouji; Yamamoto, Toshishige; Fujii, Masafumi; Hashimoto, Shizuki; and Takamichi, Hiroshi, 5,463,248, Cl. 257-677.000.
- Fujii, Tetsuo; and Imai, Masahito, to Nippondenso Co., Ltd. Mechanical force sensing semiconductor device. 5,461,916, Cl. 73-514.320.
- Fujii, Toshifumi, to Rohm Co., Ltd. Apparatus for measuring characteristics of electronic parts. 5,463,325, Cl. 324-761.000.
- Fujimoto, Hiroaki: *See—*
  - Meki, Naoto; Imahase, Tomotoshi; Nishida, Kazue; Fujimoto, Hiroaki; Mikitani, Kenichi; Takano, Hirotaka; Ogasawara, Yoriko; and Tamaki, Masahiro, 5,462,961, Cl. 514-407.000.
- Fujino, Masato: *See—*
  - Iwatani, Hidetoshi; Fujino, Masato; Matsumoto, Shinji; Fujii, Choichiro; and Kazama, Masakazu, 5,463,365, Cl. 336-98.000.
- Fujisawa, Ichiro: *See—*
  - Tsunoda, Kazuyuki; and Fujisawa, Ichiro, 5,463,368, Cl. 340-309.150.
- Fujita, Akira; and Yoshimatsu, Naoki, to Mitsubishi Denki Kabushiki Kaisha. Power semiconductor package having improved durability. 5,463,251, Cl. 257-717.000.
- Fujita, Koki: *See—*
  - Hara, Koji; Fujita, Koki; Kuwahara, Nobuhiro; Kitahata, Sumio; and Koizumi, Kyoko, 5,463,039, Cl. 536-124.000.
- Fujita, Kouji: *See—*
  - Kaniwa, Kouji; Nishijima, Hideo; Fujita, Kouji; and Nishimura, Keizo, 5,463,505, Cl. 360-73.040.
- Fujita, Mahito: *See—*
  - Akahori, Kingo; Ohta, Yoshiteru; Omura, Takashi; Fujita, Mahito; and Harada, Naoki, 5,463,032, Cl. 534-642.000.
- Fujita, Yoshihisa: *See—*
  - Kumagai, Masakatsu; and Fujita, Yoshihisa, 5,462,172, Cl. 209-12.100.
- Fujitsu Limited: *See—*
  - Hayashi, Ryotaro, 5,463,637, Cl. 371-21.100.
  - Kobayashi, kazuya; Miyasaka, Kiyoshi; and Ogawa, Junji, 5,463,582, Cl. 365-189.050.
  - Maruyama, Takumi; Onodera, Takashi; Hatakenaka, Nobuko; Uno, Hiroaki; and Yokoshi, Noriyuki, 5,463,663, Cl. 375-356.000.
  - Nasu, Yasuhiro; Ichimura, Teruhiko; and Matsumoto, Tomotaka, 5,462,885, Cl. 437-40.000.
  - Ryu, Tadamitsu; Kakehi, Gen; and Aoe, Shigeru, 5,463,381, Cl. 340-825.150.
  - Sakakibara, Yasubumi; and Misue, Kazuo, 5,463,773, Cl. 395-600.000.
  - Takashina, Nobuaki, 5,463,583, Cl. 365-189.060.
  - Toda, Junzo; and Aoyama, Susumu, 5,463,517, Cl. 360-113.000.
  - Waki, Masaki; Kasai, Junichi; Aoki, Tsuyoshi; Honda, Toshiyuki; and Sato, Hirotaka, 5,463,253, Cl. 257-724.000.
  - Yamada, Isamu; Shiba, Akira; and Iizuka, Miyuki, 5,462,058, Cl. 128-661.080.
  - Yamamoto, Shuji, 5,463,631, Cl. 371-5.100.
- Fujitsu Limited & Fujitsu Microcomputer Systems Ltd.: *See—*
  - Taniai, Takayoshi; Satoh, Hajime; Shimura, Hidetoshi; and Saitoh, Tadashi, 5,463,740, Cl. 395-299.000.
- Fujiwara, Yoshio: *See—*
  - Ito, Kengo; Mizumachi, Motohiro; Fujiwara, Yoshio; and Shinohara, Satoru, 5,462,910, Cl. 503-227.000.
- Fukami, Toshiyuki: *See—*
  - Tanaka, Masashi; Fukami, Toshiyuki; Katsukawa, Masato; and Nakamori, Hideo, 5,462,825, Cl. 430-58.000.
- Fukano, Yoshihiro; Makado, Shoichi; and Arakawa, Takeshi, to SMC Kabushiki Kaisha. Directional control valve and a valve assembly using directional control valves. 5,462,087, Cl. 137-884.000.
- Fukanuma, Tetsuhiko: *See—*
  - Shimizu, Izuru; Yoshida, Tetsuo; Iguchi, Masao; and Fukanuma, Tetsuhiko, 5,462,418, Cl. 418-55.300.
- Fukasawa, Atsushi; Kawabe, Manabu; Kawahashi, Akiyoshi; and Sato, Takuro, to Oki Electric Industry Co., Ltd. Block-spreading code-division multiple-access demodulator with improved interference cancellation. 5,463,660, Cl. 375-205.000.
- Fukaya, Shinji: *See—*
  - Sasou, Hiroshi; Kaya, Tomoki; Watanabe, Tosiaki; and Fukaya, Shinji, 5,463,208, Cl. 235-380.000.
- Fukazawa, Nobuyuki; Suzuki, Tsuneji; Kawauchi, Nobuya; Komatsu, Hironori; Otsuka, Kengo; and Nakajima, Yuki, to Mitsui Toatsu Chemicals, Incorporated. Process for production of glycide derivative. 5,463,061, Cl. 546-158.000.
- Fukuda, Nobuhiro: *See—*
  - Takase, Mitsuo; Fukuda, Nobuhiro; and Dodo, Toshihiro, 5,463,229, Cl. 257-59.000.
- Fukuda, Yuzuru: *See—*
  - Yagi, Shigeru; Ono, Masato; Higashi, Taketoshi; Ohta, Tsuyoshi; and Fukuda, Yuzuru, 5,462,827, Cl. 430-65.000.
- Fukuhara, Masaaki: *See—*
  - Inaba, Shigeru; Fukuhara, Masaaki; Hirota, Makoto; Yamamoto, Mitsuo; Abe, Jun; Miyata, Hideaki; Sunaga, Takayuki; Ishikawa, Toru; Shiina, Yoshio; Isosu, Toru; and Kanno, Makoto, 5,463,452, Cl. 355-246.000.
- Fukumoto, Kazuhiro: *See—*
  - Nagami, Tetsuo; Ogura, Yoshitsugu; Ogai, Masahiko; Fukushima, Yoshiaki; Inagaki, Shinji; Fukumoto, Kazuhiro; Banno, Kouji; Sakakibara, Yuji; Takada, Yasuo; Ohta, Takashi; Okada, Akane; Yamada, Yukimura; Hayashi, Kiyotaka; Matsuura, Shinji; and Kuroda, Kaz, 5,462,905, Cl. 502-232.000.
- Fukumoto, Takehiko; Iwai, Daisuke; Okano, Shigeo; Suzuki, Hiroshi; and Oshima, Mitsuyoshi, to Shin-Etsu Chemical Co., Ltd. 1-halo-cis-3-tetradecenes and processes for the preparation of cis-olefin compounds by using same. 5,463,149, Cl. 570-135.000.
- Fukuoka, Akira; Kawai, Jun; and Tagami, Satoru, to NEC Corporation. Piezoelectric transformer having improved electrode arrangement. 5,463,266, Cl. 310-359.000.
- Fukushima, Yoshiaki: *See—*

Nagami, Tetsuo; Ogura, Yoshitsugu; Ogai, Masahiko; Fukushima, Yoshiaki; Inagaki, Shinji; Fukumoto, Kazuhiro; Banno, Kouji; Sakakibara, Yuji; Takada, Yasuo; Ohta, Takashi; Okada, Akane; Yamada, Yukimura; Hayashi, Kiyotaka; Matsuura, Shinji; and Kuroda, Kaz, 5,462,905, Cl. 502-232.000.
Fukuyama, Masahiro: *See—*
Yamamoto, Keisaku; Ikeda, Kiyoshi; and Fukuyama, Masahiro, 5,462,975, Cl. 521-90.000.
Fuller, Russell, to Coyote Enterprises, Inc. Window mounted automobile security alarm. 5,463,371, Cl. 340-426.000.
Funabashi, Motohisa: *See—*
Maeda, Akira; Sugimura, Yoshikane; Funabashi, Motohisa; Nakano, Toshihiko; Someya, Ryuko; and Kosaka, Michitaka, 5,463,718, Cl. 395-23.000.
Funada, Masahiro; Ohta, Ken-ichi; Takaragi, Yoichi; and Ohta, Eiji, to Canon Kabushiki Kaisha. Image processing apparatus capable of discriminating a predetermined image. 5,463,469, Cl. 358-296.000.
Funai, Kiyoshi: *See—*
Kurosawa, Miki; Ogawa, Shuji; Sugahara, Masayuki; Funai, Kiyoshi; Yumura, Takashi; and Yamamoto, Tetsu, 5,463,202, Cl. 219-121.830.
Funaki, Masaki, to Victor Company of Japan, Ltd. MOSFET device having depletion layer. 5,463,237, Cl. 257-336.000.
Funderburk, C. Michael; Jordan, P. Kurt; Newman, John A.; McEwen, J. C.; and Howell, David C., to Sara Lee Corporation. Feed system for a sewing machine. 5,461,998, Cl. 112-306.000.
Furay, David M.: *See—*
Morehouse, James H.; Furay, David M.; Blagaila, John; Dion, F. Eugene; Shelstad, Scott A.; and Woods, Jimmy L., 5,463,507, Cl. 360-97.020.
Furman, Anatol: *See—*
Divakaruni, Sridhar; Dreibelbis, Jeffrey H.; Ellis, Wayne F.; Furman, Anatol; and Kalter, Howard L., 5,463,335, Cl. 327-143.000.
Furneaux, David M., to Mars, Incorporated. Method and apparatus for coin validation. 5,462,151, Cl. 194-318.000.
Furukawa, Hiroki; Tagawa, Junichi; Kanamori, Takeo; and Ibaraki, Satoru, to Matsushita Electric Industrial Co., Ltd. Echo canceller. 5,463,618, Cl. 370-32.100.
Furukawa, Ikkoh: *See—*
Tokuda, Toshimasa; Furukawa, Ikkoh; and Miyauchi, Masayoshi, 5,463,013, Cl. 528-196.000.
Furukawa, Mikio: *See—*
Tomioka, Isao; Nakano, Takeshi; Furukawa, Mikio; and Echigo, Yoshiaki, 5,463,016, Cl. 528-353.000.
Furukawa, Toshiharu: *See—*
Kubota, Hideyuki; Horiike, Mitsuaki; and Furukawa, Toshiharu, 5,462,830, Cl. 430-110.000.
Furukawa, Yoshihisa: *See—*
Joichi, Masahiko; and Furukawa, Yoshihisa, 5,463,767, Cl. 395-183.130.
Furukawa, Yutaka: *See—*
Miyata, Hirofumi; Akahoshi, Yoshihiro; Ikeda, Eiichiro; and Furukawa, Yutaka, 5,462,492, Cl. 474-38.000.
Furukido, Takeshi: *See—*
Maeda, Takashi; Furukido, Takeshi; Hoshino, Kousaku; Udo, Satoru; and Izumi, Masayoshi, 5,462,291, Cl. 277-100.000.
Furuya, Yoshinobu, to Yazaki Corporation. Rain cover of an ignition plug attaching hole. 5,462,023, Cl. 123-143.00C.
Fusegawa, Izumi: *See—*
Takano, Kiyotaka; Fusegawa, Izumi; Yamagishi, Hirotoshi; Mizuishi, Koji; and Ogino, Katsuhiko, 5,462,010, Cl. 117-14.000.
Fushimi, Akira: *See—*
Miyazoe, Seigo; Hisai, Tsuneyoshi; Fushimi, Akira; Takeoka, Kazuhiko; Okude, Yoshitaka; and Kurauchi, Takeo, 5,462,770, Cl. 427-407.100.
Futaba Corporation: *See—*
Kawasaki, Hiroaki; Sakurada, Hiroshi; Narushima, Shinichi; Iwasa, Tadashi; and Yamaguchi, Hiroshi, 5,463,276, Cl. 313-496.000.
Futami, Motoo; Endo, Tunehiro; Notohara, Yasuo; and Kitayama, Tooru, to Hitachi, Ltd. Current controller for controlling a current flowing in a load using a PWM inverter and method used thereby. 5,463,299, Cl. 318-618.000.
Futatsuka, Rensei; Chiba, Shunichi; and Kumagai, Junichi, to Mitsubishi Shindoh Co., Ltd. Lead frame material formed of copper alloy for resin sealed type semiconductor devices. 5,463,247, Cl. 257-666.000.
Futura Nova B.V.: *See—*
Kist, Joost; Rovers, Willem P. G.; and Vanden Berghe, Dirk A., 5,462,063, Cl. 128-756.000.
G. D. Searle & Co.: *See—*
Vazquez, Michael L.; Mueller, Richard A.; Talley, John J.; Getman, Daniel; DeCrescenzo, Gary A.; and Freskos, John N., 5,463,104, Cl. 514-533.000.
G.D Societa' Per Azioni: *See—*
Boriani, Silvano; and Minarelli, Alessandro, 5,461,954, Cl. 83-49.000.
Brizzi, Marco; and Gamberini, Antonio, 5,461,842, Cl. 53-234.000.
Brizzi, Marco; and Gamberini, Antonio, 5,462,401, Cl. 414-797.000.
G.P.E. S.R.L.: *See—*
Panontin, Renzo; and Del Ben, Ivo, 5,463,440, Cl. 354-298.000.
Gabrelian, Edward E.: *See—*
West, Laurice J.; and Gabrelian, Edward E., 5,463,407, Cl. 343-786.000.
Gabriel, Calvin T., to VLSI Technology, Inc. Semiconductor processing method for preventing corrosion of metal film connections. 5,462,892, Cl. 437-189.000.
Gabrielson, Stefan: *See—*
Divincenzo, Gregory T.; and Gabrielson, Stefan, 5,463,199, Cl. 218-158.000.
Gaechter, Barbara I.; Sahni, Paramdeep S.; and Tseng, I. Grace, to AT&T IPM Corp. Network based outbound call management. 5,463,685, Cl. 379-207.000.
Gaffney, Anne M.; and Jones, C. Andrew, to ARCO Chemical Technology, L.P. Process for treating polyether polyols. 5,462,971, Cl. 521-40.000.
Gagnon, Richard T., to Innovation Technologies. Method and apparatus for speech generation from phonetic codes. 5,463,715, Cl. 395-2.760.
Gaillard, Christian; and Papineschi, Thierry, to Compagnie Francaise des Etablissements Gaillard. Road crash barrier comprising at least one horizontal wooden rail. 5,462,258, Cl. 256-13.100.
Gaito, Andre A.; and Portofee, Donald C. Electrified board game. 5,462,281, Cl. 273-238.000.
Gajda, Gregory J.; and Barger, Paul T., to UOP. Olefin isomerization process. 5,463,161, Cl. 585-671.000.
Gal, George; and Morrow, Howard E., to Lockheed Missiles & Space Company, Inc. Internally cooled large aperture microlens array with monolithically integrated microscanner. 5,463,498, Cl. 359-622.000.
Galley, Peter T.: *See—*
Albery, John W.; and Galley, Peter T., 5,462,645, Cl. 204-153.120.
Gallicchio, James: *See—*
Schroeder, Edward A.; and Gallicchio, James, 5,462,269, Cl. 273-15.00R.
Gallo, Mario, deceased (by Carl Burckhardt, executor): *See—*
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Galloway, William C., to Compaq Computer Corp. Method of improving SCSI operations by actively patching SCSI processor instructions. 5,463,743, Cl. 395-285.000.
Gallup, Darrell L.; Featherstone, John L.; and Flint, Carl E., to Union Oil Company of California. Use of steam to condensate to dilute brine stream additives. 5,462,668, Cl. 210-696.000.
Galperin, Leonid B.; Bricker, Jeffery C.; and Holmgren, Jennifer S., to UOP. Upgrading of cyclic naphthas. 5,463,155, Cl. 585-310.000.
Gamberini, Antonio: *See—*
Brizzi, Marco; and Gamberini, Antonio, 5,461,842, Cl. 53-234.000.
Brizzi, Marco; and Gamberini, Antonio, 5,462,401, Cl. 414-797.000.
Gambino, Richard J.; and Ruf, Ralph R., to International Business Machines Corporation. Magneto-optic memory allowing direct overwrite of data. 5,463,578, Cl. 365-122.000.
Gamemax Corporation: *See—*
Chang, Yuan F., 5,462,150, Cl. 194-206.000.
Gamer, Abram: *See—*
Lowe, Danny D.; Wilson, Gordon G.; Baker, Michael E.; and Gamer, Abram, 5,462,275, Cl. 273-94.000.
Gandia, Liberto: *See—*
Poux, Jacques; Gandia, Liberto; and Rouget, Frédéric, 5,462,088, Cl. 138-39.000.
Ganguly, Ashit K.: *See—*
Shih, Neng-Yang; Aslanian, Robert; Lupo, Andrew, Jr.; Piwinski, John J.; Green, Michael J.; and Ganguly, Ashit K., 5,463,074, Cl. 548-314.700.
Gao, Zhan: *See—*
Bischoff, Erwin; Gao, Zhan; Wohlfeil, Stefan; Hecker, Gabriele; Cleophax, Jeannine; Dubreuil, Didier; Gero, Stéphane; Olesker, Alice; Verre-Sebrie, Catherine; Vieira de Almeida, Mauro; and Vass, Georges, 5,463,087, Cl. 549-336.000.
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Pascucci, Gregory A.; Rasmussen, David E.; Decious, Gaylon M.; Garbe, James R.; Hyzer, Susan M.; Woest, Karen L.; Vairavan, Vairavan; Koch, David L.; Gottschalk, Donald A., Jr.; Burkhardt, Dennis E.; Standish, Darrell E.; Madaus, Paul W.; Spacek, Dan J.;, 5,463,735, Cl. 395-200.100.
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Dumarot, Daniel P.; and Garcia, Armando, 5,463,755, Cl. 395-475.000.
Garcia, Frank: *See—*
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Garcia, Martha T. Z.: *See—*
Sandoval, Guillermo C.; Toledo, Sergio E. M.; and Garcia, Martha T. Z., 5,463,125, Cl. 564-170.000.
Gardner, John P. Tape winding apparatus. 5,462,631, Cl. 156-505.000.
Gardner, Michael S. Ear tag applicator. 5,462,554, Cl. 606-117.000.
Garfinkel, David J.; and Curcio, M. Joan, to United States of America, Health and Human Services. DNA for use in a simple method for detecting inhibitors of retrotransposition. 5,462,873, Cl. 435-254.200.
Garner, Richard T.: *See—*
Brois, Stanley J.; Patil, Abhimanyu O.; Schulz, Wolfgang W.; Hsu, Chang S.; and Garner, Richard T., 5,462,680, Cl. 252-9.000.
Garnett, Merrill. Palladium compleaes and methods for using same in the treatment of tumors or Psoriasis. 5,463,093, Cl. 554-102.000.
Garraffo, Hugo M.: *See—*
Daly, John W.; Spande, Thomas F.; and Garraffo, Hugo M., 5,462,956, Cl. 514-397.000.
Garrigus, Darryl F., to Boeing Company, The. Method and apparatus for producing perovskite compositions. 5,462,009, Cl. 117-7.000.
Garvin, Ronald V.; Inman, Larry R.; and Schuette, Arthur P., to Ag-Bag International. Method for treatment of bagged organic materials. 5,461,843, Cl. 53-434.000.
Gas Research Institute: *See—*
Desmarteau, Darryl D., 5,463,005, Cl. 526-240.000.
Gavlin, Gilbert; and Coltsin, Boris, 5,462,584, Cl. 95-231.000.

Goto, Yuichiro; Kasa, Hideki; and Harada, Takatomo, 5,462,314, Cl. 285-21.000.
Gasche, Hans-Erich: *See—*
Schön, Norbert; Rechner, Johann; Wagner, Paul; Buysch, Hans-Josef; Gasche, Hans-Erich; and Leiberich, Ricarda, 5,463,102, Cl. 558-274.000.
Gaskins, Darius D.; and Parks, Terry J., to Dell USA, L.P. Redundant memory channel array configuration with data striping and error correction capabilities. 5,463,643, Cl. 371-40.100.
Gasparro, Francis P.: *See—*
Edelson, Richard L.; and Gasparro, Francis P., 5,462,733, Cl. 424-93.710.
Gass, Volker: *See—*
de Rooij, Nicolaas Frans; Jeanneret, Sylvain; Gass, Volker; and van der Schoot, Bart, 5,462,839, Cl. 430-320.000.
Gassen, Karl-Rudolf: *See—*
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Gatlin, Noel A., to United Coatings, Inc. Shaker with cam operated clamp. 5,462,353, Cl. 366-209.000.
Gatter, Erich M.: *See—*
Brown, David M.; Gatter, Erich M.; and Littau, Cheryl A., 5,463,094, Cl. 554-110.000.
Gatzke, Arnold L.: *See—*
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Gaugler, Beatrice: *See—*
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Gavlin, Gilbert; and Coltsin, Boris, to Gas Research Institute. Process for dehydrating natural gas. 5,462,584, Cl. 95-231.000.
Gazalski, Richard S. Decoy anchor. 5,461,816, Cl. 43-3.000.
Gazzaniga, Annibale: *See—*
Stroppolo, Federico; Bonadeo, Daniele; and Gazzaniga, Annibale, 5,463,117, Cl. 562-496.000.
GD Searle & Co.: *See—*
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Gearing, Graham O.: *See—*
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Gebhardt, Fritz: *See—*
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Gednalske, Joe V.; and Herzfeld, Robert W., to Cenex/Land O'Lakes Agronomy Company. 2,4-dicholorophenoxy acetic acid reduced odor herbicidal mixture. 5,463,180, Cl. 504-323.000.
Gehrich, John L.; Maxwell, Thomas P.; Hacker, Thomas G.; and Holody, Mark Z., to Minnesota Mining And Manufacturing Co. Apparatus and method for use in measuring a compositional parameter of blood. 5,462,052, Cl. 128-632.000.
Geis, Michael W.; Macaulay, John M.; and Twichell, Jonathan C., to Silicon Video Corp.; and Massachusetts Institute of Technology. Structure for enhancing electron emission from carbon-containing cathode. 5,463,271, Cl. 313-346.00R.
Gelman, Andrew: *See—*
Kossovsky, Nir; Hnatyszyn, H. James; and Gelman, Andrew, 5,462,751, Cl. 424-494.000.
GenCorp Inc.: *See—*
Dupuy, Ronald E., 5,461,830, Cl. 49-449.000.
General Dynamics Corporation: *See—*
Fox, Robert F.; and Canning, Peter D., 5,462,003, Cl. 114-316.000.
General Electric Company: *See—*
Berkcan, Ertugrul, 5,463,313, Cl. 324-117.00R.
Berkcan, Ertugrul, 5,463,458, Cl. 356-28.000.
Castleberry, Donald E., 5,463,242, Cl. 257-448.000.
Cuddihy, Paul E.; and Shah, Rasiklal P., 5,463,768, Cl. 395-183.130.
Eberhard, Jeffrey W.; and Tam, Kwok C., 5,463,666, Cl. 378-4.000.
El-Hamamsy, Sayed-Amr, 5,463,285, Cl. 315-248.000.
Kwasnick, Robert F.; Wei, Ching-Yeu; and Kingsley, Jack D., 5,463,225, Cl. 250-370.110.
Kwasnick, Robert F.; and Pimbley, Joseph M., 5,463,322, Cl. 324-522.000.
Staver, Daniel A.; and McGrath, Donald T., 5,463,569, Cl. 364-724.100.
Tam, Kwok C., 5,463,721, Cl. 395-127.000.
Youngs, John K., 5,463,177, Cl. 423-10.000.
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Walker, Gordon K.; and Moroney, Paul, 5,463,403, Cl. 342-359.000.
General Motors Corporation: *See—*
Asthana, Anjan; Henry, James P.; and Hamilton, Melissa A., 5,462,253, Cl. 251-121.000.
Burkett, Michael J.; and Adonakis, Nikolaos A., 5,461,967, Cl. 92-71.000.
Covert, Charles H.; Wagner, Richard W.; Turner, Kenneth W.; and Meyer, Karen M., 5,462,100, Cl. 141-59.000.
Cymbal, William D., 5,461,937, Cl. 74-493.000.
Froling, Thomas H.; Nistor, Thomas A.; and Sigety, Stephen, Jr., 5,461,938, Cl. 74-502.400.
Hotton, Donald J.; and Broad, Sherry A., 5,461,764, Cl. 29-91.000.
Lienhart, Shelly L.; and Rademacher, Roger J., 5,462,190, Cl. 220-375.000.
Payne, Scott T.; Wize, Gary A.; and Carl, James E., 5,462,332, Cl. 297-216.100.
Sherman, James F., 5,462,147, Cl. 192-18.00A.
Stein, Arthur C.; and Reynolds, John J., 5,462,421, Cl. 425-4.00R.
Tanke, Eugene T., II; and Dodak, Tony M., 5,462,132, Cl. 180-149.000.
Webber, James L.; and Holmes, Francis J., 5,462,307, Cl. 280-737.000.
Generla Electric Company: *See—*
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Genetronics, Inc.: *See—*
Hofmann, Gunter A., 5,462,520, Cl. 604-20.000.
Gennesseaux, André, to Hutchinson. Hydraulic antivibration devices. 5,462,262, Cl. 267-140.130.
George, Glen A.: *See—*
Whiting, Douglas L.; George, Glen A.; and Ivey, Glen E., 5,463,390, Cl. 341-51.000.
George Ingraham Corp., The: *See—*
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George, John B.; and Smith, Lawrence E., to Thomson Consumer Electronics, Inc. Bus controlled electrode voltage for a cathode ray tube. 5,463,288, Cl. 315-382.000.
Georgia Tech Research Corporation: *See—*
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Gerhardt, Klaus: *See—*
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Gerk, Wilhelm: *See—*
Jung, Udo; Eidam, Herbert; and Gerk, Wilhelm, 5,462,484, Cl. 454-187.000.
Germann, Albrecht J., to De La Rue Giori S.A. Device for transferring single sheets to the impression cylinder of a sheet fed rotary printing machine. 5,461,977, Cl. 101-137.000.
Gero, Stéphane: *See—*
Bischoff, Erwin; Gao, Zhan; Wohlfeil, Stefan; Hecker, Gabriele; Cleophax, Jeannine; Dubreuil, Didier; Gero, Stéphane; Olesker, Alice; Verre-Sebrie, Catherine; Vieira de Almeida, Mauro; and Vass, Georges, 5,463,087, Cl. 549-336.000.
Gersemsky, Udo, to Mannesmann Aktiengesellschaft. Traveling trolley, in particular single-rail trolley with compact height. 5,461,985, Cl. 105-30.000.
Gerszberg, Irwin, to AT&T IPM Corp. Extended home indentification being used by the same service provider as a home identification in a service area other than the home service area for cellular radio telephone systems. 5,463,675, Cl. 379-60.000.
Gest, Stephen B.: *See—*
Tate, Bruce A.; Chow, Alex C.; and Gest, Stephen B., 5,463,769, Cl. 395-700.000.
Getman, Daniel: *See—*
Vazquez, Michael L.; Mueller, Richard A.; Talley, John J.; Getman, Daniel; DeCrescenzo, Gary A.; and Freskos, John N., 5,463,104, Cl. 514-533.000.
Ghosh, Subir K.; and Bhattacharya, Dipankar, to Opti, Inc. Adaptive write-back method and apparatus wherein the cache system operates in a combination of write-back and write-through modes for a cache-based microprocessor system. 5,463,759, Cl. 395-461.000.
Gibb, Robert F., to Raptor, Inc. Proximity detection system and oscillator, and method of using same. 5,463,378, Cl. 340-618.000.
Gibbs, David M., to Litton Systems, Inc. Pulse forming network for diode laser. 5,463,648, Cl. 372-38.000.
Gibbs, Vickie L.; and Kao, Rom-Shen, to Mitsubishi Semiconductor America, Inc. Method and apparatus for determining error location. 5,463,642, Cl. 371-40.100.
Gibeck Respiration AB: *See—*
Lambert, Hans; and Grebius, Jan, 5,462,048, Cl. 128-201.130.
Gibilisco, Paul F.: *See—*
Bash, Stephan R.; Di Rubbo, Salvatore R. L.; Gibilisco, Paul F.; and Mansdoerfer, Richard L., Jr., 5,463,677, Cl. 379-88.000.
Gibson, Steven L.: *See—*
Simpson, Miles S.; Kimura, Scott A.; and Gibson, Steven L., 5,463,422, Cl. 348-390.000.
Gibson, Warren K.: *See—*
Hager, Robert J.; Gibson, Warren K.; and Lyons, Oral G., 5,463,527, Cl. 361-685.000.
Giddings & Lewis, Inc.: *See—*
Sheldon, Paul C.; and Loerch, Richard J., 5,462,511, Cl. 483-1.000.
Gier, Achim R.: *See—*
Heckel, Robert J.; Fin, Enrico; Gier, Achim R.; and Bonduel, Pascal, 5,461,826, Cl. 49-28.000.
Giesemann, Reinhard: *See—*

  - Kastingschafer, Gerhard; Auf dem Venne, Johannes; Pingel, Herbert; Giesemann, Reinhard; Peterwerth, Bernhard; Gerhardt, Klaus; and Gebbe, Reinhold, 5,462,370, Cl. 384-549.000.
- Gil, Dong S.: *See—*
  - Kim, Jung C.; Oh, Dong Y.; Choe, Gyu S.; Hong, Kyung S.; Kim, Kyung H.; Lee, Joo H.; Lee, Ha I.; Park, Kyeong B.; Gil, Dong S.; Kwon, Oh H.; and Kwon, Byoung H., 5,461,886, Cl. 68-3.0SS.
- Gilbert, David P., to Plessey Semiconductors Limited. Tracker balls. 5,463,409, Cl. 345-167.000.
- Gilbert, Steven R.: *See—*
  - Minton, Gerald T.; Horwich, Lisa J.; and Gilbert, Steven R., 5,462,166, Cl. 206-440.000.
- Gill, Michael J., to British Gas PLC. Measurement system. 5,461,931, Cl. 73-861.280.
- Gillet, Claude L.: *See—*
  - Roba, Joseph L.; Gillet, Claude L.; Rafferty, Michael F.; Jarrott, Bevyn; and Beart, Philip M., 5,462,965, Cl. 514-443.000.
- Gillig, Steven F.; and Pederson, Glen E., to Motorola, Inc. Cellular cordless telephone which polls information in a memory to determine a pre-selected preference and a stored availability of call forwarding. 5,463,674, Cl. 379-59.000.
- Gimmler, Joachim, to Fichtel & Sachs AG. Hydrokinetic lockup torque converter with lockup clutch. 5,462,145, Cl. 192-3.290.
- Ginder, John M.: *See—*
  - Epstein, Arthur J.; Roe, Mitchell G.; Ginder, John M.; Hajiseyedjavadi, Hamid; and Joo, Jinsoo, 5,463,014, Cl. 528-210.000.
- Ginley, David S.: *See—*
  - Bhattacharya, Raghu N.; and Ginley, David S., 5,462,647, Cl. 205-74.000.
- Giovanniello, Rocco; and Ayala, Nelson P. Clear antiperspirant gel stick and method for making same. 5,463,098, Cl. 556-27.000.
- Giraud, Jean; and LeClaire, Daniel, to Rhone-Poulenc Nutrition Animale. Method for the crystallization of methionine. 5,463,120, Cl. 562-559.000.
- Gisel, Thomas: *See—*
  - Klee, Werner; and Gisel, Thomas, 5,462,239, Cl. 242-18.00R.
- Gist-brocades N.V.: *See—*
  - Groenen, Martinus A. M.; Veenstra, Annemarie E.; Van Solingen, Pieter; Koekman, Bertus P.; Van Der Voort, Lucia H. M.; Martin, Juan F.; Gutierrez, Santiago; Diez, Bruno; Alvarez, Emilio; Barredo, Jose L.; and Esmahan, Christina, 5,462,862, Cl. 435-69.100.
- Givens, Fenton L.: *See—*
  - Ingram, Paul M., Jr.; Johnson, James R.; and Givens, Fenton L., 5,462,357, Cl. 374-124.000.
- GKN Walterscheid GmbH: *See—*
  - Eidam, Manfred; Flanhardt, Michael; Rauschenbach, Stefan; and Roth, Andreas, 5,462,131, Cl. 180-14.400.
  - Langen, Hans-Jürgen; Vollmer, Jürgen; and Sarfert, Andreas, 5,462,303, Cl. 280-455.100.
- Glaser, Thomas: *See—*
  - Schohe, Rudolf; Glaser, Thomas; Traber, Jörg; and Allen, George S., 5,463,105, Cl. 560-29.000.
- Glenn, Daniel J.: *See—*
  - D'Angelo, Joseph P.; Schur, Henry B.; Han, Kedu; and Glenn, Daniel J., 5,462,064, Cl. 128-771.000.
- Glew, Andrew F.: *See—*
  - Vidwans, Rohit A.; Boggs, Darrell D.; Fetterman, Michael A.; and Glew, Andrew F., 5,463,745, Cl. 395-375.000.
- Glinecke, Robert: *See—*
  - Radebaugh, Galen W.; Julian, Thomas N.; and Glinecke, Robert, 5,462,747, Cl. 424-465.000.
- Glinski, Christophe: *See—*
  - Du Parc, Jacques; Glinski, Christophe; and Wursteisen, Michel, 5,463,653, Cl. 373-108.000.
- Glock, Steven R., to Biomet, Inc. Femoral sizing apparatus. 5,462,549, Cl. 606-86.000.
- Glodowski, Robert J.; and Wilson, Allyen E., III, to GS Technologies Corporation. Method and apparatus for producing steel rods with a desired tensile strength and model for simulating same. 5,462,613, Cl. 148-500.000.
- Glück, Joachim, to Luder, Ernst. Process for making a matrix of thin layer transistors with memory capacitors. 5,462,887, Cl. 437-48.000.
- Glyco-Metall-Werke Glyco B.V. & Co. KG: *See—*
  - Brandt, Horst, 5,462,365, Cl. 384-294.000.
- Glynn, Kenneth P., to Ideal Ideas, Inc. Child resistant overcap with safety collar. 5,462,181, Cl. 215-204.000.
- Gnann, Michael: *See—*
  - Roesler, Richard; Schelle, Siegfried; Gnann, Michael; and Zeiss, Werner, 5,462,692, Cl. 252-186.260.
- Godfrey, Jollie D., Jr.; Mueller, Richard H.; Sedergran, Thomas C.; and Soundararajan, Nachimuthu, to E. R. Squibb & Sons, Inc. Process for the preparation of intermediates useful in the preparation of pyranyl cyanoguanidine derivatives. 5,463,059, Cl. 546-21.000.
- Goebels, Hermann, to Robert Bosch GmbH. Electronic brake system for separately controlling nondriven front wheels and driven rear wheels. 5,462,342, Cl. 303-113.200.
- Goerenz, Edmund, to Dyko Industriekeramik GmbH. Process for producing a composite material comprising of at least two layers. 5,462,616, Cl. 156-85.000.
- Goffe, Randal A.: *See—*
  - Azad, A. R. M.; and Goffe, Randal A., 5,462,867, Cl. 435-181.000.
- Gogliotti, Rocco D.: *See—*
  - Elslager, Edward F.; and Gogliotti, Rocco D., 5,463,122, Cl. 564-82.000.
- Gohara, Wadie F., to Babcock & Wilcox Company, The. Accurate method of measure tray pressure drop to determine liquid flow in flue gas desulfurization systems. 5,461,912, Cl. 73-202.000.
- Goitz, Henry T.: *See—*
  - Rijke, Arie M.; and Goitz, Henry T., 5,462,068, Cl. 128-881.000.
- GOJO Industries, Inc.: *See—*
  - Lippman, Jerome; Dolan, Michael J.; Sullivan, John J., Jr.; and Viscovitz, John H., 5,462,688, Cl. 252-89.100.
- Goldberg, Martin: *See—*
  - Viehbeck, Alfred; Goldberg, Martin; Tisdale, Stephen L.; Buchwalter, Stephen L.; Grebe, Kurt R.; Kovac, Caroline A.; and Matthew, Linda C., 5,462,628, Cl. 156-281.000.
- Goldstar Co., Ltd.: *See—*
  - Kim, Jung C.; Oh, Dong Y.; Choe, Gyu S.; Hong, Kyung S.; Kim, Kyung H.; Lee, Joo H.; Lee, Ha I.; Park, Kyeong B.; Gil, Dong S.; Kwon, Oh H.; and Kwon, Byoung H., 5,461,886, Cl. 68-3.0SS.
  - Koo, Hee S., 5,463,433, Cl. 353-84.000.
- Goldstein, Joel E.: *See—*
  - Pinschmidt, Robert K., Jr.; Dixon, Dale D.; Burgoyne, William F., Jr.; and Goldstein, Joel E., 5,463,007, Cl. 526-266.000.
- Goldstein, Steven W.; and McDermott, Ruth E., to Pfizer Inc. Hypoglycemic hydroxyurea derivatives. 5,463,070, Cl. 548-236.000.
- Goledzinowski, Maciej; and Birss, Viola I., to Canada, Her Majesty the Queen in right of, as represented by the Minister of Energy, Mines and Resources. Oligomerization of low molecular weight olefins in ambient temperature melts. 5,463,158, Cl. 585-520.000.
- Gollin, Walter: *See—*
  - Kugler, Karl-Heinz; Gollin, Walter; Riedel, Karlheinz; and Zimmermann, Christian, 5,462,036, Cl. 123-609.000.
- Golovin, M. Neal: *See—*
  - Chaloner-Gill, Benjamin; and Golovin, M. Neal, 5,463,179, Cl. 429-192.000.
- Goltz, Norbert: *See—*
  - Hebisch, Heinz; Brehmer, Hans-Heinrich; Goltz, Norbert; and Rothenstein, Uwe, 5,463,169, Cl. 588-202.000.
- Gondouin, Michel, to S-Cal Research Corp. Downhole equipment, tools and assembly procedures for the drilling, tie-in and completion of vertical cased oil wells connected to liner-equipped multiple drainholes. 5,462,120, Cl. 166-380.000.
- Goodin, Mark S.: *See—*
  - Haworth, William S.; Olsen, Robert W.; and Goodin, Mark S., 5,462,619, Cl. 156-172.000.
- Goodyear Tire & Rubber Company, The: *See—*
  - Ngoc, Hung D.; and Salazar, Mariano, 5,462,993, Cl. 525-274.000.
  - Sandstrom, Paul H., 5,462,979, Cl. 523-438.000.
  - Saupe, Timothy P., 5,462,091, Cl. 138-126.000.
- Gorham, Thomas R.: *See—*
  - Evenstad, Kenneth L.; O'Neill, Victoria A.; and Gorham, Thomas R., 5,462,740, Cl. 424-436.000.
- Goserud, J. Thomas. Self-framing display holder for flat objects. 5,461,810, Cl. 40-661.000.
- Goss, David, to Textron Inc. Back-side taper wedging drive system. 5,461,952, Cl. 81-460.000.
- Goto, Giichi; Miyamoto, Masaomi; and Ishihara, Yuji, to Takeda Chemical Industries. Condensed heterocyclic ketone derivatives and their use. 5,462,934, Cl. 514-183.000.
- Goto, Hiroyuki, to NEC Corporation. Semiconductor integrated circuit device. 5,463,560, Cl. 364-489.000.
- Goto, Iwao: *See—*
  - Yamazaki, Hiraku; Sugai, Teruo; Kato, Shigeo; Tazoe, Haruo; Hotate, Shiroh; and Goto, Iwao, 5,462,800, Cl. 428-408.000.
- Goto, Masahiro: *See—*
  - Inoue, Takahiro; Goto, Masahiro; Sasame, Hiroshi; Tsukida, Shinichi; and Takano, Manabu, 5,463,450, Cl. 355-219.000.
- Goto, Yuichiro; Kasa, Hideki; and Harada, Takatomo, to Gas Research Institute. Electro-fusion fitting having a solid embedded heater with perpendicular projections. 5,462,314, Cl. 285-21.000.
- Gottschalk, Donald A., Jr.: *See—*
  - Pascucci, Gregory A.; Rasmussen, David E.; Decious, Gaylon M.; Garbe, James R.; Hyzer, Susan M.; Woest, Karen L.; Vairavan, Vairavan; Koch, David L.; Gottschalk, Donald A., Jr.; Burkhardt, Dennis E.; Standish, Darrell E.; Madaus, Paul W.; Spacek, Dan J.;, 5,463,735, Cl. 395-200.100.
- Gourbier, Jean-Pierre: *See—*
  - Bracque, Gilles; Dehaine, Francois; Gourbier, Jean-Pierre; Gourdain, Daniel; Grelaud, Alain; Guillard, Alain; and Mouliney, Michel, 5,461,871, Cl. 62-24.000.
- Gourdain, Daniel: *See—*
  - Bracque, Gilles; Dehaine, Francois; Gourbier, Jean-Pierre; Gourdain, Daniel; Grelaud, Alain; Guillard, Alain; and Mouliney, Michel, 5,461,871, Cl. 62-24.000.
- Grabher, Günther, to Grass AG. Drawer with drawer side slide and drawer bottom. 5,462,349, Cl. 312-348.100.
- Grace, James W.; and DiPietro, David M., to Hewlett-Packard Company. Spike suppression for a tester circuit for integrated circuits. 5,463,315, Cl. 324-158.100.
- Grady, Robert W.: *See—*
  - Clarkson, Allen B., Jr.; and Grady, Robert W., 5,462,969, Cl. 514-575.000.

Graebe, Robert H. Modular cushion construction with foamed base. 5,461,741, Cl. 5-654.000.

Graetzel, Michael; and Nazeeruddin, Mohammad K., to Ecole Polytechnique Federale de Lausanne, (EPFL). Bi-pyridyl-rumetal complexes. 5,463,057, Cl. 546-4.000.

Graham-Meighan, Margaret: *See—*
Berry, James E.; Pace, Gary L.; Herold, Barry W.; McLaughlin, Kevin; and Graham-Meighan, Margaret, 5,463,306, Cl. 323-222.000.

Grain Systems, Inc.: *See—*
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Grandclement, Charly; and Magnin, Bruno, to Grosfillex S.A.R.L. Table in plastic material. 5,461,989, Cl. 108-153.000.

Granger, Edward M. Blue noise based technique for use in a halftone tile oriented screener for masking screener induced image artifacts. 5,463,720, Cl. 395-109.000.

Grasel, Timothy G.: *See—*
Braatz, James A.; Kehr, Clifton L.; Grasel, Timothy G.; and Letter, William S., 5,462,536, Cl. 604-304.000.

Grass AG: *See—*
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Grau, Alfred: *See—*
Bidese, Werner; Fritschi, Hans-Rudolf; and Grau, Alfred, 5,463,680, Cl. 379-165.000.

Gray, Clifford R. Cutter bit for use in drilling operations. 5,462,128, Cl. 175-339.000.

Gray, Craig S., to Delco Electronics Corporation. Method and apparatus for random frequency of tube filament current. 5,463,278, Cl. 315-169.100.

Gray, John C.; and Shultz, Duane E., to L & H Threaded Rods Corp. U-bolt bending apparatus. 5,461,897, Cl. 72-213.000.

Graybill, Todd L.: *See—*
Dolle, Roland E.; Graybill, Todd L.; Speier, Gary J.; Prouty, Catherine P.; and Schmidt, Stanley J., 5,462,939, Cl. 514-231.500.

Greb, Wolfgana: *See—*
Bahrmann, Helmut; Greb, Wolfgana; Heymanns, Peter; Lappe, Peter; Müller, Thomas; Szameitat, Jürgen; and Wiebus, Ernst, 5,462,986, Cl. 524-296.000.

Greb, Wolfgang: *See—*
Bahrmann, Helmut; Greb, Wolfgang; Heymanns, Peter; Lappe, Peter; Müller, Thomas; Szameitat, Jürgen; and Wiebus, Ernst, 5,463,147, Cl. 568-882.000.

Grebe, Kurt R.: *See—*
Viehbeck, Alfred; Goldberg, Martin; Tisdale, Stephen L.; Buchwalter, Stephen L.; Grebe, Kurt R.; Kovac, Caroline A.; and Matthew, Linda C., 5,462,628, Cl. 156-281.000.

Grebius, Jan: *See—*
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Green, Barrie E. Hydrophobic yarn filter fabric for a concrete press mould. 5,462,665, Cl. 210-496.000.

Green, Charlie W.; and Jaco, Paul R. Fly-catcher with bait. 5,461,822, Cl. 43-122.000.

Green Cross Corporation, The: *See—*
Iwao, Toru; Hirai, Kenichi; Kondoh, Nobuo; Yamanouchi, Koichi; and Yokoyama, Kazumasa, 5,462,951, Cl. 514-334.000.

Green, David T.: *See—*
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Green, Frederick A.: *See—*
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Green, Michael J.: *See—*
Shih, Neng-Yang; Aslanian, Robert; Lupo, Andrew, Jr.; Piwinski, John J.; Green, Michael J.; and Ganguly, Ashit K., 5,463,074, Cl. 548-314.700.

Green, Rick L.: *See—*
Ambler, Robert D.; and Green, Rick L., 5,462,135, Cl. 182-187.000.

Green, Robert R.; and Ireland, Kelly D., to Baker Hughes Incorporated. Tubing conveyed perforating system with fluid loss control. 5,462,117, Cl. 166-297.000.

Greenberg, Michael J.: *See—*
Synosky, Steven P.; Greenberg, Michael J.; and McGrew, Gordon N., 5,462,754, Cl. 426-4.000.

Greene, Andrew E.: *See—*
Correa, Arlene G.; Denis, Jean-Noel; and Greene, Andrew E., 5,463,106, Cl. 560-39.000.

Greene, Kenneth L. Omni-direction vibration dampening lampholder assembly. 5,463,541, Cl. 362-369.000.

Greenleaf, Suzanne M.; and Cifuentes, Martin E., to Dow Corning Corporation. Silicone containing automotive vinyl protectant. 5,462,587, Cl. 106-2.000.

Greenlund, Andrew C.: *See—*
Schreiber, Robert D.; Greenlund, Andrew C.; and Farrar, Michael A., 5,463,023, Cl. 530-327.000.

Greenwell, Andrew J. Semiautomatic paint ball gun. 5,462,042, Cl. 124-76.000.

Greenwood, Gil J.: *See—*
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Greer, Dana J.: *See—*
Kepley, Walter R., III; Greer, Dana J.; and Shields, Richard A., Jr., 5,463,678, Cl. 379-91.000.

Gregory, James L.; Burzynski, Dennis J.; Rote, Bruce J.; and Sprowl, Frank L., to Owens-Illinois Closure Inc. Plastic beverage closure. 5,462,187, Cl. 215-350.000.

Grelaud, Alain: *See—*
Bracque, Gilles; Dehaine, Francois; Gourbier, Jean-Pierre; Gourdain, Daniel; Grelaud, Alain; Guillard, Alain; and Mouliney, Michel, 5,461,871, Cl. 62-24.000.

Gresl, Charles, to Origin Medsystems, Inc. Trocar with safety sensing sleeve. 5,462,532, Cl. 604-164.000.

Gretxhev, Val: *See—*
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Grewal, Gurmit: *See—*
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Griffin, Arthur T., Jr. Combustor cooling for gas turbine engines. 5,461,854, Cl. 60-39.050.

Griffin Corporation: *See—*
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Griffin, John R.; DeChellis, Marc L.; and Muhle, Michael E., to Exxon Chemical Patents Inc. Process for polymerizing monomers in fluidized beds. 5,462,999, Cl. 526-68.000.

Griffin, Maurice J.; and Sugawara, Glenn S., to United States of America, Navy. Arbitrary waveform generator. 5,463,334, Cl. 327-106.000.

Grigsby, John M.; and Doerr, Daniel H. Cleated corrugated paperboard container. 5,462,218, Cl. 229-23.00C.

Grill, Alfred; and Patel, Vishnubhai V., to International Business Machines Corporation. Fluorinated diamond-like carbon protective coating for magnetic recording media devices. 5,462,784, Cl. 428-65.500.

Grimes, Gary J., to AT&T IPM Corp. Distribution of clock signals by pump power modulation in an optically amplified network. 5,463,488, Cl. 359-128.000.

Grimes, Gary J.; and Quinn, Thomas M., to AT&T IPM Corp. Integrated wireless telecommunication and local area network system. 5,463,623, Cl. 370-79.000.

Grimes, Glenn R.: *See—*
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Grimes, John A., to Davidson Textron Inc. Automobile door having interior trim panel with air flow control opening. 5,462,482, Cl. 454-143.000.

Grinvald, Amiram. Image acquisition and enhancement method and system. 5,463,426, Cl. 348-625.000.

Grisoni, Serge: *See—*
Achard, Daniel; Grisoni, Serge; Malleron, Jean-Luc; Peyronel, Jean-Francois; and Tabart, Michel, 5,463,077, Cl. 548-515.000.

Groenen, Martinus A. M.; Veenstra, Annemarie E.; Van Solingen, Pieter; Koekman, Bertus P.; Van Der Voort, Lucia H. M.; Martin, Juan F.; Gutierrez, Santiago; Diez, Bruno; Alvarez, Emilio; Barredo, Jose L.; and Esmahan, Christina, to Gist-brocades N.V. Method and compositions for enhancing production of secondary metabolites using clustered biosynthetic genes. 5,462,862, Cl. 435-69.100.

Groeneveld, Peter W.: *See—*
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Grosfillex S.A.R.L.: *See—*
Grandclement, Charly; and Magnin, Bruno, 5,461,989, Cl. 108-153.000.

Grosjean, Francois: *See—*
Huvey, Michel; Grosjean, Francois; and Montabord, Lucien, 5,462,774, Cl. 427-555.000.

Gross, Yael: *See—*
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Grube, Gary W.; Bunkenburg, Brian K.; and Naddell, Marc C. Method for providing caller interrupt in a time division multiplexed wireless communication system. 5,463,617, Cl. 370-29.000.

Gruen, Dieter M. Conversion of fullerenes to diamonds. 5,462,776, Cl. 427-577.000.

Gruender, Eugene H., Jr.; Clark, C. W.; and Kraft, Douglas R., to Motorola, Inc. Method and system for automatic configuration of memory devices. 5,463,589, Cl. 365-230.010.

GS Technologies Corporation: *See—*
Glodowski, Robert J.; and Wilson, Allyen E., III, 5,462,613, Cl. 148-500.000.

Gschneidner, Karl A., Jr.; and Takeya, Hiroyuki, to Iowa State University Research Foundation, Inc. Lanthanide Al-Ni base Ericsson cycle magnetic refrigerants. 5,462,610, Cl. 148-301.000.

Gschwind, Michel; and Ancey, Pascal, to Imra Europe SA. Peltier effect device to detect in particular a condensation risk on a surface being in contact with a wet air volume. 5,462,608, Cl. 136-203.000.

GSI Engineering, Inc.: *See—*
Jones, William C., Jr.; Polley, Richard B.; and Sanzo, Roger F., 5,462,139, Cl. 188-206.00R.

GTE California Incorporated: *See—*
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Guanella, Italo: *See—*
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Guaranteed Baffle Co., Inc.: *See—*
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Guard, Glenn B., to Westinghouse Electric Corp. Method and apparatus for enhancing signal-to-noise ratio and improving sensitivity and signal detector employing same. 5,463,342, Cl. 327-269.000.
Guardiola, Pierre-Henri; Iv, Van-Tha; Metzger, Albert; Cleon, Louis-Marie; and Dannawi, Marwan, to Gec Alsthom Transport Sa. Impact-absorber device. 5,462,144, Cl. 188-377.000.
Gueret, Jean-Louis H., to L'Oreal. Brush for applying a liquid product as a layer on a substrate. 5,462,798, Cl. 428-364.000.
Guess, Robert G., to Romar Technologies, Inc. Process for removing oils and greases from aqueous solution. 5,462,670, Cl. 210-713.000.
Guido, Heinz, to Man Gutehoffnungshutte Aktiengesellschaft. Tilting device for a D.C. arc furnace and process for emptying the furnace. 5,462,259, Cl. 266-45.000.
Guilford Mills, Inc.: *See—*
  Depoe, Ronald L.; and Voshell, Sheila W., 5,461,884, Cl. 66-170.000.
Guillard, Alain: *See—*
  Bracque, Gilles; Dehaine, Francois; Gourbier, Jean-Pierre; Gourdain, Daniel; Grelaud, Alain; Guillard, Alain; and Mouliney, Michel, 5,461,871, Cl. 62-24.000.
Gulick, Kenneth: *See—*
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Günther, Christian: *See—*
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Günther, Hubert: *See—*
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Gupta, Rajiv; Halim, Raouf; and Shamlou, Daryush, to Rockwell International Corporation. Supply sensing power-on reset circuit. 5,463,336, Cl. 327-143.000.
Gupte, Arun R.; Rohr, Uwe; and Zierenberg, Bernd, to Boehringer Ingelheim KG. Transdermal system for the administration of pharmacological compounds under pH-controlled conditions. 5,462,744, Cl. 424-448.000.
Güstävel, Andreas; Horstkötter, Ralf; Schlenz, Rolf; and Strunk, Harald, to Gebr. Happich GmbH. Apparatus for the manufacture of a plastic molded part. 5,462,422, Cl. 425-129.100.
Gutierrez, Marty R., to Shamus. Vehicle body repair tool. 5,461,900, Cl. 72-479.000.
Gutierrez, Santiago: *See—*
  Groenen, Martinus A. M.; Veenstra, Annemarie E.; Van Solingen, Pieter; Koekman, Bertus P.; Van Der Voort, Lucia H. M.; Martin, Juan F.; Gutierrez, Santiago; Diez, Bruno; Alvarez, Emilio; Barredo, Jose L.; and Esmahan, Christina, 5,462,862, Cl. 435-69.100.
Gutzmann, Timothy A.; and Altier, Mark R., to Ecolab, Inc. Particulate suspending antimicrobial additives. 5,462,681, Cl. 252-11.000.
Guzzi, Umberto; Palmieri, Costantino; and Croci, Tiziano, to Sanofi. N-substituted trifluoromethylphenyltetrahydropyridines, process for the preparation thereof, intermediates in said process and pharmaceutical compositions containing them. 5,462,945, Cl. 514-277.000.
H. Lundbeck A/S: *See—*
  Perregaard, Jens K.; and Costall, Brenda, 5,462,948, Cl. 514-323.000.
Habu, Yukiko: *See—*
  Araki, Morio; Hayashi, Katsuyoshi; and Habu, Yukiko, 5,463,553, Cl. 364-444.000.
  Araki, Morio; Hayashi, Katsuyoshi; and Habu, Yukiko, 5,463,554, Cl. 364-444.000.
Hacker, Thomas G.: *See—*
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Hadank, John M.: *See—*
  Boen, Charles G.; Hadank, John M.; McGuire, Kenneth J.; Schricker, David R.; and Scholl, Rolland D., 5,463,567, Cl. 364-551.010.
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Haefner, Kenneth B.: *See—*
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Haffner, Eugene F.; and Rios, Luz, to Owens-Illinois Closure Inc. Liquid containing and dispensing package. 5,462,202, Cl. 222-109.000.
Haga, Nobuhiro; Inagaki, Masanao; Matsumoto, Saichi; and Kamata, Susumu, to Shionogi & Co., Ltd. Method for producing benzylidene derivatives. 5,463,052, Cl. 544-2.000.
Hagedorn, Ferdinand; Fiege, Helmut; and Traenckner, Hans-Joachim, to Bayer Aktiengesellschaft. Process for desulphurizing organic mercapto and/or disulphide compounds. 5,463.068, Cl. 548-152.000.
Hagemann, Hermann: *See—*
  Scherkenbeck, Jürgen; Himmler, Thomas; Böhm, Stefan; Hagemann, Hermann; Stroech, Klaus; Dutzmann, Stefan; Dehne, Heinz-Wilhelm; and Hänssler, Gerd, 5,462,955, Cl. 514-383.000.
Hagemeyer, Alfred; Schildberg, Hans-Peter; Hibst, Hartmut; Baeuerle, Dieter; and Heitz, Johannes, to BASF Magnetics GmbH. Sheet-like polyethylene terephthalate materials having slight surface roughness, their preparation and their use. 5,462,701, Cl. 264-482.000.
Hagenuk Fahrzeugklima GmbH: *See—*
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Hager, Robert J.; Gibson, Warren K.; and Lyons, Oral G., to Allen-Bradley Company, Inc. Suspension system for disk drives utilizing shear loaded elastomeric supports of different durometer hardnesses and elastomeric pads. 5,463,527, Cl. 361-685.000.
Hagiwara, Tatsuya: *See—*
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Hagiwara, Toshimitsu: *See—*
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Hahn, Stephen: *See—*
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Hajek, Michael L., to Hajek, Michael L. Wild game dressing tool. 5,462,479, Cl. 452-160.000.
Hajiseyedjavadi, Hamid: *See—*
  Epstein, Arthur J.; Roe, Mitchell G.; Ginder, John M.; Hajiseyedjavadi, Hamid; and Joo, Jinsoo, 5,463,014, Cl. 528-210.000.
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Halaburda, Daniel J.; Dombrowski, David; and Valls, William H., to Matsushita Electric Corporation of America. Battery container and display package. 5,462,161, Cl. 206-705.000.
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Hall, Bryan C., to Siemens Automotive L.P. Coil for small diameter welded fuel injector. 5,462,231, Cl. 239-585.400.
Hall, David B., to Litton Systems, Inc. Combining optics for ring laser gyro. 5,463,652, Cl. 372-94.000.
Hall, John T.; and Tanzer, Herbert J., to Hughes Aircraft Company. Multilayer separate windings of inductive charge coupler for automobile battery charging transformer. 5,463,303, Cl. 320-2.000.
Hall, Kenneth R.; Morrison, Gerald L.; and Holste, James C., to Texas A & M University System. Slotted orifice flowmeter. 5,461,932, Cl. 73-861.610.
Halle, Richard W.; Davis, Donna S.; and Harris, Charles R., Jr., to Exxon Chemical Patents Inc. Heat sealable films and articles. 5,462,807, Cl. 428-500.000.
Halliburton Energy Services, Inc.: *See—*
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Halliburton Logging Services, Inc.: *See—*
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Halloran, Timothy, to Loral Aerospace Corp. Wideband vector modulator which combines outputs of a plurality of QPSK modulators. 5,463,355, Cl. 332-103.000.
Halnon, Jeffrey J.: *See—*
  Lipton, Lenny; Halnon, Jeffrey J.; Mitchell, Larry H.; and Hursey, Robert, 5,463,428, Cl. 351-158.000.
Halpert, David E.: *See—*
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Hamada, Shinji, to Ikeda Bussan Co., Ltd. Airbag restraint unit. 5,462,305, Cl. 280-728.200.
Hamada, Toshimitsu: *See—*
  Ichinose, Toshiaki; Ninomiya, Takanori; Kuni, Asahiro; Nakahata, Kozo; Hamada, Toshimitsu; and Ayabe, Toshihiko, 5,463,667, Cl. 378-58.000.
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Hamauchi, Tetsuji, to NEC Corporation. Break function in-circuit emulator for a microprocessor with a cache memory. 5,463,760, Cl. 395-500.000.
Hamilton, Melissa A.: *See—*
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Handel, Ulrich; and Kirchner, Joachim, to Karl Mayer Textilmashinenfabrik GmbH. Arrangement for driving a warp beam. 5,461,881, Cl. 66-210.000.
Handke, Günther; Wirth, Alfred; and Zietsch, Andreas, to Fichtel & Sachs AG. Fluid operated damper with nonreleasable cover unit for electromagnetic value. 5,462,142, Cl. 188-299.000.
Hanna, Marie R.: *See—*

Monteleone, Michael G.; Weiss, Richard A.; Evans, Mark D.; and Hanna, Marie R., 5,462,923, Cl. 512-19.000.

Hanna, Paul E. Method of producing a mold open riser in mold during casting. 5,462,106, Cl. 164-15.000.

Hannah, Jacquilyn K. Fireplace log dispensing apparatus. 5,462,046, Cl. 126-501.000.

Hansen, Erling, to Swager, Ronald W. Method of facetting a gem. 5,462,474, Cl. 451-41.000.

Hanson, Robert L.: *See—*

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Seitz, Thomas; Klausener, Alexander; Berg, Dieter; Wachendorff-Neumann, Ulrike; Erdelen, Christoph; Hänssler, Gerd; Brandes, Wilhelm; and Dutzmann, Stefan, 5,462,943, Cl. 514-256.000.

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Hara, Koji; Fujita, Koki; Kuwahara, Nobuhiro; Kitahata, Sumio; and Koizumi, Kyoko, to Ensuiko Sugar Refining Co., Ltd.; Osaka-shi; and Kyoko Koizumi. Method of preparing hetero-branched cyclodextrins. 5,463,039, Cl. 536-124.000.

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Hara, Ryuichi; Nagayama, Atsuo; and Kumiya, Hidetoshi, to Fanuc, Ltd. Circular tracking method for robot. 5,463,297, Cl. 318-568.130.

Hara, Tomihiro: *See—*

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Harada, Chikao: *See—*

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Harada, Hiroshi: *See—*

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Harada, Takatomo: *See—*

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Hardigg Industries, Inc.: *See—*

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Hardigg, James S.; and Aponte, Rene R., to Hardigg Industries, Inc. Lightweight handle. 5,461,755, Cl. 16-112.000.

Hardwick, Austin. Magnetically attachable, portable, adjustable, and collapsible safe drilling mount for steel safes. 5,462,392, Cl. 408-76.000.

Harigaya, Isao; Mogi, Hirokazu; Kozuki, Susumu; Iijima, Ryunosuke; Toyama, Masamichi; and Hirasawa, Masahide, to Canon Kabushiki Kaisha. Interchangeable lens unit for use in camera system. 5,463,442, Cl. 354-400.000.

Hariu, Yukari: *See—*

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Lob, Charles J., 5,462,368, Cl. 384-512.000.

Harlan, Robert D.; and Landoll, Donald R., to Landoll Corporation. Tillage implement with on-the-go depth control of angle adjustable disc gangs. 5,462,123, Cl. 172-454.000.

Harlan, Tod M.: *See—*

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Harmon, David L.: *See—*

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Harris, Charles R., Jr.: *See—*

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Harris Corporation: *See—*

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Temple, Victor A. K., 5,463,344, Cl. 327-374.000.

Harris, Jesse. Apparatus for aiding erections in males. 5,462,514, Cl. 600-38.000.

Harris, Richard H.: *See—*

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Harrison, Brian H.: *See—*

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Harrison, James R.: *See—*

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Hart, Michele A.: *See—*

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Hart, Raymond F.; and Hart, Michele A. Aircraft passenger window maintenance shield. 5,462,243, Cl. 244-121.000.

Hartog, Jan; Van Steen, Bartholomeus J.; Mos, Johannes; and Schipper, Jacques, to Duphar International Research B.V. 2,3-dihydro-1,4-benzodioxin-5-yl-piperazine derivatives having 5-HT 1A-antagonistic activity. 5,462,942, Cl. 514-254.000.

Harvey, Dennis N.; and Jenniges, Randal L., to MTS System Corporation. Optical motion sensor. 5,463,463, Cl. 356-375.000.

Harvey Universal, Inc.: *See—*

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Hase, Kenichi: *See—*

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Hasegawa, Kazsuya, to Kabushiki Kaisha Meidensha. Synthesis of speech from text. 5,463,713, Cl. 395-2.690.

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Hasegawa, Shigeru: *See—*

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Hasegawa, Takehiro: *See—*

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Hasegawa, Tamotsu; Arakawa, Yasuyuki; and Ota, Atushi, to Toyota Jidosha Kabushiki Kaisha. Vacuum casting method. 5,462,107, Cl. 164-63.000.

Hasegawa, Yusuke; and Maki, Hidetaka, to Honda Giken Kogyo Kabushiki Kaisha. A/F ratio estimator for multicylinder internal combustion engine. 5,462,037, Cl. 123-673.000.

Hashimoto, Akira; and Miwa, Hiroshi, to Mitsubishi Denki Kabushiki Kaisha. Magnetic disk apparatus. 5,463,512, Cl. 360-104.000.

Hashimoto, Ken: *See—*

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Hashimoto, Takayoshi: *See—*

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Hashimoto, Takeo: *See—*

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Hashimoto, Toshikuni: *See—*

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Hassler, Stephen P.; Johnson, Stephen P.; and Lapp, John, to Cooper Industries, Inc. Current limiting fuse and dropout fuseholder. 5,463,366, Cl. 337-176.000.

Hastie, Neil S., to Plessey Semiconductors Limited. Programmable multiplexer logic cell. 5,463,327, Cl. 326-37.000.

Hata, Tsunehisa: *See—*

Katoh, Hisashi; Nakajima, Tadayoshi; Hata, Tsunehisa; Miyano, Hideyo; and Koda, Shinsuke, 5,462,108, Cl. 164-98.000.

Hatada, Koji, to Dainippon Screen Mfg., Co., Ltd. Method and apparatus for selecting and displaying a process during prepress processing of an image. 5,463,730, Cl. 395-161.000.

Hatakenaka, Nobuko: *See—*

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Hatley, Charles A.; and Atchison, Deborah A. Therapeutic spinal traction apparatus and multipurpose exercise systems and methods. 5,462,518, Cl. 602-36.000.
Hauni Maschinenbau AG: *See—*
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Hauquier, Guido; Cortens, Willem; Coppens, Paul; Vermeersch, Joan; Mostaert, Erik; and Verschueren, Eric, to Agfa-Gevaert, N.V. Lithographic base and a method for making a lithographic printing plate therewith. 5,462,833, Cl. 430-159.000.
Hauser, Gary E.: *See—*
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Hauser, Helmut. Method of diagnosing irregularities in bile salt absorption via brush border membrane proteins. 5,462,859, Cl. 435-29.000.
Häusler, Oskar, to Ina Walzlager Schaeffler KG. Crankshaft bearing. 5,462,366, Cl. 384-457.000.
Havlicsek, Howard S., to Acutronic AG. Method and apparatus for correcting errors in an amplitude encoded signal. 5,463,393, Cl. 341-115.000.
Hawera Probst GmbH: *See—*
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Hawman, Peggy C.; Qian, Jianzhong; and Treffert, Jon D., to Siemens Medical Systems, Inc. High-sensitivity spect imaging of small body organs using a multi-headscintillation camera with non-uniform collimation. 5,462,056, Cl. 128-659.000.
Haworth, William S.; Olsen, Robert W.; and Goodin, Mark S., to Avecor Cardiovascular, Inc. Mass transfer device having a hollow fiber bundle. 5,462,619, Cl. 156-172.000.
Hawryszkow, Michael G.: *See—*
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Hayakawa, Isao; Atarashi, Shohgo; Kimura, Yoichi; and Kawakami, Katsuhiro, to Daiichi Pharmaceutical Co., Ltd. Optically active pyridobenzoxazine derivatives. 5,463,053, Cl. 544-101.000.
Hayashi, Katsuyoshi: *See—*
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Hayashi, Kiyotaka: *See—*
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Hayashi, Masaharu, to Kao Corporation. Feed additive for livestock and feed for livestock. 5,462,967, Cl. 514-547.000.
Hayashi, Ryotaro, to Fujitsu Limited. Apparatus and method for testing a buffer memory device which checks whether data is valid or invalid. 5,463,637, Cl. 371-21.100.
Hayashi, Tetsuyoshi: *See—*
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Hayashida, Haruo; Ichige, Akihiro; Ogawa, Tadatoshi; Yamada, Takeshi; Tada, Teruo; Zenigame, Masaaki; Wano, Toyoki; and Kondo, Kazuo, to Sumitomo Chemical Company, Limited; and Kura Industrial Company, Limited. Wrapping multilayer film. 5,462,777, Cl. 428-2.000.
Hayes, Deborah E.: *See—*
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Truckenbrod, Thomas G.; and Ramp, Benjamin E., 5,462,174, Cl. 209-394.000.
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Heaton, Dale A., to Texas Instruments Incorporated. Impedance matching network for low output impedance devices. 5,463,359, Cl. 333-32.000.
Hebisch, Heinz; Brehmer, Hans-Heinrich; Goltz, Norbert; and Rothenstein, Uwe, to Buck Werke GmbH & Co. Process for destroying pyrotechnic material. 5,463,169, Cl. 588-202.000.
Hecht, Hans, to Robert Bosch GmbH. Substrate. 5,462,789, Cl. 428-209.000.
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Heckel, Robert J.; Fin, Enrico; Gier, Achim R.; and Bonduel, Pascal, to Rockwell Body and Chassis Systems. Safety device for electrical openers for a vehicle. 5,461,826, Cl. 49-28.000.
Hecker, Gabriele: *See—*
Bischoff, Erwin; Gao, Zhan; Wohlfeil, Stefan; Hecker, Gabriele; Cleophax, Jeannine; Dubreuil, Didier; Gero, Stéphane; Olesker, Alice; Verre-Sebrie, Catherine; Vieira de Almeida, Mauro; and Vass, Georges, 5,463,087, Cl. 549-336.000.
Hedengren, Kristina H. V.; and Haefner, Kenneth B., to Generla Electric Company. Seam-tracking apparatus for a welding system employing an array of eddy current elements. 5,463,201, Cl. 219-121.830.
Hefner, Robert E., Jr.: *See—*
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Heinrich, Karl: *See—*
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Heiskell, Ronald E.: *See—*
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Heitmann, Uwe, to Hauni Maschinenbau AG. Cooling system for production units in plants of the tobacco processing industry. 5,462,071, Cl. 131-280.000.
Heitz, Johannes: *See—*
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Hemmerle, Horst; Schindler, Peter; and Herling, Andreas, to Hoechst Aktiengesellschaft. Substituted cyclohexane derivatives, processes for their preparation and the use of the compounds for treating diseases. 5,463,062, Cl. 546-168.000.
Henager, Charles H., Jr.; and Hirth, John P., to Battelle Memorial Institute. Process for producing dispersed particulate composite materials. 5,462,902, Cl. 501-92.000.
Henckel, Jonathan D.; and Hospers, Paul A., to International Business Machines Corp. Data processing system graphical user interface which emulates printed material. 5,463,725, Cl. 395-155.000.
Henderson, Greg. New style trim knife. 5,461,783, Cl. 30-124.000.
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Hendriksen, Dan E.; McGlamery, Gerald G.; Keenan, Michael J.; and Pete, Derrick D., to Exxon Chemical Patents, Inc. Process for preparing 3-methyl-2-pentene. 5,463,157, Cl. 585-511.000.
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Hendry, George: *See—*
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Hering, Jürgen; Johnen, Rolf; and Upper, Gerd, to Dichtungstechnik G. Bruss GmbH & Co. KG. Method for the manufacture of a shaft seal. 5,462,287, Cl. 277-37.000.

Hering, Jürgen; Johnen, Rolf; and Upper, Gerd, to Dichtungstechnik G. Bruss GmbH & Co. KG. Shaft seal assembly. 5,462,288, Cl. 277-37.000.

Hering, Thomas: *See—*

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Hemmerle, Horst; Schindler, Peter; and Herling, Andreas, 5,463,062, Cl. 546-168.000.

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Hermann, Robert A.: *See—*

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Herscovici, Bernard, to Northern Telecom Limited. In-building radio deployment technique for wireless personal communications systems. 5,463,673, Cl. 379-59.000.

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Herzfeld, Robert W.: *See—*

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Thompson, Bruce A.; Van Maren, David J.; McCarthy, John G.; Purcell, R. Andrew; and Rottinghaus, Michael, 5,463,772, Cl. 395-600.000.

Voigt, Douglas L.; and Jacobson, Michael B., 5,463,776, Cl. 395-600.000.

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Wardwell, Robert H.; and Airhart, Durwood, 5,463,324, Cl. 324-754.000.

Heyler, Adolf, to Orka Optik GmbH. Mounting housing made of plastic for pointer-type measuring units. 5,461,915, Cl. 73-431.000.

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Hidano, Tetsuhiro; Takeda, Hiroyuki; Tsukada, Masayuki; Yamamoto, Kazuo; and Inoue, Atsushi, to Hokuren Federation of Agricultural Cooperatives, The. Method of producing kestose crystals. 5,463,038, Cl. 536-124.000.

Higashi, Taketoshi: *See—*

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Hill, David C., to Navitrak Corp. Navigation aid with biangulation. 5,461,792, Cl. 33-1.0SD.

Hill, Jason J., to Emerson Electric Co. Slip clutch linear actuator. 5,461,935, Cl. 74-424.80R.

Hill, Joe T.; Williams, John R.; and Utter, Robert E., to American Standard Inc. Pressure biased co-rotational scroll apparatus with enhanced lubrication. 5,462,419, Cl. 418-55.400.

Hills, Inc.: *See—*

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Hills, William H., to Hills, Inc. Improved apparatus for continuous polymer filtration. 5,462,653, Cl. 210-85.000.

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Himmelsbach, Frank; Linz, Guenter; Austel, Volkhard; Pieper, Helmut; Mueller, Thomas; Weisenberger, Johannes; and Seewaldt-Becker, Elke, to Dr. Karl Thomae GmbH. 5-membered heterocyclic compounds, processes for preparing them and pharmaceutical compositions containing these compounds. 5,463,071, Cl. 548-251.000.

Himmler, Thomas: *See—*

Scherkenbeck, Jürgen; Himmler, Thomas; Böhm, Stefan; Hagemann, Hermann; Stroech, Klaus; Dutzmann, Stefan; Dehne, Heinz-Wilhelm; and Hänssler, Gerd, 5,462,955, Cl. 514-383.000.

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Hinkle, Luke D.; and Provost, James, to MKS Instruments, Inc. Differential current thermal mass flow transducer. 5,461,913, Cl. 73-204.250.

Hintermaier, Helmut; Maier, Ursula; and Weiss, Stefan, to SKW Trostberg Aktiengesellschaft. Process for the production of 2-ethoxy-4,6-dihydroxypyrimidine or its alkali salts. 5,463,055, Cl. 544-299.000.

Hioki, Yuichi; Kurita, Kazuhiko; Kawabata, Keiko; and Azuma, Toshikazu, to Kao Corporation. Agricultural chemical composition enhancer comprising quaternary di(polyoxyalkylene) ammonium alkyl sulfates. 5,462,912, Cl. 504-116.000.

Hipeaux, Jean-Claude: *See—*

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Hiramatsu, Naoto: *See—*

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Hirono, Kazuhisa, to Brother Kogyo Kabushiki Kaisha. Tape printer and method. 5,462,372, Cl. 400-615.200.

Hiroshima, Yasunori; and Kondo, Kenji, to Pioneer Electronic Corporation. Printed circuit board working machine. 5,462,512, Cl. 483-57.000.

Hirota, Makoto: *See—*

Inaba, Shigeru; Fukuhara, Masaaki; Hirota, Makoto; Yamamoto, Mitsuo; Abe, Jun; Miyata, Hideaki; Sunaga, Takayuki; Ishikawa, Toru; Shiina, Yoshio; Isosu, Toru; and Kanno, Makoto, 5,463,452, Cl. 355-246.000.

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Hiruta, Yoichi, to Kabushiki Kaisha Toshiba. Semiconductor integrated circuit device having sealing means. 5,463,245, Cl. 257-620.000.

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- Hiser, Douglas L.: *See—*
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- Hitachi Computer Products (America), Inc.: *See—*
  - Kobayashi, Shigeo, 5,463,742, Cl. 395-281.000.
- Hitachi, Ltd.: *See—*
  - Doi, Toshiya; Ozawa, Takeshi; Tanaka, Kazuhide; Yuasa, Toyotaka; Kamo, Tomoichi; and Matsuda, Shinpei, 5,462,922, Cl. 505-785.000.
  - Futami, Motoo; Endo, Tunehiro; Notohara, Yasuo; and Kitayama, Tooru, 5,463,299, Cl. 318-618.000.
  - Ichinose, Toshiaki; Ninomiya, Takanori; Kuni, Asahiro; Nakahata, Kozo; Hamada, Toshimitsu; and Ayabe, Toshihiko, 5,463,667, Cl. 378-58.000.
  - Inoue, Hiroshi; Tsukahara, Satoshi; and Iwai, Kazumi, 5,461,855, Cl. 60-39.060.
  - Kakuta, Hitoshi; Kamo, Yoshihisa; and Takamoto, Yoshifumi, 5,463,765, Cl. 395-182.040.
  - Kaniwa, Kouji; Nishijima, Hideo; Fujita, Kouji; and Nishimura, Keizo, 5,463,505, Cl. 360-73.040.
  - Kimura, Hiroshi; Miyazawa, Shoichi; Horita, Ryutaro; Hase, Kenichi; Hirano, Akihiko; and Uragami, Akira, 5,463,504, Cl. 360-65.000.
  - Kimura, Tomoaki; Nihei, Mitsuo; Horii, Kenji; and Yoshimoto, Kenichi, 5,461,770, Cl. 29-527.700.
  - Kirino, Fumiyoshi; Saito, Atsushi; Toda, Tsuyoshi; Ide, Hiroshi; Tsuchinaga, Hiroyuki; Maeda, Takeshi; and Kugiya, Fumio, 5,463,600, Cl. 369-13.000.
  - Maeda, Akira; Sugimura, Yoshikane; Funabashi, Motohisa; Nakano, Toshihiko; Someya, Ryuko; and Kosaka, Michitaka, 5,463,718, Cl. 395-23.000.
  - Miyamoto, Harukazu; Miyamoto, Makoto; Andoo, Keikichi; Niihara, Toshio; and Ojima, Masahiro, 5,462,811, Cl. 428-694.0EC.
  - Morioka, Hiroshi; Noguchi, Minori; Ohshima, Yoshimasa; Kembo, Yukio; Nishiyama, Hidetoshi; Matsuoka, Kazuhiko; and Shigyo, Yoshiharu, 5,463,459, Cl. 356-237.000.
  - Nakano, Masaaki; Inoue, Tomoaki; Amano, Hideaki; Takatsuka, Akio; Beppu, Osamu; Mori, Kenji; Yoshida, Takashi; and Kohno, Takashi, 5,463,511, Cl. 360-99.080.
  - Nishi, Takashi; Matsuda, Masami; Noshita, Kenji; Kikuchi, Makoto; Izumida, Tatsuo; Tamata, Shin; and Kiuchi, Yoshimasa, 5,463,171, Cl. 588-4.000.
  - Ono, Tetsuo; Mizutani, Tatsumi; and Suzuki, Keizo, 5,462,635, Cl. 216-67.000.
  - Otaka, Tadashi; Mori, Hiroyoshi; and Todokoro, Hideo, 5,463,221, Cl. 250-310.000.
  - Otomo, Shigekazu; Kumasaka, Noriyuki; Shiiki, Kazuo; Yamashita, Takeo; Saito, Noritoshi; and Tarutani, Yoshinobu, 5,463,518, Cl. 505-171.000.
  - Sakurai, Naoki; and Sugawara, Yoshitaka, 5,463,243, Cl. 257-524.000.
  - Shinbo, Yutaka; Kajimoto, Takeshi; Kobayashi, Mitsuteru; and Sato, Katsuyuki, 5,463,249, Cl. 257-690.000.
  - Sotoyanagi, Osamu; Okami, Yoshinori; and Takahashi, Naoya, 5,463,771, Cl. 395-600.000.
  - Terasaki, Masatoshi, 5,461,883, Cl. 62-469.000.
  - Umemura, Masaya; Ogura, Toshihiko; Osaka, Hideki; and Shinozaki, Masatsugu, 5,462,442, Cl. 439-69.000.
- Hitachi Maxell, Ltd.: *See—*
  - Oshima, Toshio; Ohiwa, Tsunemi; Nishida, Masato; Matsumoto, Taiji; Itoh, Akihiko; and Takeuchi, Yoji, 5,463,212, Cl. 235-468.000.
- Hitachi Maxwell, Ltd.: *See—*
  - Miyamoto, Harukazu; Miyamoto, Makoto; Andoo, Keikichi; Niihara, Toshio; and Ojima, Masahiro, 5,462,811, Cl. 428-694.0EC.
- Hitachi Metals, Ltd.: *See—*
  - Morita, Shigetaka; Igarashi, Yoshio; and Suzuki, Masanao, 5,462,612, Cl. 148-439.000.
  - Nagamatsu, Hiromitsu, 5,461,852, Cl. 59-84.000.
- Hiyoshi, Hironobu: *See—*
  - Hayashi, Kenji; Watanabe, Nobuhisa; Nose, Koichi; Tanaka, Hiroshi; Ohtsuka, Issei; Kokushi, Motoji; Hiyoshi, Hironobu; Kobayashi, Hiroko; Yamada, Toshie; and Horie, Toru, 5,462,958, Cl. 514-399.000.
- Hjipieris, George: *See—*
  - Pegg, Timothy J.; Hjipieris, George; and Bullock, Andrew G., 5,463,310, Cl. 324-95.000.
- HMG Worldwide In-Store Marketing, Inc.: *See—*
  - Figh, Jack; and Cuddihy, Robert V., Jr., 5,463,209, Cl. 235-383.000.
- Hnatyszyn, H. James: *See—*
  - Kossovsky, Nir; Hnatyszyn, H. James; and Gelman, Andrew, 5,462,751, Cl. 424-494.000.
- Ho, May F.; and Tappon, Ellen, to Hewlett-Packard Company. Internal support for top-shooter thermal ink-jet printhead. 5,463,413, Cl. 347-65.000.
- Ho, Ping-Pei: *See—*
  - Alfano, Robert R.; Ho, Ping-Pei; and Baldeck, Patrice, 5,463,485, Cl. 359-107.000.
- Hobart Laser Products, Inc.: *See—*
  - Filgas, David M.; McFadden, Gordon M.; Broome, Jeffrey; and York, James F., 5,463,710, Cl. 385-90.000.
- Hobden, Mervyn K., to Plessey Semiconductors Limited. Wide-band microwave modulator arrangements. 5,463,357, Cl. 332-151.000.
- Hobrock, Lowell M., to Hughes Aircraft Company. Extrinsic semiconductor optical filter. 5,463,494, Cl. 359-359.000.
- Hoda, Takeo: *See—*
  - Shintani, Dai; Okada, Hiroyuki; Hoda, Takeo; Izumi, Shuji; Mukai, Hiromu; Hatamori, Osamu; and Tsuji, Sadafusa, 5,463,436, Cl. 354-81.000.
- Hodson, Price R.; Chu, Federico; Buchanan, Arnold; and Montividas, Robert E., to Alnor Instrument Company. Fluid flow direction and velocity monitor. 5,461,910, Cl. 73-170.120.
- Hodson, Trevor M.: *See—*
  - Marsh, Michael J. C.; and Hodson, Trevor M., 5,463,671, Cl. 379-56.000.
- Hoechst Aktiengesellschaft: *See—*
  - Bahrmann, Helmut; Greb, Wolfgana; Heymanns, Peter; Lappe, Peter; Müller, Thomas; Szameitat, Jürgen; and Wiebus, Ernst, 5,462,986, Cl. 524-296.000.
  - Bahrmann, Helmut; Greb, Wolfgang; Heymanns, Peter; Lappe, Peter; Müller, Thomas; Szameitat, Jürgen; and Wiebus, Ernst, 5,463,147, Cl. 568-882.000.
  - Beyer, Gerhard; Sulzbach, Reinhard; Wess, Eduard; and Hengel, Rolf, 5,463,021, Cl. 528-482.000.
  - Hemmerle, Horst; Schindler, Peter; and Herling, Andreas, 5,463,062, Cl. 546-168.000.
  - Jacobi, Detlef; Jendralla, Heiner; and Kammermeier, Bernhard, 5,463,124, Cl. 564-155.000.
  - Kanschik-Conradsen, Andreas; and Papenfuhs, Theodor, 5,463,135, Cl. 568-331.000.
  - Kramer, Werner; and Wess, Günther, 5,462,933, Cl. 514-176.000.
  - Müller, Josef, 5,462,254, Cl. 251-144.000.
  - Miess, Georg-Emerich; Roth, Peter M.; Heinrich, Karl; and Rewitzer, Siegfried, 5,462,643, Cl. 203-72.000.
  - Ort, Oswald; Bauer, Klaus; and Bieringer, Hermann, 5,463,081, Cl. 549-13.000.
  - Papenfuhs, Theodor; Kanschik-Conradsen, Andreas; and Pressler, Wilfried, 5,463,148, Cl. 568-938.000.
  - Rupp, Walter, 5,463,100, Cl. 558-29.000.
- Hoechst Celanase Corporation: *See—*
  - Donovan, John W.; and Lavieri, Frank P., 5,463,033, Cl. 534-642.000.
- Hoechst Celanese Corporation: *See—*
  - Brown, David M.; Gatter, Erich M.; and Littau, Cheryl A., 5,463,094, Cl. 554-110.000.
  - Browne, Colin L.; and Robertson, Raymond M., 5,462,072, Cl. 131-334.000.
  - Serad, George A.; and Thornburg, Theodore S., 5,462,973, Cl. 521-62.000.
  - Sounik, James R.; Wilkison, William W., III; Russ, Keith M.; and Massarelli, Lynn, 5,463,108, Cl. 560-130.000.
  - Vicaari, Richard, 5,462,840, Cl. 430-326.000.
- Hoechst Clanese Corporation: *See—*
  - Sounik, James R.; Wilkison, William W., III; and Russ, Keith M., 5,463,141, Cl. 568-763.000.
- Hoefle, Milton L.: *See—*
  - Boschelli, Diane H.; Connor, David T.; and Hoefle, Milton L., 5,462,952, Cl. 514-364.000.
- Hoff, Don G.; and Ragan, Lawrence H., to Seiko Corp.; and Seiko Epson Corp. Wireless facsimile computer slate. 5,463,626, Cl. 370-94.100.
- Hoff, Richard W.; and Martin, David R., to United Technologies Corporation. Coolable airfoil structure. 5,462,405, Cl. 416-97.00R.
- Hoffbeck, Loren J., to Pioneer Hi-Bred International, Inc. Inbred corn line PHR61. 5,463,173, Cl. 800-200.000.
- Hoffman, Kenneth C.: *See—*
  - Raines, Charles D.; and Hoffman, Kenneth C., 5,462,756, Cl. 426-129.000.
- Hoffmann, Hans-Rainer: *See—*
  - Wolter, Karin; Müller, Walter; Simon, Günter; Nalbach, Christa; and Hoffmann, Hans-Rainer, 5,462,746, Cl. 424-449.000.
- Hoffmann-La Roche Inc.: *See—*
  - Koch, Bruno; and Schacher, Gottlieb, 5,462,715, Cl. 422-64.000.
  - Stocker, Achim; and Woggon, Wolf D., 5,462,865, Cl. 435-125.000.
- Hofmann, Gunter A., to Genetronics, Inc. Transsurface drug delivery by electrofusion of microbubbles to the tissue surface. 5,462,520, Cl. 604-20.000.
- Hogg, Raymond L.; and Diaz, Felix V., to DSC Communications Corporation. Bus arbitration method for telecommunications switching. 5,463,624, Cl. 370-85.600.
- Hogrefe, Arnold W.: *See—*
  - Carson, Robert T.; Hogrefe, Arnold W.; and Juskey, Frank J., Jr., 5,463,190, Cl. 174-259.000.
- Hohimer, John P.: *See—*
  - Ashby, Carol I. H.; Hohimer, John P.; Neal, Daniel R.; and Vawter, G. Allen, 5,463,649, Cl. 372-40.000.
- Hokuren Federation of Agricultural Cooperatives, The: *See—*
  - Hidano, Tetsuhiro; Takeda, Hiroyuki; Tsukada, Masayuki; Yamamoto, Kazuo; and Inoue, Atsushi, 5,463,038, Cl. 536-124.000.
- Hokuriku Seikei Industrial Co., Ltd.: *See—*
  - Okesaku, Masahiro, 5,462,095, Cl. 139-435.400.
- Holck, Timothy M.: *See—*
  - DeWitt, Jimmie E.; Holck, Timothy M.; Summers, James H.; and Emrick, Samuel L., 5,463,775, Cl. 395-184.010.
- Holden, Homer N.: *See—*
  - Winter, Jeffrey J.; Holden, Homer N.; and Lawrence, James L., 5,462,090, Cl. 138-121.000.
- Holland, George F.: *See—*

Chiang, Marilyn C.; Fenley, R. Earl, Jr.; Holland, George F.; Javvaji, Anand K.; and Sreedhara, Ramadevi, 5,463,670, Cl. 379-27.000.

Holland, Herbert W. Liquid hydrocarbon sorbing and solidifying pillow. 5,462,785, Cl. 428-76.000.

Holland, Malcolm J.; and Rainey, Michael J., to SafeSea Systems, Inc. Man overboard alert and locating system. 5,463,598, Cl. 367-131.000.

Holle, Armin, to Bruker-Franzen Analytik GmbH. Detection of very large molecular ions in a time-of-flight mass spectrometer. 5,463,218, Cl. 250-281.000.

Holm, Christopher E.: *See*—
Verdegan, Barry M.; Holm, Christopher E.; Fallon, Stephen L.; and Schwandt, Brian W., 5,462,679, Cl. 210-798.000.

Holm, Kaj, to K.H. Innovations Oy. Separation and concentration method based on selective absorption. 5,462,582, Cl. 95-175.000.

Holm, Niels E. Container for receiving and separating a fluid, preferably blood plasma, into its ingredients. 5,462,716, Cl. 422-102.000.

Holmes, Francis J.: *See*—
Webber, James L.; and Holmes, Francis J., 5,462,307, Cl. 280-737.000.

Holmes, Jeffrey G.; and McNeil, Andrew C., to Motorola, Inc. Apparatus and method of elastically bowing a base plate. 5,461,774, Cl. 29-840.000.

Holmes, John E.: *See*—
Petitpierre, Eric M.; and Holmes, John E., 5,463,532, Cl. 361-800.000.

Holmes, John J.; and Lackey, Milton H., to United States of America, Navy. Zero field degaussing system and method. 5,463,523, Cl. 361-149.000.

Holmgren, Jennifer S.: *See*—
Galperin, Leonid B.; Bricker, Jeffery C.; and Holmgren, Jennifer S., 5,463,155, Cl. 585-310.000.

Holody, Mark Z.: *See*—
Gehrich, John L.; Maxwell, Thomas P.; Hacker, Thomas G.; and Holody, Mark Z., 5,462,052, Cl. 128-632.000.

Holste, James C.: *See*—
Hall, Kenneth R.; Morrison, Gerald L.; and Holste, James C., 5,461,932, Cl. 73-861.610.

Holzwarth, Henry A.: *See*—
Kaplan, Donald S.; Hermes, Matthew E.; Muth, Ross R.; Brown, David L.; and Holzwarth, Henry A., 5,462,162, Cl. 206-339.000.

Honda Giken Kogyo Kabushiki Kaisha: *See*—
Hasegawa, Yusuke; and Maki, Hidetaka, 5,462,037, Cl. 123-673.000.
Kamiyama, Shiro; Kosugi, Masanori; Kurata, Masahiro; Shiraishi, Sadao; and Sasaki, Nobuyoshi, 5,462,634, Cl. 216-85.000.
Katoh, Hisashi; Nakajima, Tadayoshi; Hata, Tsunehisa; Miyano, Hideyo; and Koda, Shinsuke, 5,462,108, Cl. 164-98.000.
Seki, Kazuhiro; Aoki, Takashi; Hirahara, Shinichi; and Motozawa, Yasuki, 5,462,308, Cl. 280-749.000.

Honda, Takafaru. Code mark reader. 5,463,213, Cl. 235-468.000.

Honda, Toshiyuki: *See*—
Waki, Masaki; Kasai, Junichi; Aoki, Tsuyoshi; Honda, Toshiyuki; and Sato, Hirotaka, 5,463,253, Cl. 257-724.000.

Hondumi, Masahiko: *See*—
Yashiki, Yuichi; Hondumi, Masahiko; Ohki, Yuzuru; Ito, Takashi; Nakjajima, Fumitaka; Mori, Masakazu; Aoki, Takayoshi; Mizuishi, Harumitsu; and Shibuya, Yuusaku, 5,463,456, Cl. 355-299.000.

Hong, Kyung S.: *See*—
Kim, Jung C.; Oh, Dong Y.; Choe, Gyu S.; Hong, Kyung S.; Kim, Kyung H.; Lee, Joo H.; Lee, Ha I.; Park, Kyeong B.; Gil, Dong S.; Kwon, Oh H.; and Kwon, Byoung H., 5,461,886, Cl. 68-3.0SS.

Hong-Rong, Shiau; and Chen, Ching S. Animal leash. 5,462,019, Cl. 119-795.000.

Honma, Masato: *See*—
Kimura, Mitsuteru; and Honma, Masato, 5,463,277, Cl. 315-169.100.

Hood, G. David: *See*—
Bailey, James R.; Hood, G. David; and Wasley, Alan A., 5,462,551, Cl. 606-88.000.

Hopkins, Scott D.; and Pierce, Timothy P., to Pall Corporation. Filter assembly and method of reducing hold-up in a filter assembly. 5,462,675, Cl. 210-767.000.

Hori, Haruhiko, to Minolta Co., Ltd. Feeding device. 5,462,267, Cl. 271-10.040.

Hori, Kazuyoshi: *See*—
Kawashima, Makoto; Nagano, Kazuhiro; Hori, Kazuyoshi; Ishikawa, Hiroaki; and Morishita, Masataka, 5,462,929, Cl. 514-43.000.

Hori, Toshihiko: *See*—
Matsuishi, Tsugumi; Hori, Toshihiko; and Suda, Shinji, 5,463,738, Cl. 395-823.000.

Horibe, Toshihiko: *See*—
Konishi, Toshio; Horibe, Toshihiko; Yashiro, Toru; Watanabe, Kouji; and Shuin, Toshiya, 5,462,806, Cl. 428-451.000.

Horie, Toru: *See*—
Hayashi, Kenji; Watanabe, Nobuhisa; Nose, Koichi; Tanaka, Hiroshi; Ohtsuka, Issei; Kokushi, Motoji; Hiyoshi, Hironobu; Kobayashi, Hiroko; Yamada, Toshie; and Horie, Toru, 5,462,958, Cl. 514-399.000.

Horigome, Jiro: *See*—
Terao, Kazuhiko; Iida, Hidetoku; Nakayama, Takeyasu; Kubo, Toshiya; Horigome, Jiro; Matsuoka, Yoshihiro; Takeda, Nobutoshi; and Mizuhashi, Tohru, 5,463,709, Cl. 385-85.000.

Horii, Kenji: *See*—
Kimura, Tomoaki; Nihei, Mitsuo; Horii, Kenji; and Yoshimoto, Kenichi, 5,461,770, Cl. 29-527.700.

Horiike, Mitsuaki: *See*—
Kubota, Hideyuki; Horiike, Mitsuaki; and Furukawa, Toshiharu, 5,462,830, Cl. 430-110.000.

Horikawa, Yasuo; Takizawa, Toshiki; and Akazawa, Taro, to Bridgestone Corporation. Process for polymerizing conjugated dienes with lithium-tin-nitrogen initiators. 5,463,003, Cl. 526-176.000.

Horikawa, Yasuo, to Bridgestone Corporation. Process for polymerizing conjugated dienes with lithium-tin-nitrogen initiators. 5,463,004, Cl. 526-176.000.

Horita, Ryutaro: *See*—
Kimura, Hiroshi; Miyazawa, Shoichi; Horita, Ryutaro; Hase, Kenichi; Hirano, Akihiko; and Uragami, Akira, 5,463,504, Cl. 360-65.000.

Horiuchi, Yoshimi, to Fuji Electric Co., Ltd. Fuel cell power generation system and method of controlling the same. 5,462,815, Cl. 429-13.000.

Horiuchi, Yukio; and Ryu, Shiro, to Kokusai Denshin Denwa Company, Ltd. Coherent optical receiver having optically amplified local oscillator signal. 5,463,461, Cl. 356-349.000.

Horn, Donald L.: *See*—
Kuss, Thomas; and Horn, Donald L., 5,462,425, Cl. 425-183.000.

Horne, Graham R.: *See*—
Sankey, John P.; Sanderson, William; and Horne, Graham R., 5,463,112, Cl. 562-2.000.

Hornschuh, Manfred. Method of manufacturing a flexographic printing plate. 5,462,836, Cl. 430-306.000.

Horstkötter, Ralf: *See*—
Güstävel, Andreas; Horstkötter, Ralf; Schlenz, Rolf; and Strunk, Harald, 5,462,422, Cl. 425-129.100.

Horvath, Istvan T.; and Rabai, Jozsef, to Exxon Research and Engineering Company. Fluorous multiphase systems. 5,463,082, Cl. 549-46.000.

Horwich, Lisa J.: *See*—
Minton, Gerald T.; Horwich, Lisa J.; and Gilbert, Steven R., 5,462,166, Cl. 206-440.000.

Hosaka, Tohru; Mizuno, Hideharu; Koushima, Yuji; Kohara, Teiji; and Natsuume, Tadao, to Nippon Zeon Co., Ltd. Hydrogenated products of thermoplastic norbornene polymers, their production, substrates for optical elements obtained by molding them, optical elements and lenses. 5,462,995, Cl. 525-332.100.

Hoshino, Kousaku: *See*—
Maeda, Takashi; Furukido, Takeshi; Hoshino, Kousaku; Udo, Satoru; and Izumi, Masayoshi, 5,462,291, Cl. 277-100.000.

Hoshino, Masayuki: *See*—
Kashima, Toshihiro; Hoshino, Masayuki; Nakano, Masachika; and Hirano, Tokushiro, 5,462,791, Cl. 428-259.000.

Hoshino, Yasuharu, to NEC Corporation. Semiconductor memory device. 5,463,584, Cl. 365-189.050.

Hoshino, Yoshimasa, to NEC Corporation. Magnetic head assembly for a magnetic disk drive. 5,463,513, Cl. 360-104.000.

Hospers, Paul A.: *See*—
Henckel, Jonathan D.; and Hospers, Paul A., 5,463,725, Cl. 395-155.000.

Hostetler, Karl Y.; and Kumar, Raj, to Vestar, Inc. Lipid derivatives of phosphonacids for liposomal incorporation and method of use. 5,463,092, Cl. 554-40.000.

Hotate, Shiroh: *See*—
Yamazaki, Hiraku; Sugai, Teruo; Kato, Shigeo; Tazoe, Haruo; Hotate, Shiroh; and Goto, Iwao, 5,462,800, Cl. 428-408.000.

Hotkowski, Peter, to VeloBind, Incorporated. Hopper and feed for plastic book-binding strips. 5,462,196, Cl. 221-1.000.

Hotton, Donald J.; and Broad, Sherry A., to General Motors Corporation. Seat skinning apparatus. 5,461,764, Cl. 29-91.000.

Hou, Ben: *See*—
Wang, Oliver; and Hou, Ben, 5,463,256, Cl. 271-274.000.

Hou, Donald; Draper, Richard W.; Lee, Gary M.; Mas, Janet L.; and Mergelsberg, Ingrid, to Schering Corporation. Process for preparing benzazepine intermediates for the synthesis of D1. 5,463,051, Cl. 540-576.000.

Houei Co., Ltd.: *See*—
Koiduka, Tomonari, 5,461,748, Cl. 15-161.000.

Howa Machinery, Ltd.: *See*—
Yasuda, Hironori; and Yamamoto, Katsumoto, 5,461,758, Cl. 19-239.000.

Howden, Dwight E., Jr. Rug winding apparatus. 5,462,241, Cl. 242-533.700.

Howell, David C.: *See*—
Funderburk, C. Michael; Jordan, P. Kurt; Newman, John A.; McEwen, J. C.; and Howell, David C., 5,461,998, Cl. 112-306.000.

Howell, David G., to Whitaker Corporation, The. Contact retention device for an electrical connector. 5,462,456, Cl. 439-733.100.

Howmet Corporation: *See*—
Punola, David C.; Basta, William C.; and Smith, Jeffery S., 5,462,013, Cl. 118-719.000.

Hsieh, Dick M. Fastener for a suitcase. 5,461,892, Cl. 70-73.000.

Hsieh, Jih-Han; Shih, Shu-Ching; Chi, Wei-Kuang; Chu, Yi-Ding; and Lin, Ae-Ning, to Development Center for Biotechnology. Isolation of Hepatitis B surface antigen from transformed yeast cells. 5,462,863, Cl. 435-69.300.

Hsu, Chang S.: *See*—
Brois, Stanley J.; Patil, Abhimanyu O.; Schulz, Wolfgang W.; Hsu, Chang S.; and Garner, Richard T., 5,462,680, Cl. 252-9.000.

Hsu, Michael S. Radiant thermal integration with regenerative heating in a high temperature electrochemical converter. 5,462,817, Cl. 429-19.000.

Hu, Aaron S.: *See*—
Snyder, Timothy S.; Rosfjord, Thomas J.; McVey, John B.; Hu, Aaron S.; and Schlein, Barry C., 5,461,865, Cl. 60-737.000.

Hu, Andrew T.: *See*—

Chen, Jui-Hsiang; Wei, Jeng; Hu, Andrew T.; Lee, Yu-Der; Laiw, Ru-Fong; Chen, Muh-Lan; Chang, Chung-Yi; Lee, Fan-Yen; and Jiang, Shu-Fang, 5,462,704, Cl. 264-41.000.

Hu, Chen-Ze; Dolence, Eric K.; Osaki, Shigemasa; and Sanders, Clifton G., to Surface Engineering Technologies, Division of Innerdyne, Inc. Hydrocyclosiloxane membrane prepared by plasma polymerization process. 5,463,010, Cl. 528-25.000.

Huang, Chen-Shi: *See—*

Resasco, Daniel E.; Marcus, Bonita K.; Huang, Chen-Shi; and Durante, Vincent A., 5,462,904, Cl. 502-222.000.

Huang, Jui L. Movable type measurement scale at variable angles. 5,461,794, Cl. 33-470.000.

Hubbell Incorporated: *See—*

Petitpierre, Eric M.; and Holmes, John E., 5,463,532, Cl. 361-800.000.

Hubbell, Jeffrey A.; Elbert, Donald; Hill-West, Jennifer L.; Drumheller, Paul D.; Chowdhury, Sanghamitra; and Sawhney, Amarpreet, to Board of Regents, The University of Texas System. Multifunctional organic polymers. 5,462,990, Cl. 525-54.100.

Huellmann, Michael: *See—*

Becker, Rainer; Huellmann, Michael; Palm, Christof; and Franzischka, Wolfgang, 5,463,020, Cl. 528-408.000.

Huels Aktiengesellschaft: *See—*

Sridhar, Srinivasan, 5,463,121, Cl. 562-600.000.

Hughes Aircraft Company: *See—*

Frankot, Robert T., 5,463,397, Cl. 342-25.000.

Hall, John T.; and Tanzer, Herbert J., 5,463,303, Cl. 320-2.000.

Hobrock, Lowell M., 5,463,494, Cl. 359-359.000.

Oldham, Susan L.; and Rosengard, Jordan L., 5,462,627, Cl. 156-275.700.

Hull, Harold L.; and Choat, Michael J. Occupant actuated water vehicle. 5,462,466, Cl. 441-76.000.

Hüls Aktiengesellschaft: *See—*

Steffen, Klaus-Dieter, 5,463,111, Cl. 560-192.000.

Hunt, Thomas J.; Herrick, Benjamin M.; Robertson, Kimberly K.; Thiele, Karl E.; and Ziel, J. Mark, to Hewlett-Packard Company. Ultrasound imaging system using line splicing and parallel receive beam formation. 5,462,057, Cl. 128-661.010.

Hunter Douglas International N.V.: *See—*

De Jong, Hendrikus, 5,462,792, Cl. 428-297.000.

Hunter Fan Company: *See—*

Scofield, Robert L.; and Pearce, Richard A., 5,462,412, Cl. 416-210.00R.

Hupcey, John A.: *See—*

Beausoleil, William F.; Berghorn, Charles R.; Hupcey, John A.; and Schlosser, Sandra J., 5,463,754, Cl. 395-200.080.

Hurlbut, Amy O.: *See—*

Sutterlin, Philip H.; Downey, Walter J.; Chui, Benjamin W.; Stewart, J. Marcus; and Hurlbut, Amy O., 5,463,662, Cl. 375-351.000.

Hursey, Robert: *See—*

Lipton, Lenny; Halnon, Jeffrey J.; Mitchell, Larry H.; and Hursey, Robert, 5,463,428, Cl. 351-158.000.

Husqvarna Aktiebolag: *See—*

Landén, Jan-Olof, 5,461,997, Cl. 112-237.000.

Hussein, Hany M. G.: *See—*

Saksena, Sanjeev; Sulek, Stanislaw; and Hussein, Hany M. G., 5,462,544, Cl. 606-15.000.

Hussey, Robert M.: *See—*

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Hussion, Sajjet: *See—*

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Hutchinson: *See—*

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Hutchinson, Richard A.: *See—*

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Hutchison, Alan: *See—*

Thurkauf, Andrew; and Hutchison, Alan, 5,463,054, Cl. 544-250.000.

Huvey, Michel; Grosjean, Francois; and Montabord, Lucien, to Institut Francais du Petrole. Laser engraving to form printing surfaces. 5,462,774, Cl. 427-555.000.

Hwang, Sung B.; and Lee, Keun Y., to Hyundai Electronics Industries, Co., Ltd. Method for making a tungsten plug of a semiconductor device. 5,462,890, Cl. 437-187.000.

Hydro-Quebec: *See—*

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HydroChem Industrial Services, Inc.: *See—*

Arrington, Stephen T.; and Bradley, Gary W., 5,462,671, Cl. 210-717.000.

Hymer, Robert F. Motorcycle carrier. 5,462,398, Cl. 414-462.000.

Hyundai Electronics America: *See—*

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Hyundai Electronics Industries, Co., Ltd.: *See—*

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Hyzer, Susan M.: *See—*

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Ibaraki, Satoru: *See—*

Furukawa, Hiroki; Tagawa, Junichi; Kanamori, Takeo; and Ibaraki, Satoru, 5,463,618, Cl. 370-32.100.

Ichige, Akihiro: *See—*

Hayashida, Haruo; Ichige, Akihiro; Ogawa, Tadatoshi; Yamada, Takeshi; Tada, Teruo; Zenigame, Masaaki; Wano, Toyoki; and Kondo, Kazuo, 5,462,777, Cl. 428-2.000.

Ichikawa, Yataro: *See—*

Sumi, Yoshihiko; Ichikawa, Yataro; Aoki, Nobuo; and Muramatsu, Masami, 5,463,025, Cl. 530-380.000.

Ichimura, Shozo; Tabei, Seikichi; and Hashimoto, Michinori, to Nippon Chemical Industrial Co., Ltd. Air purifying agent and a process for producing same. 5,462,693, Cl. 252-190.000.

Ichimura, Teruhiko: *See—*

Nasu, Yasuhiro; Ichimura, Teruhiko; and Matsumoto, Tomotaka, 5,462,885, Cl. 437-40.000.

Ichinose, Toshiaki; Ninomiya, Takanori; Kuni, Asahiro; Nakahata, Kozo; Hamada, Toshimitsu; and Ayabe, Toshihiko, to Hitachi, Ltd. Inspection method for soldered joints using x-ray imaging and apparatus therefor. 5,463,667, Cl. 378-58.000.

ICI Pharma: *See—*

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Ide, Hiroshi: *See—*

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Ideal Ideas, Inc.: *See—*

Glynn, Kenneth P., 5,462,181, Cl. 215-204.000.

Igarashi, Yoshio: *See—*

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Iguchi, Masao: *See—*

Shimizu, Izuru; Yoshida, Tetsuo; Iguchi, Masao; and Fukanuma, Tetsuhiko, 5,462,418, Cl. 418-55.300.

Iida, Hidetoku: *See—*

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Iida, Takehiro: *See—*

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Iijima, Masakazu: *See—*

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Nukada, Katsumi; Imai, Akira; and Iijima, Masakazu, 5,463,044, Cl. 540-143.000.

Iijima, Ryunosuke: *See—*

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Iino, Yukio; Ishii, Makoto; Ohsumi, Koji; and Tsuji, Takashi, to Ajinomoto Co., Inc. Anisomycin derivatives and anticancer agents, antifungal agents and antiprotozoan agents containing the same. 5,463,078, Cl. 548-541.000.

Iiyama, Michitomo: *See—*

Nakamura, Takao; Inada, Hiroshi; and Iiyama, Michitomo, 5,462,918, Cl. 505-193.000.

Tanaka, So; and Iiyama, Michitomo, 5,462,919, Cl. 505-410.000.

Iizuka, Miyuki: *See—*

Yamada, Isamu; Shiba, Akira; and Iizuka, Miyuki, 5,462,058, Cl. 128-661.080.

Iizuka, Tomoko: *See—*

Shimada, Tadahiro; Yuki, Sachiko; and Iizuka, Tomoko, 5,462,691, Cl. 252-174.150.

Iji, Masahiro; Yoda, Masami; Suzuki, Shin; Ishizuka, Kaoru; Kubo, Sotoo; Yamaki, Isao; and Hashimoto, Toshikuni, to Chemical Grouting Co., Ltd.; Front Engineering Co. Ltd.; Kurita Water Industries Ltd.; and Shoesangyo Corporation. Process for treating sludge and system for the same. 5,462,672, Cl. 210-727.000.

Ikeda Bussan Co., Ltd.: *See—*

Hamada, Shinji, 5,462,305, Cl. 280-728.200.

Ikeda, Eiichiro: *See—*

Miyata, Hirofumi; Akahoshi, Yoshihiro; Ikeda, Eiichiro; and Furukawa, Yutaka, 5,462,492, Cl. 474-38.000.

Ikeda, Itsuo: *See—*

Kurotori, Tsuneo; Mochizuki, Manabu; Ariyama, Kenzo; Kojima, Kenji; Tsuruoka, Ichiro; Echigo, Katsuhiro; Miyao, Mayumi; and Ikeda, Itsuo, 5,463,453, Cl. 355-256.000.

Ikeda, Kiyoshi: *See—*

Yamamoto, Keisaku; Ikeda, Kiyoshi; and Fukuyama, Masahiro, 5,462,975, Cl. 521-90.000.

Ikeda, Naoki: *See—*

Matsuoka, Fumitomo; and Ikeda, Naoki, 5,462,893, Cl. 437-195.000.

Ikeda, Nobuaki: *See—*

Sugiyama, Shunichi; Kametani, Hiroshi; Yoshikoshi, Hideyuki; Ikeda, Nobuaki; and Hara, Tomihiro, 5,462,686, Cl. 252-62.620.

Ikeda, Shigeru; and Oguma, Yoshio, to France Bed Co., Ltd. Mattress apparatus and method for manufacturing the same. 5,461,737, Cl. 5-475.000.

Ikeda, Tadashi: *See—*

Kato, Takashi; and Ikeda, Tadashi, 5,462,851, Cl. 430-584.000.

Ikeda, Tsukasa; and Tamano, Akihiko, to Sankei Giken Kogyo Kabushiki Kaisha. Apparatus for manufacturing a silencer. 5,461,777, Cl. 29-890.080.

Ikeda, Yasuo, to NEC Corporation. Chemical vapor deposition method for forming SiO_2. 5,462,899, Cl. 437-238.000.

Ikeda, Yuichi: *See—*

Sakurai, Tomohisa; Nagaoka, Yukiko; Kubota, Tetsumaru; and Ikeda, Yuichi, 5,462,522, Cl. 604-22.000.

Ikeda, Yuko: *See—*

Niimura, Koichi; Ikeda, Yuko; Kato, Akira; and Ando, Takao, 5,462,957, Cl. 514-397.000.

Ikemoto, Isao: *See—*

Watanabe, Kazushi; Sasaki, Shinichi; Ikemoto, Isao; Miyabe, Shigeo; and Noda, Shinya, 5,463,446, Cl. 355-200.000.

Ikesue, Haruyuki: *See—*

Matsuki, Masuo; and Ikesue, Haruyuki, 5,461,983, Cl. 102-530.000.

Ikeya, Kiyokazu, to Texas Instruments Incorporated. Socket apparatus. 5,462,446, Cl. 439-264.000.

Ikumoto, Junichi; and Yasuda, Akio, to Minoru Industrial Company, Limited. Tractor-drawn direct seed sowing apparatus. 5,461,993, Cl. 111-52.000.

Iler, Gary T.: *See—*

Rea, Perry J.; Miller, Michael R.; Iler, Gary T.; and Stevens, William E., 5,462,313, Cl. 285-21.000.

Illinois Tool Works Inc.: *See—*

Small, Edith M.; Prisby, Michael V.; and Thomason, Terry D., 5,462,622, Cl. 156-245.000.

Im, Jong P. Ink pad with refillable ink reservoir. 5,462,595, Cl. 118-264.000.

Imada, Michihiro: *See—*

Mamiya, Kiyotaka; Imada, Michihiro; and Morimasa, Takanobu, 5,462,039, Cl. 123-686.000.

Imahase, Tomotoshi: *See—*

Meki, Naoto; Imahase, Tomotoshi; Nishida, Kazue; Fujimoto, Hiroaki; Mikitani, Kenichi; Takano, Hirotaka; Ogasawara, Yoriko; and Tamaki, Masahiro, 5,462,961, Cl. 514-407.000.

Imai, Akira: *See—*

Nukada, Katsumi; Imai, Akira; Daimon, Katsumi; Iijima, Masakazu; Mashimo, Kiyokazu; Sakaguchi, Yasuo; and Takegawa, Ichiro, 5,463,043, Cl. 540-141.000.

Nukada, Katsumi; Imai, Akira; and Iijima, Masakazu, 5,463,044, Cl. 540-143.000.

Imai, Keisuke; and Tsukiyama, Naohiro, to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho. Preloader for a webbing retractor. 5,462,340, Cl. 297-478.000.

Imai, Masahito: *See—*

Fujii, Tetsuo; and Imai, Masahito, 5,461,916, Cl. 73-514.320.

Imai, Shunzo: *See—*

Muraki, Masato; Suzuki, Akiyoshi; and Imai, Shunzo, 5,463,497, Cl. 359-618.000.

Imamura, Yukio, to Japan Steel Works, Ltd., The. Extruder. 5,462,426, Cl. 425-190.000.

Imazono, Masahiko: *See—*

Enoki, Masatoshi; Tokunaga, Osamu; Yamato, Shinichi; and Imazono, Masahiko, 5,462,224, Cl. 236-12.130.

Immunex Corporation: *See—*

Dunn, Joseph T.; and Waugh, Stephen M., 5,463,029, Cl. 530-416.000.

IMP, Inc.: *See—*

Petersen, Corey D.; Hiser, Douglas L.; and Kardontchik, Jaime E., 5,463,349, Cl. 330-254.000.

Petersen, Corey D., 5,463,603, Cl. 369-48.000.

Imperial Chemical Industries PLC: *See—*

Bruneau, Pierre A. R.; Crawley, Graham C.; and Oldham, Keith, 5,462,953, Cl. 514-379.000.

Butcher, Jane L.; Ryan, Thomas A.; and Burgess, Leslie, 5,463,139, Cl. 568-683.000.

McTaggart, Fergus; Pemberton, Denis; and Smith, Graham J., 5,462,730, Cl. 424-78.350.

Imperial College of Science, Technology & Medicine: *See—*

Albery, John W.; and Galley, Peter T., 5,462,645, Cl. 204-153.120.

Implant Innovations, Inc.: *See—*

Beaty, Keith D., 5,462,436, Cl. 433-141.000.

Imra Europe SA: *See—*

Gschwind, Michel; and Ancey, Pascal, 5,462,608, Cl. 136-203.000.

Imura, Satoshi: *See—*

Kobayakawa, Takashi; Imura, Satoshi; Itonaga, Kazumasa; and Kuramoto, Kazuhiko, 5,462,698, Cl. 252-586.000.

Imura, Shigeru, to Sony Corporation. IC card reader. 5,463,210, Cl. 235-441.000.

Imura, Yoshio: *See—*

Tanaka, Etsuo; Kai, Tadao; Okano, Hiroshi; Katayama, Akira; and Imura, Yoshio, 5,463,443, Cl. 354-430.000.

Ina Walzlager Schaeffler KG: *See—*

Häusler, Oskar, 5,462,366, Cl. 384-457.000.

Inaba, Kazuki: *See—*

Takito, Tetsuo; Inaba, Kazuki; Kinoshita, Yasuo; and Sasaki, Teruhiko, 5,462,650, Cl. 208-58.000.

Inaba, Shigeru; Fukuhara, Masaaki; Hirota, Makoto; Yamamoto, Mitsuo; Abe, Jun; Miyata, Hideaki; Sunaga, Takayuki; Ishikawa, Toru; Shiina, Yoshio; Isosu, Toru; and Kanno, Makoto, to Fuji Xerox Co., Ltd. Single-component developing apparatus. 5,463,452, Cl. 355-246.000.

Inada, Hiroshi: *See—*

Nakamura, Takao; Inada, Hiroshi; and Iiyama, Michitomo, 5,462,918, Cl. 505-193.000.

Inagaki, Masanao: *See—*

Haga, Nobuhiro; Inagaki, Masanao; Matsumoto, Saichi; and Kamata, Susumu, 5,463,052, Cl. 544-2.000.

Inagaki, Shinji: *See—*

Nagami, Tetsuo; Ogura, Yoshitsugu; Ogai, Masahiko; Fukushima, Yoshiaki; Inagaki, Shinji; Fukumoto, Kazuhiro; Banno, Kouji; Sakakibara, Yuji; Takada, Yasuo; Ohta, Takashi; Okada, Akane; Yamada, Yukimura; Hayashi, Kiyotaka; Matsuura, Shinji; and Kuroda, Kaz, 5,462,905, Cl. 502-232.000.

Inagaki, Tatsuhiko; Kohso, Hiroshi; and Kuwamoto, Makoto, to Matsushita Electric Industrial Co., Ltd. Information recording and reproducing device and a method using the same. 5,463,609, Cl. 369-112.000.

Inagi, Masataka: *See—*

Kawada, Sunao; Inagi, Masataka; Iwamura, Yoshio; Itoh, Toyotsugu; and Hashimoto, Takayoshi, 5,463,503, Cl. 359-838.000.

Inde, Masaaki, to Canon Kabushiki Kaisha. Facsimile apparatus with control of resolution to be compatible with receiving side. 5,463,295, Cl. 358-442.000.

Industrial Technology Research Institute: *See—*

Chen, Jui-Hsiang; Wei, Jeng; Hu, Andrew T.; Lee, Yu-Der; Laiw, Ru-Fong; Chen, Muh-Lan; Chang, Chung-Yi; Lee, Fan-Yen; and Jiang, Shu-Fang, 5,462,704, Cl. 264-41.000.

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Ingram, Keith W.; and Crowley, Daniel J., Jr., to Owens-Illinois Closure Inc. Tamper indicating package. 5,462,184, Cl. 215-252.000.

Ingram, Paul M., Jr.; Johnson, James R.; and Givens, Fenton L., to E-Systems, Inc. Process for multispectral/multilook atmospheric estimation. 5,462,357, Cl. 374-124.000.

Ingram, Paul R.: *See—*

Young, Trent P.; Young, Trent P., Jr.; Ingram, Paul R.; and Ingram, Steven J., 5,463,163, Cl. 588-249.000.

Ingram, Steven J.: *See—*

Young, Trent P.; Young, Trent P., Jr.; Ingram, Paul R.; and Ingram, Steven J., 5,463,163, Cl. 588-249.000.

Inman, Larry R.: *See—*

Garvin, Ronald V.; Inman, Larry R.; and Schuette, Arthur P., 5,461,843, Cl. 53-434.000.

Innoshimaseiki Co., Ltd.: *See—*

Murakami, Tomoyuki, 5,462,630, Cl. 156-421.200.

Innovation Technologies: *See—*

Gagnon, Richard T., 5,463,715, Cl. 395-2.760.

Innovative Medical Products Inc.: *See—*

Bailey, James R.; Hood, G. David; and Wasley, Alan A., 5,462,551, Cl. 606-88.000.

Inoue, Atsushi: *See—*

Hidano, Tetsuhiro; Takeda, Hiroyuki; Tsukada, Masayuki; Yamamoto, Kazuo; and Inoue, Atsushi, 5,463,038, Cl. 536-124.000.

Inoue, Hiroshi; Tsukahara, Satoshi; and Iwai, Kazumi, to Hitachi, Ltd. Method and device for controlling combustors for gasturbine. 5,461,855, Cl. 60-39.060.

Inoue, Ikuko: *See—*

Yamashita, Hirofumi; Inoue, Ikuko; Sasaki, Michio; and Miyagawa, Ryohei, 5,463,232, Cl. 257-223.000.

Inoue, Kazuhiro; Ito, Teruomi; Okuno, Satoshi; and Aono, Katsutoshi, to Drug Delivery System Institute, Ltd. N-acetylcarboxymethylchitosan derivatives and process for preparation thereof. 5,463,022, Cl. 530-322.000.

Inoue, Kenji: *See—*

Watanabe, Naoki; Okutsu, Hirokazu; Isozaki, Masakazu; and Inoue, Kenji, 5,463,444, Cl. 355-27.000.

Inoue, Takahiro; Goto, Masahiro; Sasame, Hiroshi; Tsukida, Shinichi; and Takano, Manabu, to Canon Kabushiki Kaisha. Charging device for applying an oscillating voltage to a member to be charged. 5,463,450, Cl. 355-219.000.

Inoue, Tomoaki: *See—*

Nakano, Masaaki; Inoue, Tomoaki; Amano, Hideaki; Takatsuka, Akio; Beppu, Osamu; Mori, Kenji; Yoshida, Takashi; and Kohno, Takashi, 5,463,511, Cl. 360-99.080.

Insta-Heat, Inc.: *See—*

Scudder, James A.; and Berntsen, James L., 5,461,867, Cl. 62-4.000.

Institut Francais du Petrole: *See—*

Born, Maurice; Aberkane, Ourida; Mieloszynski, Jean-Luc; Paquer, Daniel; and Parc, Guy, 5,463,132, Cl. 568-22.000.

Delfort, Bruno; Daqudal, Bertrand; Lallement, Jacques; Born, Maurice; Marchand, Pierre; and Hipeaux, Jean-Claude, 5,462,682, Cl. 252-18.000.

Huvey, Michel; Grosjean, Francois; and Montabord, Lucien, 5,462,774, Cl. 427-555.000.

Institute of Gas Technology: *See—*

Khinkis, Mark J., 5,462,430, Cl. 431-10.000.

Intel Corporation: *See—*

Fandrich, Mickey L.; Lee, Kelvin W.; Kreiffels, Jerry A.; Kynett, Virgil N.; and Robinson, Kurt B., 5,463,757, Cl. 395-430.000.

Kundu, Aniruddha; and Oztaskin, Ali S., 5,463,744, Cl. 395-375.000.

Schwendinger, Greg, 5,463,748, Cl. 395-375.000.

Vidwans, Rohit A.; Boggs, Darrell D.; Fetterman, Michael A.; and Glew, Andrew F., 5,463,745, Cl. 395-375.000.

Yee, Dawson L., 5,463,658, Cl. 375-257.000.

Intergraph Corporation: *See—*

Sachs, Howard G., 5,463,750, Cl. 395-496.000.

International Business Machines Corporation: *See—*

Albaugh, Virgil A.; Muhich, John S.; Silha, Edward J.; and Vanover, Michael T., 5,463,739, Cl. 395-826.000.

Barnes, Michael S.; Keller, John H.; Logan, Joseph S.; Tompkins, Robert E.; and Westerfield, Robert P., Jr., 5,463,525, Cl. 361-234.000.

Baum, Thomas H.; Mukherjee, Shyama P.; O'Toole, Terrence R.; Tai, Alice F.; and Viehbeck, Alfred, 5,462,897, Cl. 437-230.000.

Beausoleil, William F.; Berghorn, Charles R.; Hupcey, John A.; and Schlosser, Sandra J., 5,463,754, Cl. 395-200.080.

Benhase, Michael T.; Beardsley, Brent C.; Sherman, William G., II; and Yanes, Adalberto G., 5,463,752, Cl. 395-481.000.

Brodnax, Timothy B.; Bullis, Bryan K.; King, Steven A.; Kogge, Peter M.; and Rickard, Dale A., 5,463,746, Cl. 395-375.000.

Chen, George Y.; and Lee, Edward H. P., 5,462,636, Cl. 216-17.000.

Clauberg, Rolf; Harder, Christoph; Heusch, Christan; and Jaeckel, Heinz, 5,463,705, Cl. 385-14.000.

Datta, Madhav; and Shenoy, Ravindra V., 5,462,638, Cl. 156-656.100.

DeWitt, Jimmie E.; Holck, Timothy M.; Summers, James H.; and Emrick, Samuel L., 5,463,775, Cl. 395-184.010.

Dennard, Robert H.; Meyerson, Bernard S.; and Rosenberg, Robert, 5,462,883, Cl. 437-21.000.

Desrosiers, Bernard; Louis, Didier; Pinchon, Didier; and Steimle, Andre, 5,463,574, Cl. 364-748.000.

Divakaruni, Sridhar; Dreibelbis, Jeffrey H.; Ellis, Wayne F.; Furman, Anatol; and Kalter, Howard L., 5,463,335, Cl. 327-143.000.

Dumarot, Daniel P.; and Garcia, Armando, 5,463,755, Cl. 395-475.000.

Elko, David A.; Frey, Jeffrey A.; Helffrich, Audrey A.; Isenberg, John F., Jr.; Moore, Brian B.; Nick, Jeffery M.; Swanson, Michael D.; and Williams, Joseph A., 5,463,736, Cl. 395-848.000.

Forman, Ira R.; and Madduri, Hari H., 5,463,733, Cl. 395-182.080.

Fowler, Roger G.; and Harris, Richard H., 5,461,809, Cl. 40-642.000.

Gambino, Richard J.; and Ruf, Ralph R., 5,463,578, Cl. 365-122.000.

Grill, Alfred; and Patel, Vishnubhai V., 5,462,784, Cl. 428-65.500.

Henckel, Jonathan D.; and Hospers, Paul A., 5,463,725, Cl. 395-155.000.

Iyer, Subramanian S.; Thompson, Richard D.; and Tu, King-Ning, 5,463,254, Cl. 257-757.000.

Kantner, Robert F., Jr.; Iverson, Vaughn S.; Morse, Kenneth; Pietras, Mark A.; and Rodriguez, Arturo A., 5,463,701, Cl. 382-166.000.

Levenstein, Sheldon B., 5,463,741, Cl. 395-299.000.

Mueller, Ted R., 5,463,764, Cl. 395-182.130.

Ottesen, Hal H., 5,463,758, Cl. 395-441.000.

Price, Robert T., 5,463,726, Cl. 395-155.000.

Saha, Avijit, 5,463,723, Cl. 395-134.000.

Smith, Jay L.; Trubey, Bradley S.; and Walker, Anthony D., 5,463,634, Cl. 371-20.600.

Tate, Bruce A.; Chow, Alex C.; and Gest, Stephen B., 5,463,769, Cl. 395-700.000.

Thiele, Martin, 5,462,637, Cl. 216-22.000.

Todd, Stephen J. P., 5,463,770, Cl. 395-600.000.

Viehbeck, Alfred; Goldberg, Martin; Tisdale, Stephen L.; Buchwalter, Stephen L.; Grebe, Kurt R.; Kovac, Caroline A.; and Matthew, Linda C., 5,462,628, Cl. 156-281.000.

Yasrebi, Mehrad, 5,463,625, Cl. 370-85.130.

Zimmerman, Steven M., 5,463,269, Cl. 313-309.000.

International Business Machines Incorporated: *See—*

Riggio, Salvatore R., Jr., 5,463,339, Cl. 327-206.000.

International Computers Limited: *See—*

Theobald, Leonard, 5,463,562, Cl. 364-489.000.

International Enviromelting Corporation: *See—*

Balcar, Gerald P.; and Dwivedi, Anurag, 5,462,570, Cl. 65-17.100.

International Flavors & Fragrances Inc.: *See—*

Monteleone, Michael G.; Weiss, Richard A.; Evans, Mark D.; and Hanna, Marie R., 5,462,923, Cl. 512-19.000.

International Medical Associates, Inc.: *See—*

D'Angelo, Joseph P.; Schur, Henry B.; Han, Kedu; and Glenn, Daniel J., 5,462,064, Cl. 128-771.000.

Inujima, Takashi: *See—*

Yamazaki, Shunpei; and Inujima, Takashi, 5,462,767, Cl. 427-248.100.

Inviro Medical Devices Ltd.: *See—*

Novacek, Laurel A.; Sharp, Fraser R.; and McLean, Donald A., 5,462,531, Cl. 604-110.000.

Iowa State University Research Foundation, Inc.: *See—*

Gschneidner, Karl A., Jr.; and Takeya, Hiroyuki, 5,462,610, Cl. 148-301.000.

Papadakis, Emmanuel P.; Russell, Steve F.; and Wormley, Samuel J., 5,461,921, Cl. 73-628.000.

Ireland, Kelly D.: *See—*

Green, Robert R.; and Ireland, Kelly D., 5,462,117, Cl. 166-297.000.

Irie, Yasuo: *See—*

Sumikawa, Michito; Koguchi, Yoshihito; Ohgane, Takao; Irie, Yasuo; and Takahashi, Satoji, 5,463,116, Cl. 562-450.000.

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Josefsson, Paer; Jacobsson, Kurt A. G.; and Tholander, Lars H. G., 5,462,094, Cl. 139-194.000.

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Irox-NKK Co., Ltd.: *See—*

Sugiyama, Shunichi; Kametani, Hiroshi; Yoshikoshi, Hideyuki; Ikeda, Nobuaki; and Hara, Tomihiro, 5,462,686, Cl. 252-62.620.

Isao, Kiba; and Masamichi, Kaneko, to Asahi Kasei Kogyo Kabushiki Kaisha. Process for recycling expanded particle moldings. 5,462,233, Cl. 241-18.000.

Ise, Koichi, to Sony Corporation. Image pickup optical system which minimizes the effects of spurious signals. 5,463,496, Cl. 359-497.000.

Iseki, Masami: *See—*

Kawasaki, Somei; and Iseki, Masami, 5,463,329, Cl. 326-77.000.

Isenberg, John F., Jr.: *See—*

Elko, David A.; Frey, Jeffrey A.; Helffrich, Audrey A.; Isenberg, John F., Jr.; Moore, Brian B.; Nick, Jeffery M.; Swanson, Michael D.; and Williams, Joseph A., 5,463,736, Cl. 395-848.000.

Ish, A. Buell, III, to Vectra Fitness, Inc. Single effort, double action exercise bench. 5,462,510, Cl. 482-142.000.

Ishida, Noriya: *See—*

Onoue, Takashi; Araki, Kiyoshi; Ishida, Noriya; Kitamura, Toshiya; Niitsu, Yasuhiko; Yanagisawa, Makiko; Sakamoto, Ryo; and Sato, Fumihiro, 5,462,821, Cl. 429-218.000.

Ishida, Tessho: *See—*

Nishida, Junichi; Araki, Morio; Arakawa, Takeharu; Ishida, Tessho; Ayukai, Yasushiro; Baba, Toshiharu; Sakaguchi, Masahiko; Nobe, Kenichi; Kaneko, Michihiro; and Shinohara, Jun, 5,463,605, Cl. 369-58.000.

Ishihara, Yuji: *See—*

Goto, Giichi; Miyamoto, Masaomi; and Ishihara, Yuji, 5,462,934, Cl. 514-183.000.

Ishii, Makoto: *See—*

Iino, Yukio; Ishii, Makoto; Ohsumi, Koji; and Tsuji, Takashi, 5,463,078, Cl. 548-541.000.

Ishii, Tatsuya, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor memory comprising a memory cell without a transistor. 5,463,235, Cl. 257-300.000.

Ishii, Yoshibumi: *See—*

Niimi, Masahiro; Hariu, Yukari; Kataura, Koichi; Ishii, Yoshibumi; and Kato, Kazuaki, 5,462,864, Cl. 435-100.000.

Ishii, Yutaka, to Sharp Kabushiki Kaisha. Method of forming an optical compensating plate of a liquid crystal display apparatus. 5,462,621, Cl. 156-229.000.

Ishikawa, Hiroaki: *See—*

Kawashima, Makoto; Nagano, Kazuhiro; Hori, Kazuyoshi; Ishikawa, Hiroaki; and Morishita, Masataka, 5,462,929, Cl. 514-43.000.

Ishikawa, Hiroyuki: *See—*

Ogura, Kuniaki; Ishikawa, Hiroyuki; Maeda, Yoshiaki; and Komamura, Kouichi, 5,462,577, Cl. 75-345.000.

Ishikawa, Masaaki; and Yamada, Masao, to Tamapack Co., Ltd. Display device for a vehicle. 5,463,370, Cl. 340-439.000.

Ishikawa, Shinji: *See—*

Yui, Dai; Suganuma, Hiroshi; Ishikawa, Shinji; and Semura, Shigeru, 5,463,708, Cl. 385-49.000.

Ishikawa, Toru, to NEC Corporation. Dynamic random access memory device having word line intermittently driven to active level. 5,463,592, Cl. 365-230.060.

Ishikawa, Toru: *See—*

Inaba, Shigeru; Fukuhara, Masaaki; Hirota, Makoto; Yamamoto, Mitsuo; Abe, Jun; Miyata, Hideaki; Sunaga, Takayuki; Ishikawa, Toru; Shiina, Yoshio; Isosu, Toru; and Kanno, Makoto, 5,463,452, Cl. 355-246.000.

Ishikawa, Yoshio, to Otsuka Kagaku Kabushiki Kaisha. Artificial turf, pile yarn for artificial turf and process and spinneret for producing pile yarn. 5,462,778, Cl. 428-17.000.

Ishino, Tsutomu; and Kitamoto, Masahiro, to Daikin Industries, Ltd. Vuilleumier heat pump device. 5,461,869, Cl. 62-6.000.

Ishitani, Koichi: *See—*

Doi, Yukio; Zhang, Wei-Zhong; Ishitani, Koichi; and Kinugasa, Masayoshi, 5,462,988, Cl. 524-501.000.

Ishizuka, Jiro: *See—*

Takeuchi, Tatsuo; Nami, Yasuo; and Ishizuka, Jiro, 5,463,457, Cl. 355-313.000.

Ishizuka, Kaoru: *See—*

Iji, Masahiro; Yoda, Masami; Suzuki, Shin; Ishizuka, Kaoru; Kubo, Sotoo; Yamaki, Isao; and Hashimoto, Toshikuni, 5,462,672, Cl. 210-727.000.

Iskay Serviceis Metalurgicos Srl.: *See—*

Aragonés, Juan L. B., 5,462,720, Cl. 423-27.000.

Isobe, Minoru; Yoshimura, Koutaro; and Togashi, Shigemi, to Oki Electric Industry Co., Ltd. Printer and data processing apparatus having printing unit. 5,462,375, Cl. 400-680.000.

Isoda, Hideo; Hamaguchi, Tadaaki; Sakuda, Mitsuhiro; and Yamada, Yasushi, to Toyo Boseki Kabushiki Kaisha. Structured fiber material comprised of composite fibers coiled around crimped short fibers. 5,462,793, Cl. 428-297.000.

Isogai, Naoki; Mimura, Yoshiaki; and Fujieda, Masanao, to Nidek Co., Ltd. Examination apparatus for examining an object having a spheroidal reflective surface. 5,463,430, Cl. 351-208.000.

Isomura, Yasuo: *See—*

Tamazawa, Kazuharu; Kojima, Tadao; Arima, Hideki; Murakami, Yukiyasu; Isomura, Yasuo; Okada, Minoru; Takanobu, Kiyoshi; and Takenaka, Toichi, 5,463,064, Cl. 546-281.000.

Isono, Toshio, to NEC Corporation. Semiconductor integrated circuit device having an electrode pad including an extended wire bonding portion. 5,463,255, Cl. 257-773.000.

Isosu, Toru: *See—*
Inaba, Shigeru; Fukuhara, Masaaki; Hirota, Makoto; Yamamoto, Mitsuo; Abe, Jun; Miyata, Hideaki; Sunaga, Takayuki; Ishikawa, Toru; Shiina, Yoshio; Isosu, Toru; and Kanno, Makoto, 5,463,452, Cl. 355-246.000.

Isozaki, Masakazu: *See—*
Watanabe, Naoki; Okutsu, Hirokazu; Isozaki, Masakazu; and Inoue, Kenji, 5,463,444, Cl. 355-27.000.

Israel, Barbara A.: *See—*
Letchworth, Geoffrey J., III; and Israel, Barbara A., 5,462,734, Cl. 424-229.100.

Israel, Mark; and Fuchs, Neil E., to Diesel Engine Retarders, Inc. Hydraulic circuits for compression release engine brakes. 5,462,025, Cl. 123-321.000.

Ito, Ikuo: *See—*
Muroi, Takashiro; Sato, Toshio; Ito, Ikuo; and Takeda, Kyoichi, 5,463,156, Cl. 585-400.000.

Ito, Kengo; Mizumachi, Motohiro; Fujiwara, Yoshio; and Shinohara, Satoru, to Sony Corporation. Composition for fixing water-color ink, cover film for thermal transfer image using composition for fixing water color-ink, and thermal transfer image recorded medium. 5,462,910, Cl. 503-227.000.

Ito, Michio: *See—*
Yamada, Hiromichi; Ohkubo, Masaharu; Ojima, Masaki; Sasame, Hiroshi; Kawana, Takashi; Seto, Kaoru; Mano, Hiroshi; Saito, Tetsuo; Kashihara, Atsushi; and Ito, Michio, 5,463,473, Cl. 358-300.000.

Ito, Noritoshi; Amada, Yoshiho; and Wakabayashi, Osamu, to Kabushiki Kaisha Komatsu Seisakusho. Apparatus for controlling output of an excimer laser device. 5,463,650, Cl. 372-57.000.

Ito, Susumu; and Kojima, Kunio, to Fanuc Ltd. Injection molding machine. 5,462,428, Cl. 425-567.000.

Ito, Takashi: *See—*
Yashiki, Yuichi; Hondumi, Masahiko; Ohki, Yuzuru; Ito, Takashi; Nakjajima, Fumitaka; Mori, Masakazu; Aoki, Takayoshi; Mizuishi, Harumitsu; and Shibuya, Yuusaku, 5,463,456, Cl. 355-299.000.

Ito, Takayuki; and Abe, Tetsuya, to Asahi Kogaku Kogyo Kabushiki Kaisha. Zoom lens system. 5,463,499, Cl. 359-692.000.

Ito, Teruomi: *See—*
Inoue, Kazuhiro; Ito, Teruomi; Okuno, Satoshi; and Aono, Katsutoshi, 5,463,022, Cl. 530-322.000.

Itoh, Akihiko: *See—*
Oshima, Toshio; Ohiwa, Tsunemi; Nishida, Masato; Matsumoto, Taiji; Itoh, Akihiko; and Takeuchi, Yoji, 5,463,212, Cl. 235-468.000.

Itoh Electric Company Limited: *See—*
Kobayashi, Kazuaki; and Kobayashi, Kazuo, 5,462,156, Cl. 198-788.000.

Itoh, Motoi: *See—*
Kobayashi, Masanobu; Itoh, Motoi; Matsuhisa, Yoji; and Shimizu, Kazuharu, 5,462,799, Cl. 428-364.000.

Itoh, Toyotsugu: *See—*
Kawada, Sunao; Inagi, Masataka; Iwamura, Yoshio; Itoh, Toyotsugu; and Hashimoto, Takayoshi, 5,463,503, Cl. 359-838.000.

Itonaga, Kazumasa: *See—*
Kobayakawa, Takashi; Imura, Satoshi; Itonaga, Kazumasa; and Kuramoto, Kazuhiko, 5,462,698, Cl. 252-586.000.

Itou, Takaaki; Tanaka, Hiroshi; Takeda, Keiso; Ohnaka, Hidemi; Kunitake, Kazuhisa; and Tanahashi, Toshio, to Toyota Jidosha Kabushiki Kaisha. Engine exhaust gas purification device. 5,461,857, Cl. 60-276.000.

ITT Corporation: *See—*
Anhalt, John W., 5,462,445, Cl. 439-188.000.
Randall, Richard D.; and Bucher, Alan W., 5,462,226, Cl. 236-93.00R.

Iv, Van-Tha: *See—*
Guardiola, Pierre-Henri; Iv, Van-Tha; Metzger, Albert; Cleon, Louis-Marie; and Dannawi, Marwan, 5,462,144, Cl. 188-377.000.

Iverson, Vaughn S.: *See—*
Kantner, Robert F., Jr.; Iverson, Vaughn S.; Morse, Kenneth; Pietras, Mark A.; and Rodriguez, Arturo A., 5,463,701, Cl. 382-166.000.

Ives, Kenneth D.; and McClellan, John T., to Acutus Industries, Inc. Shear web load cell having thermal compensation. 5,461,933, Cl. 73-862.623.

Ivey, Glen E.: *See—*
Whiting, Douglas L.; George, Glen A.; and Ivey, Glen E., 5,463,390, Cl. 341-51.000.

Iwabuchi, Katsuhiko, to Tokyo Electron Limited; and Tokyo Electron Tohoku Limited. Processing apparatus. 5,462,397, Cl. 414-222.000.

Iwai, Daisuke: *See—*
Fukumoto, Takehiko; Iwai, Daisuke; Okano, Shigeo; Suzuki, Hiroshi; and Oshima, Mitsuyoshi, 5,463,149, Cl. 570-135.000.

Iwai, Kazumi: *See—*
Inoue, Hiroshi; Tsukahara, Satoshi; and Iwai, Kazumi, 5,461,855, Cl. 60-39.060.

Iwaki, Kazumi: *See—*
Yamamori, Teruo; Harada, Hiroshi; Sakai, Katsunori; Iwaki, Kazumi; and Matsunaga, Kazuki, 5,462,936, Cl. 514-211.000.

Iwaki, Takashi: *See—*
Kosaka, Yoko; Takiguchi, Takao; Iwaki, Takashi; Togano, Takeshi; Nakamura, Shinichi; and Nakazawa, Ikuo, 5,462,694, Cl. 252-299.610.

Iwamura, Yoshio: *See—*
Kawada, Sunao; Inagi, Masataka; Iwamura, Yoshio; Itoh, Toyotsugu; and Hashimoto, Takayoshi, 5,463,503, Cl. 359-838.000.

Iwao, Toru; Hirai, Kenichi; Kondoh, Nobuo; Yamanouchi, K[illegible]hi; and Yokoyama, Kazumasa, to Green Cross Corporation, The. Pharmaceutical composition containing slightly water-soluble drug. 5,462,951, Cl. 514-334.000.

Iwasa, Tadashi: *See—*
Kawasaki, Hiroaki; Sakurada, Hiroshi; Narushima, Shinichi; Iwasa, Tadashi; and Yamaguchi, Hiroshi, 5,463,276, Cl. 313-496.000.

Iwasaki, Motoya, to NEC Corporation. Method and arrangement of pointing an antenna beam to a stationary satellite. 5,463,401, Cl. 342-359.000.

Iwasaki, Nobuyuki, to Fuji Photo Film Co., Ltd. Method of forming radiation images and silver halide photographic material therefor. 5,462,832, Cl. 430-139.000.

Iwase, Norimichi; Morinaka, Yasuhiro; Tamao, Yoshikuni; Kanayama, Toshiji; and Yamada, Kumi, to Mitsubishi Chemical Corporation. 3,6-disubstituted pyradazine derivatives. 5,462,941, Cl. 514-248.000.

Iwata, Shunichi; and Shimizu, Toru, to Mitsubishi Denki Kabushiki Kaisha. Microprogram data processor processing operand address calculation and instruction execution with common hardware. 5,463,747, Cl. 395-375.000.

Iwata, Toshinori; and Ota, Manabu, to Sharp Kabushiki Kaisha. Four-way change-over valve for air-conditioner and service valve therewith. 5,462,085, Cl. 137-625.430.

Iwata, Yoichi, to Toyota Jidosha Kabushiki Kaisha. Apparatus for thermally controlling an oxygen sensor of internal combustion engine. 5,461,902, Cl. 73-23.320.

Iwatani, Hidetoshi; Fujino, Masato; Matsumoto, Shinji; Fujii, Choichiro; and Kazama, Masakazu, to Murata Mfg. Co., Ltd. Coil. 5,463,365, Cl. 336-98.000.

Iwinski, Dean J., to Snap-on Incorporated. T-shaped reversible ratchet tool. 5,461,950, Cl. 81-61.000.

Iyer, Subramanian S.; Thompson, Richard D.; and Tu, King-Ning, to International Business Machines Corporation. Formation of 3-dimensional silicon silicide structures. 5,463,254, Cl. 257-757.000.

Izumi, Masayoshi: *See—*
Maeda, Takashi; Furukido, Takeshi; Hoshino, Kousaku; Udo, Satoru; and Izumi, Masayoshi, 5,462,291, Cl. 277-100.000.

Izumi, Shuji: *See—*
Shintani, Dai; Okada, Hiroyuki; Hoda, Takeo; Izumi, Shuji; Mukai, Hiromu; Hatamori, Osamu; and Tsuji, Sadafusa, 5,463,436, Cl. 354-81.000.

Izumida, Tatsuo: *See—*
Nishi, Takashi; Matsuda, Masami; Noshita, Kenji; Kikuchi, Makoto; Izumida, Tatsuo; Tamata, Shin; and Kiuchi, Yoshimasa, 5,463,171, Cl. 588-4.000.

Jaco, Paul R.: *See—*
Green, Charlie W.; and Jaco, Paul R., 5,461,822, Cl. 43-122.000.

Jacobi, Detlef; Jendralla, Heiner; and Kammermeier, Bernhard, to Hoechst Aktiengesellschaft. Process for the diastereoselective reductive pinacol coupling of homochiral α-aminoaldehydes. 5,463,124, Cl. 564-155.000.

Jacobson, Michael B.: *See—*
Voigt, Douglas L.; and Jacobson, Michael B., 5,463,776, Cl. 395-600.000.

Jacobson, Peter; Kroiss, Daniel; and Henry, Christine, to ELA Medical, S.A. Methods and apparatus for determining when tachyarrythmia is pace-terminable. 5,462,060, Cl. 128-702.000.

Jacobsson, Kurt A. G.: *See—*
Josefsson, Paer; Jacobsson, Kurt A. G.; and Tholander, Lars H. G., 5,462,094, Cl. 139-194.000.

Jactoys Limited: *See—*
Lei, Cheong S., 5,462,469, Cl. 446-15.000.

Jacus, Robert J.; Senn, James A.; and Kusel, Kenneth R., to Rayovac Corporation. Rechargeable alkaline round cell having hot melt barrier. 5,462,819, Cl. 429-174.000.

Jaeckel, Heinz: *See—*
Clauberg, Rolf; Harder, Christoph; Heusch, Christan; and Jaeckel, Heinz, 5,463,705, Cl. 385-14.000.

Jaeger, Ulrich: *See—*
Keller, Harald; Jaeger, Ulrich; Steininger, Helmut; Kopke, Helmut; Schomann, Klaus D.; and Schildberg, Hans-Peter, 5,462,810, Cl. 428-694.00T.

Jäger, Arnold. Roller belt arrangement for caterpillar track-type vehicles. 5,462,495, Cl. 474-209.000.

Jäger, Horst; Stöhr, Frank-Michael; and Schündehütte, Karl K., to Bayer Aktiengesellschaft. Reactive dyestuffs. 5,463,031, Cl. 534-618.000.

Jahreiss, Lothar: *See—*
Calderara, Reto; Jahreiss, Lothar; Sonderegger, Hans C.; and Caprez, Markus, 5,461,924, Cl. 73-786.000.

Jain, Rakesh: *See—*
Curtis, Ralston; Jain, Rakesh; Creech, David C.; and Fitch, William L., 5,462,915, Cl. 504-323.000.

Jakob, Gert; and Schimitzek, Ralph, to Robert Bosch GmbH. Valve subassembly for a slip-regulated hydraulic brake system. 5,462,344, Cl. 303-119.200.

Jaksic, Miroslav. Seat belt construction. 5,462,310, Cl. 280-808.000.

Jakubowycz, Stan. Esterification catalyst for the production of high boiling esters and process of making the high boiling esters. 5,462,906, Cl. 502-232.000.

Jalaguier, Jean P.; and Krysinski, Tomasz, to Societe Anonyme dite: Eurocopter France. Gunsight device for rotating-wing aircraft. 5,461,796, Cl. 33-233.000.

James, Douglas J.; Andrews, Kenneth J.; and McKee, Terrence J., to Lumonics Inc. Marking of a workpiece by light energy. 5,463,200, Cl. 219-121.680.

Jang, G. David. Intravascular catheter with bailout feature. 5,462,530, Cl. 604-160.000.

Jang, Young C.: *See—*

Lee, Kab Y.; Yoo, Hee-Sang; and Jang, Young C., 5,461,875, Cl. 62-89.000.

Jankowski, Robert C.: *See—*

Falcoff, Allan F.; Delano, James A.; Albers, Robert E.; and Jankowski, Robert C., 5,462,601, Cl. 118-697.000.

Jansen, Benedictus; Roefs, André; Sels, Francis; Perdieus, Pieter; and Florens, Raymond, to Agfa-Gevaert, N.V. Processing of silver halide photographic industrial X-ray films. 5,462,831, Cl. 430-139.000.

Janssen Pharmaceutica N.V.: *See—*

De Knaep, Alfons G. M.; Moens, Luc J. R.; and Vreysen, Eduard J. C., 5,463,049, Cl. 540-556.000.

Janssens, Wilhelmus; and Vanmaele, Luc, to AGFA-Gevaert, N.V. Dyes and dye-donor elements for thermal dye transfer recording. 5,463,045, Cl. 546-158.000.

Jansson, Ulf; and Ekholm, Rolf, to Kvaerner Pulping Technologies Aktiebolag. Suspension-treating device. 5,461,888, Cl. 68-181.00R.

Japan Elanco Company Limited: *See—*

Yamamoto, Taizo; Konishi, Hirokazu; Kawaguchi, Yoshihisa; and Nagao, Akira, 5,463,465, Cl. 356-394.000.

Japan Energy Corporation: *See—*

Shinjo, Teruya; Yamamoto, Hidefumi; Anno, Toshihiko; and Takada, Toshio, 5,462,795, Cl. 428-332.000.

Japan Gore-Tex, Inc.: *See—*

Sugiyama, Norihide; Nakamura, Masaru; Moriyama, Sumihiro; and Sasaki, Fumihiro, 5,462,586, Cl. 96-13.000.

Japan Steel Works, Ltd., The: *See—*

Imamura, Yukio, 5,462,426, Cl. 425-190.000.

Japan Tobacco Inc.: *See—*

Daimon, Junko; Takeda, Yasuo; and Kodama, Katsunori, 5,461,825, Cl. 47-71.000.

Jarrott, Bevyn: *See—*

Roba, Joseph L.; Gillet, Claude L.; Rafferty, Michael F.; Jarrott, Bevyn; and Beart, Philip M., 5,462,965, Cl. 514-443.000.

Jaskie, James E.: *See—*

Kato, Yumiko; Jaskie, James E.; and Wiemann, David A., 5,463,273, Cl. 313-461.000.

Javvaji, Anand K.: *See—*

Chiang, Marilyn C.; Fenley, R. Earl, Jr.; Holland, George F.; Javvaji, Anand K.; and Sreedhara, Ramadevi, 5,463,670, Cl. 379-27.000.

Jayant, Nuggehally S.: *See—*

Dorward, Sean M.; Jayant, Nuggehally S.; Johnston, James D.; Quackenbush, Schuyler R.; Seshadri, Nambirajan; and Sundberg, Carl-Erik W., 5,463,641, Cl. 371-374.000.

Jeanneret, Sylvain: *See—*

de Rooij, Nicolaas Frans; Jeanneret, Sylvain; Gass, Volker; and van der Schoot, Bart, 5,462,839, Cl. 430-320.000.

Jebe, Tod A.: *See—*

Matlock, Mark G.; Sleeter, Ronald T.; and Jebe, Tod A., 5,463,321, Cl. 324-439.000.

Jeffers, Frank D.: *See—*

Wilson, Richard A., Jr.; Daubner, John M.; and Jeffers, Frank D., 5,463,552, Cl: 364-436.000.

Jeffers, Scott E.; and Frankel, David B., to Caterpillar Inc. Stackable counterweight arrangement. 5,462,309, Cl. 280-759.000.

Jeffery, Edwin A.: *See—*

Brightman, Timothy H.; Gulick, Kenneth; Hanson, Robert L.; Herrick, Brian R.; Jeffery, Edwin A.; Kozo, Maria J.; and Swanson, Carl A., 5,462,350, Cl. 312-351.700.

Jelich, Klaus: *See—*

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Jendralla, Heiner: *See—*

Jacobi, Detlef; Jendralla, Heiner; and Kammermeier, Bernhard, 5,463,124, Cl. 564-155.000.

Jeneric/Pentron Incorporated: *See—*

Prasad, Arun; and Schulman, Martin, 5,462,437, Cl. 433-207.000.

Jenike & Johanson, Inc.: *See—*

Royal, T. Anthony, 5,462,351, Cl. 366-101.000.

Jenner, Martin: *See—*

Reichl, Asta; Jenner, Martin; Witzig, Armin; Rose, Anita; and Kuenzl, Bernd, 5,462,359, Cl. 374-148.000.

Jenness, Steven M., to Digital Equipment Corporation. Object oriented computer architecture using directory objects. 5,463,774, Cl. 395-600.000.

Jenniges, Randal L.: *See—*

Harvey, Dennis N.; and Jenniges, Randal L., 5,463,463, Cl. 356-375.000.

Jennings, Alfred R., Jr.; and Chambers, Michael R., to Mobil Oil Corporation. Method for enhanced cleanup of horizontal wells. 5,462,118, Cl. 166-312.000.

Jensen, Wayne, to B & J Manufacturing Co. Compound elliptical tire rasp blade. 5,461,762, Cl. 29-78.000.

Jentsch, Dietrich: *See—*

Tillmann, Horst; Jentsch, Dietrich; Hering, Thomas; Warschewitz, Thomas; Sichelschmidt, Dieter; and Winkler, Bernd, 5,461,754, Cl. 16-82.000.

Jesuit Community at Loyola University: *See—*

Upton, Winfred R., 5,461,939, Cl. 74-562.500.

Jgorevich, Shevchenko A. Water jet propulsive device. 5,462,461, Cl. 440-38.000.

Jiang, Shu-Fang: *See—*

Chen, Jui-Hsiang; Wei, Jeng; Hu, Andrew T.; Lee, Yu-Der; Laiw, Ru-Fong; Chen, Muh-Lan; Chang, Chung-Yi; Lee, Fan-Yen; and Jiang, Shu-Fang, 5,462,704, Cl. 264-41.000.

Jidosha Kiki Co., Ltd.: *See—*

Koyano, Hitoshi; and Sakaguchi, Shozo, 5,462,341, Cl. 303-9.750.

Jina Manufacturer Thai Co., Ltd.: *See—*

Chien, Jui-Lung, 5,462,300, Cl. 280-87.051.

Johann Knupp GmbH & Co.: *See—*

Knoop, Heinz-Peter, 5,461,759, Cl. 24-555.000.

Johansson, Clas-Göran, to Alfa-Laval Food Engineering AB. Plate heat exchanger. 5,462,112, Cl. 165-167.000.

Johnen, Rolf: *See—*

Hering, Jürgen; Johnen, Rolf; and Upper, Gerd, 5,462,287, Cl. 277-37.000.

Hering, Jürgen; Johnen, Rolf; and Upper, Gerd, 5,462,288, Cl. 277-37.000.

Johnson, Anthony J.: *See—*

MacDonald, Lindsay W.; Johnson, Anthony J.; and Luo, Ronnier, 5,463,480, Cl. 358-520.000.

Johnson, Arthur F., to Energy Conversation Partnership, Ltd. Method of producing hydroelectric power. 5,461,858, Cl. 60-325.000.

Johnson, Douglas A., to Texas Instruments Incorporated. User controlled trap handler. 5,463,778, Cl. 395-775.000.

Johnson, George N., to Fearing Manufacturing Co., Inc. Panel insert for temporary attachment to animal identification tags. 5,461,805, Cl. 40-301.000.

Johnson, George N., to Fearing Manufacturing Company. Animal eartag electronic transponder. 5,461,807, Cl. 40-301.000.

Johnson, James C., to National Service Industries, Inc. Light emitting diode retrofit lamp. 5,463,280, Cl. 315-187.000.

Johnson, James R.: *See—*

Ingram, Paul M., Jr.; Johnson, James R.; and Givens, Fenton L., 5,462,357, Cl. 374-124.000.

Johnson, Mark T.: *See—*

Layne, James L.; and Johnson, Mark T., 5,462,369, Cl. 384-538.000.

Johnson Service Company: *See—*

Pascucci, Gregory A.; Rasmussen, David E.; Decious, Gaylon M.; Garbe, James R.; Hyzer, Susan M.; Woest, Karen L.; Vairavan, Vairavan; Koch, David L.; Gottschalk, Donald A., Jr.; Burkhardt, Dennis E.; Standish, Darrell E.; Madaus, Paul W.; Spacek, Dan J.;, 5,463,735, Cl. 395-200.100.

Johnson, Stephen P.: *See—*

Hassler, Stephen P.; Johnson, Stephen P.; and Lapp, John, 5,463,366, Cl. 337-176.000.

Johnston, James D.: *See—*

Dorward, Sean M.; Jayant, Nuggehally S.; Johnston, James D.; Quackenbush, Schuyler R.; Seshadri, Nambirajan; and Sundberg, Carl-Erik W., 5,463,641, Cl. 371-374.000.

Joichi, Masahiko; and Furukawa, Yoshihisa, to NEC Corporation. Data transfer control unit with memory unit fault detection capability. 5,463,767, Cl. 395-183.130.

Jonak, Zdenka L.; Debouck, Christine; Clark, Robert; and Trulli, Stephen, to SmithKline Beecham Corporation. Human lymphoid cells expressing human immunodeficiency virus envelope protein GP160. 5,462,872, Cl. 435-240.200.

Jonas, Friedrich, to Agta-Gevaerf AG. Thiophene derivatives. 5,463,056, Cl. 544-350.000.

Jones, C. Andrew: *See—*

Gaffney, Anne M.; and Jones, C. Andrew, 5,462,971, Cl. 521-40.000.

Jones, Charles D.; and Tinsley, Frank C., to Eli Lilly and Company. Methods of inhibiting fertility in women. 5,462,949, Cl. 514-324.000.

Jones, Franklin B.; Nguyen, Ngon B.; and Laurandeau, Leroy, to Westinghouse Electric Corp. Modular solid state relay. 5,463,252, Cl. 257-723.000.

Jones, Franklin B.: *See—*

Nguyen, Ngon B.; and Jones, Franklin B., 5,463,250, Cl. 257-698.000.

Jones, Greg; and Wyatt, Daryn. Method for constructing a spray in place structure. 5,462,764, Cl. 427-196.000.

Jones, Philip J., to Raychem Corporation. Liquid crystal composite with droplets of plural chiral nematic materials with different reflection bands. 5,463,482, Cl. 359-51.000.

Jones, Roy, to CSL Lighting Mfg. Inc. Incandescent to fluorescent light conversion kit. 5,463,540, Cl. 362-260.000.

Jones, Steven C.; Mukherjee, Subhashish; and Kwan, Stephen C., to Texas Instruments Incorporated. MOS uni-directional, differential voltage amplifier capable of amplifying signals having input common-mode voltage beneath voltage of lower supply and integrated circuit substrate. 5,463,347, Cl. 330-253.000.

Jones, William C., Jr.; Polley, Richard B.; and Sanzo, Roger F., to GSI Engineering, Inc. Cast bolt-on mounting bracket for supporting a disc brake on a railcar truck. 5,462,139, Cl. 188-206.00R.

Joo, Jinsoo: *See—*

Epstein, Arthur J.; Roe, Mitchell G.; Ginder, John M.; Hajiseyedjavadi, Hamid; and Joo, Jinsoo, 5,463,014, Cl. 528-210.000.

Jordal, Robert L. Awing window with lock. 5,461,828, Cl. 49-90.100.

Jordan, Donald J. Tensiometer. 5,461,929, Cl. 73-831.000.

- Jordan, Hermann; Krammer, Erich; Rogatschnig, Johann T.; Den Ouden, Petronella H.; and Span, Francis J., to U.S. Philips Corporation. Disc-type depilation apparatus with force transmission studs. 5,462,557, Cl. 606-133.000.
- Jordan, P. Kurt: *See—*
  - Funderburk, C. Michael; Jordan, P. Kurt; Newman, John A.; McEwen, J. C.; and Howell, David C., 5,461,998, Cl. 112-306.000.
- Jørgensen, Peter N.: *See—*
  - Bonnichsen, Frits F.; and Jørgensen, Peter N., 5,462,535, Cl. 604-272.000.
- Josef Koberlein Maschinen- und Vorrichtungsbau: *See—*
  - Demar, Adelbert; Ebner, Wolfgang; Meinfelder, Horst; and Köberlein, Josef, 5,462,155, Cl. 198-760.000.
- Josefsson, Paer; Jacobsson, Kurt A. G.; and Tholander, Lars H. G., to IRO AB. Sensor activated weft tension device. 5,462,094, Cl. 139-194.000.
- Josefsson, Paer: *See—*
  - Svanstroem, Anders; and Josefsson, Paer, 5,462,096, Cl. 139-452.000.
- Joshua Group Ltd.: *See—*
  - Markland, Max C., 5,462,506, Cl. 482-51.000.
- Jost, Thomas: *See—*
  - Stief, Reinhard; Müller-Broll, Gerhard; Jost, Thomas; Mattutat, Manfred; and Schmitt, Klaus-Dieter, 5,462,331, Cl. 296-198.000.
- Joyce, Michael P.: *See—*
  - Martinez, Jose, Jr.; and Joyce, Michael P., 5,462,377, Cl. 401-185.000.
- JT AGRIS Corp.: *See—*
  - Daimon, Junko; Takeda, Yasuo; and Kodama, Katsunori, 5,461,825, Cl. 47-71.000.
- JTAG Technologies B.V.: *See—*
  - De Lange, Willem J., 5,463,638, Cl. 371-22.300.
- Jubran, Nusrallah, to Minnesota Mining and Manufacturing. System for inkless fingerprinting. 5,462,597, Cl. 118-31.500.
- Juds, Scott, to Auto-Sense, Ltd. Collision avoidance system for vehicles. 5,463,384, Cl. 340-903.000.
- Julian, Thomas N.: *See—*
  - Radebaugh, Galen W.; Julian, Thomas N.; and Glinecke, Robert, 5,462,747, Cl. 424-465.000.
- Jundt, Jacques A.: *See—*
  - Bonner, Stephen D.; Rosthal, Richard A.; Bagersh, Abdullah A.; Luling, Martin G.; and Jundt, Jacques A., 5,463,320, Cl. 324-366.000.
- Jung, Udo; Eidam, Herbert; and Gerk, Wilhelm, to Babcock BSH Aktiengesellschaft Vormals Butner-Schilde-Haas AG. Clean-room ceiling module. 5,462,484, Cl. 454-187.000.
- Juskey, Frank J., Jr.: *See—*
  - Carson, Robert T.; Hogrefe, Arnold W.; and Juskey, Frank J., Jr., 5,463,190, Cl. 174-259.000.
- K.H. Innovations Oy: *See—*
  - Holm, Kaj, 5,462,582, Cl. 95-175.000.
- K.K. Holding AG: *See—*
  - Calderara, Reto; Jahreiss, Lothar; Sonderegger, Hans C.; and Caprez, Markus, 5,461,924, Cl. 73-786.000.
- Kaba, James T. C.: *See—*
  - Taylor, Herbert H.; and Kaba, James T. C., 5,463,732, Cl. 395-163.000.
- Kabeshita, Akira: *See—*
  - Kanayama, Shinji; Kabeshita, Akira; Nishino, Kenichi; Ohnakada, Satoshi; Murata, Takahiko; Kimura, Kazuhiro; and Nishida, Kazuto, 5,462,626, Cl. 156-272.800.
- Kabushiki Kaisha Ace Denken: *See—*
  - Takemoto, Takatoshi, 5,462,277, Cl. 273-121.00B.
- Kabushiki Kaisha Kobe Seiko Sho: *See—*
  - Egami, Akira; and Ehira, Masaya, 5,462,901, Cl. 501-87.000.
- Kabushiki Kaisha Komatsu Seisakusho: *See—*
  - Ito, Noritoshi; Amada, Yoshiho; and Wakabayashi, Osamu, 5,463,650, Cl. 372-57.000.
  - Yamamoto, Shigeru; Matsushita, Shigenori; Zhang, Shu H.; Nishita, Satoru; and Nakata, Kazushi, 5,462,122, Cl. 172-2.000.
- Kabushiki Kaisha Kosmek: *See—*
  - Arisato, Akira, 5,462,084, Cl. 137-614.030.
- Kabushiki Kaisha Machida Seisakusho: *See—*
  - Komachi, Yuichi; and Wakaki, Moriaki, 5,463,651, Cl. 372-92.000.
- Kabushiki Kaisha Meidensha: *See—*
  - Hasegawa, Kazsuya, 5,463,713, Cl. 395-2.690.
- Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho: *See—*
  - Imai, Keisuke; and Tsukiyama, Naohiro, 5,462,340, Cl. 297-478.000.
- Kabushiki Kaisha Topcon: *See—*
  - Suzuki, Takeshi; and Sugiyama, Akihiro, 5,463,431, Cl. 351-226.000.
- Kabushiki Kaisha Toshiba: *See—*
  - Hiruta, Yoichi, 5,463,245, Cl. 257-620.000.
  - Kagaya, Shinichiro, 5,463,668, Cl. 378-98.200.
  - Kawano, Mitsumo, 5,463,309, Cl. 323-315.000.
  - Kubo, Hitoshi, 5,463,763, Cl. 395-182.020.
  - Kubo, Masahiko, 5,463,241, Cl. 257-376.000.
  - Kuga, Masato, 5,463,479, Cl. 358-518.000.
  - Matsuoka, Fumitomo; and Ikeda, Naoki, 5,462,893, Cl. 437-195.000.
  - Ogura, Tsuneo; Watanabe, Kiminori; Nakagawa, Akio; Yamaguchi, Yoshihiro; Yasuhara, Norio; Matsudai, Tomoko; Hasegawa, Shigeru; and Nakayama, Kazuya, 5,463,231, Cl. 257-138.000.
  - Oowaki, Yukihito; and Hasegawa, Takehiro, 5,463,577, Cl. 365-63.000.
  - Tanaka, Nobuhiko; Narabayashi, Tadashi; Miyano, Hiroshi; Takahashi, Hideaki; Yamada, Katsumi; and Yasuda, Makoto, 5,462,229, Cl. 239-397.500.
  - Toriumi, Akira; Shigyo, Naoyuki; Wada, Tetsunori; Tanimoto, Hiroyoshi; Ohuchi, Kazuya; and Yoshimi, Makoto, 5,463,234, Cl. 257-296.000.
  - Wada, Ichiro, 5,461,771, Cl. 29-602.100.
  - Watanabe, Yuji, 5,463,590, Cl. 365-230.030.
  - Yamashita, Hirofumi; Inoue, Ikuko; Sasaki, Michio; and Miyagawa, Ryohei, 5,463,232, Cl. 257-223.000.
  - Yano, Keiichi; Takahashi, Takashi; Kimura, Kazuo; Sato, Yoshitoshi; Yamakawa, Kouji; Yamamoto, Toshishige; Fujii, Masafumi; Hashimoto, Shizuki; and Takamichi, Hiroshi, 5,463,248, Cl. 257-677.000.
- Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See—*
  - Nakano, Tsutomu; and Nakane, Katsumi, 5,463,557, Cl. 364-470.000.
  - Shimizu, Izuru; Yoshida, Tetsuo; Iguchi, Masao; and Fukanuma, Tetsuhiko, 5,462,418, Cl. 418-55.300.
- Kadokura, Masaki: *See—*
  - Minami, Takanori; Shiraishi, Noriaki; Shimizu, Tsutomu; Takamuku, Kenji; Tsushio, Yoshinori; Mizushima, Yoshio; Yoshimoto, Kazuyuki; and Kadokura, Masaki, 5,462,021, Cl. 123-3.000.
- Kadoma, Yoshihito: *See—*
  - Miyazaki, Tsuyoshi; Sanchika, Kouzoh; Nishida, Mitsuhiro; Yasukohchi, Tohru; Kitano, Shigeru; Suginaka, Akinori; and Kadoma, Yoshihito, 5,463,066, Cl. 548-112.000.
- Kadota, Yoichi, to Mitsubishi Denki Kabushiki Kaisha. Intensive self-diagnosing system for engine exhaust gas control components and systems. 5,462,034, Cl. 123-520.000.
- Kadowaki, Minoru: *See—*
  - Matsuki, Sadao; Motogi, Moriyuki; Nabeshima, Keitaro; and Kadowaki, Minoru, 5,462,790, Cl. 428-229.000.
- Kaeriyama, Minoru: *See—*
  - Sato, Takehiro; Kinosita, Kimiaki; Kaeriyama, Minoru; and Hidaka, Tomoya, 5,463,133, Cl. 568-33.000.
- Kaga, Yosimitu: *See—*
  - Nitta, Tomio; Mifune, Hideo; Seki, Masato; Kaga, Yosimitu; and Serizawa, Noriyuki, 5,462,044, Cl. 126-262.000.
- Kagaya, Shinichiro, to Kabushiki Kaisha Toshiba. X-ray diagnosis apparatus. 5,463,668, Cl. 378-98.200.
- Kage, Kouzou, to NEC Corporation. Personal mobile communications system having central station for paging mobile users via base stations. 5,463,672, Cl. 379-59.000.
- Kageyama, Hidehei; Anzai, Shouji; and Mitsuya, Yoshihide, to Kotobuki & Co., Ltd. Mechanical pencil with improved slider mechanism. 5,462,376, Cl. 401-65.000.
- Kahl, Steven D.: *See—*
  - Campbell, Kevin P.; Knudson, C. Michael; Kahl, Steven D.; Louis, Charles F.; and Mickelson, James R., 5,462,857, Cl. 435-7.210.
- Kahn, Philip. Miniature pan/tilt tracking mount. 5,463,432, Cl. 352-243.000.
- Kai, Manabu, to Yamaha Hatsudoki Kabushiki Kaisha. Air-to-fuel ratio control unit for internal combustion engine. 5,462,031, Cl. 123-478.000.
- Kai, Osamu; Muroi, Junichi; Suzuki, Nobuo; Takagi, Tatsumi; Sakata, Shigekazu; and Oikawa, Hideyuki, to Tamura Electrics Works, Ltd.; and Kokusai Denshin Denwa Co., Ltd. Public telephone system. 5,463,679, Cl. 379-145.000.
- Kai, Tadao: *See—*
  - Tanaka, Etsuo; Kai, Tadao; Okano, Hiroshi; Katayama, Akira; and Imura, Yoshio, 5,463,443, Cl. 354-430.000.
- Kaiser, Richard A. Double curved backing plate with cushioned support for rotary buffing pads. 5,461,750, Cl. 15-230,000.
- Kajander, Richard E. Method of forming a fibrous mat. 5,462,642, Cl. 162-116.000.
- Kajimoto, Takeshi: *See—*
  - Shinbo, Yutaka; Kajimoto, Takeshi; Kobayashi, Mitsuteru; and Sato, Katsuyuki, 5,463,249, Cl. 257-690.000.
- Kakehi, Gen: *See—*
  - Ryu, Tadamitsu; Kakehi, Gen; and Aoe, Shigeru, 5,463,381, Cl. 340-825.150.
- Kakizaki, Akemi, to NEC Corporation. Mobile communication method and mobile communication system for deleting fill code in radio circuit. 5,463,477, Cl. 358-431.000.
- Kakuta, Hitoshi; Kamo, Yoshihisa; and Takamoto, Yoshifumi, to Hitachi, Ltd. Disk array system, data writing method thereof, and fault recovering method. 5,463,765, Cl. 395-182.040.
- Kalata, Gregory S.: *See—*
  - Perusek, Robert V.; Koch, Ulrich H.; and Kalata, Gregory S., 5,462,081, Cl. 137-498.000.
- Kälin, Xavier: *See—*
  - Luthi, Simon; Kälin, Xavier; Scholz, Wolfgang; and Stüssi, Edgar, 5,461,800, Cl. 36-28.000.
- Kalter, Howard L.: *See—*
  - Divakaruni, Sridhar; Dreibelbis, Jeffrey H.; Ellis, Wayne F.; Furman, Anatol; and Kalter, Howard L., 5,463,335, Cl. 327-143.000.
- Kamata, Susumu: *See—*
  - Haga, Nobuhiro; Inagaki, Masanao; Matsumoto, Saichi; and Kamata, Susumu, 5,463,052, Cl. 544-2.000.
- Kamax-Werke Rudolf Kellerman GmbH & Co. KG: *See—*
  - Damm, Klaus; Mages, Walter J.; and Sommer, Wolfgang, 5,462,395, Cl. 411-107.000.
- Kametani, Hiroshi: *See—*
  - Sugiyama, Shunichi; Kametani, Hiroshi; Yoshikoshi, Hideyuki; Ikeda, Nobuaki; and Hara, Tomihiro, 5,462,686, Cl. 252-62.620.
- Kaminkow, Joseph E. Moveable arm and inserts for amusement device. 5,462,276, Cl. 273-108.000.

Kamio, Shigeru; Hara, Mitsuo; and Tasaka, Hitoshi, to Nippondenso Co., Ltd. Apparatus for detecting reference position of servo-controlled member. 5,463,298, Cl. 318-599.000.

Kamitubo, Kouichi: *See—*
Nagano, Saburou; Tateno, Shuichi; Kamitubo, Kouichi; Tajima, Kenichi; and Nakanishi, Masahito, 5,462,813, Cl. 428-698.000.

Kamiya, Masaaki: *See—*
Takahashi, Kunihiro; Kamiya, Masaaki; Kojima, Yoshikazu; and Takasu, Hiroaki, 5,463,238, Cl. 257-351.000.

Kamiyama, Shiro; Kosugi, Masanori; Kurata, Masahiro; Shiraishi, Sadao; and Sasaki, Nobuyoshi, to Honda Giken Kogyo Kabushiki Kaisha; and Sky Aluminium Co., Ltd. Surface-treated aluminum material and method for its surface treatment. 5,462,634, Cl. 216-85.000.

Kammermeier, Bernhard: *See—*
Jacobi, Detlef; Jendralla, Heiner; and Kammermeier, Bernhard, 5,463,124, Cl. 564-155.000.

Kamo, Tomoichi: *See—*
Doi, Toshiya; Ozawa, Takeshi; Tanaka, Kazuhide; Yuasa, Toyotaka; Kamo, Tomoichi; and Matsuda, Shinpei, 5,462,922, Cl. 505-785.000.

Kamo, Yoshihisa: *See—*
Kakuta, Hitoshi; Kamo, Yoshihisa; and Takamoto, Yoshifumi, 5,463,765, Cl. 395-182.040.

Kamyr Atkiebolag: *See—*
Bergvist, Anders; and Dahllof, Hakan, 5,462,641, Cl. 162-40.000.

Kan, Yoshio; Nakamura, Takeshi; and Akabane, Yukihiro, to NSK Ltd. Drive shaft for automotive vehicle water pump. 5,462,489, Cl. 464-179.000.

Kanagawa, Shuichi: *See—*
Saito, Noriaki; Morimoto, Takashi; Takebe, Kazuo; Shiomi, Yutaka; Naitoh, Shigeki; and Kanagawa, Shuichi, 5,462,997, Cl. 525-507.000.

Kanamori, Takeo: *See—*
Furukawa, Hiroki; Tagawa, Junichi; Kanamori, Takeo; and Ibaraki, Satoru, 5,463,618, Cl. 370-32.100.

Kanatani, Keiichi: *See—*
Kanayama, Hideyuki; Amano, Ryuhei; Yamauchi, Kenji; and Kanatani, Keiichi, 5,463,434, Cl. 353-94.000.

Kanayama, Hideyuki; Amano, Ryuhei; Yamauchi, Kenji; and Kanatani, Keiichi, to Sanyo Electric Co., Ltd. Video projector with a plurality of projection devices. 5,463,434, Cl. 353-94.000.

Kanayama, Shinji; Kabeshita, Akira; Nishino, Kenichi; Ohnakada, Satoshi; Murata, Takahiko; Kimura, Kazuhiro; and Nishida, Kazuto, to Matsushita Electric Industrial Co., Ltd. Method of bonding an external lead and a tool therefor. 5,462,626, Cl. 156-272.800.

Kanayama, Toshiji: *See—*
Iwase, Norimichi; Morinaka, Yasuhiro; Tamao, Yoshikuni; Kanayama, Toshiji; and Yamada, Kumi, 5,462,941, Cl. 514-248.000.

Kane, James; Martin, Roy; and Schilling, Anne, to Optical Sensors Incorporated. Ratiometric fluorescence method to measure oxygen. 5,462,880, Cl. 436-138.000.

Kaneko, Michihiro: *See—*
Nishida, Junichi; Araki, Morio; Arakawa, Takeharu; Ishida, Tessho; Ayukai, Yasushiro; Baba, Toshiharu; Sakaguchi, Masahiko; Nobe, Kenichi; Kaneko, Michihiro; and Shinohara, Jun, 5,463,605, Cl. 369-58.000.

Kaneko, Nobuyuki; and Katsuhara, Wataru, to Olympus Optical Co., Ltd. Optical information reading and reproducing apparatus using pseudo DC-free codes. 5,463,606, Cl. 369-59.000.

Kaneko, Yoshio: *See—*
Kubota, Naoki; Kinoshita, Osamu; and Kaneko, Yoshio, 5,462,629, Cl. 156-345.000.

Kanemori, Yuzuru: *See—*
Negoto, Hidenori; Katayama, Mikio; Nakazawa, Kiyoshi; Kato, Hiroaki; Kanemori, Yuzuru; and Nagayasu, Takayoshi, 5,463,230, Cl. 257-66.000.

Kang, Kwang S., to Samsung Electronics Co., Ltd. Weight sensing apparatus of a microwave oven having a turntable. 5,463,207, Cl. 219-708.000.

Kaniwa, Kouji; Nishijima, Hideo; Fujita, Kouji; and Nishimura, Keizo, to Hitachi, Ltd. Helical-scan information recording-playback apparatus. 5,463,505, Cl. 360-73.040.

Kanjo, Wajih: *See—*
Daugherty, David W., Jr.; Kanjo, Wajih; and Hawryszkow, Michael G., 5,462,179, Cl. 213-62.00R.

Kanne, Reinhard: *See—*
Springer, Wolfgang; Rast, Hans G.; Löbberding, Antonius; and Kanne, Reinhard, 5,462,855, Cl. 435-6.000.

Kanno, Makoto: *See—*
Inaba, Shigeru; Fukuhara, Masaaki; Hirota, Makoto; Yamamoto, Mitsuo; Abe, Jun; Miyata, Hideaki; Sunaga, Takayuki; Ishikawa, Toru; Shiina, Yoshio; Isosu, Toru; and Kanno, Makoto, 5,463,452, Cl. 355-246.000.

Kano, Daijiro: *See—*
Yuhta, Toshio; Nishimura, Ikuya; Kano, Daijiro; Saitou, Tsuyoshi; Suzuki, Tomita; and Tanaka, Mamoru, 5,462,362, Cl. 384-13.000.

Kanschik-Conradsen, Andreas; and Papenfuhs, Theodor, to Hoechst Aktiengesellschaft. Fluorinated benzils and a process for their preparation. 5,463,135, Cl. 568-331.000.

Kanschik-Conradsen, Andreas: *See—*
Papenfuhs, Theodor; Kanschik-Conradsen, Andreas; and Pressler, Wilfried, 5,463,148, Cl. 568-938.000.

Kantner, Robert F., Jr.; Iverson, Vaughn S.; Morse, Kenneth; Pietras, Mark A.; and Rodriguez, Arturo A., to International Business Machines Corporation. System and method for pattern-matching with error control for image and video compression. 5,463,701, Cl. 382-166.000.

Kanzaki Kokyukoki Mfg. Co., Ltd.: *See—*
Azuma, Toshiro; Seno, Yasuo; Kitagawara, Hiroshi; and Nemoto, Shusuke, 5,462,148, Cl. 192-48.300.

Kao Corporation: *See—*
Hayashi, Masaharu, 5,462,967, Cl. 514-547.000.
Hioki, Yuichi; Kurita, Kazuhiko; Kawabata, Keiko; and Azuma, Toshikazu, 5,462,912, Cl. 504-116.000.
Okada, Jouji; Kawamata, Akira; Tokunaga, Tadayuki; Torizuka, Makoto; and Asahi, Masahiko, 5,463,009, Cl. 528-15.000.
Yasuda, Shin-ichiro; Kawabe, Kuniyasu; and Sasaki, Mitsuhiro, 5,463,454, Cl. 355-290.000.

Kao, Rom-Shen: *See—*
Gibbs, Vickie L.; and Kao, Rom-Shen, 5,463,642, Cl. 371-40.100.

Kaplan, Donald S.; Hermes, Matthew E.; Muth, Ross R.; Brown, David L.; and Holzwarth, Henry A., to United States Surgical Corporation. Packaged synthetic absorbable surgical elements. 5,462,162, Cl. 206-339.000.

Kaplan, Jerome I. Dental X-ray alignment system. 5,463,669, Cl. 378-205.000.

Karandikar, B. M.; Bui, Loc V.; and Le, Huc P., to Tektronix, Inc. Hyper-thermogelling aqueous phase change inks and methods for using them in an ink jet printer. 5,462,591, Cl. 106-20.00R.

Karasawa, Shinji, to Miyagi National College of Technology. Electronic multiple-valued register. 5,463,341, Cl. 327-219.000.

Kardontchik, Jaime E.: *See—*
Petersen, Corey D.; Hiser, Douglas L.; and Kardontchik, Jaime E., 5,463,349, Cl. 330-254.000.

Karl Mayer Textilmashinenfabrik GmbH: *See—*
Handel, Ulrich; and Kirchner, Joachim, 5,461,881, Cl. 66-210.000.

Karlsson, Lars G.: *See—*
Diec, Stephanie; and Karlsson, Lars G., 5,463,731, Cl. 395-161.000.

Kasa, Hideki: *See—*
Goto, Yuichiro; Kasa, Hideki; and Harada, Takatomo, 5,462,314, Cl. 285-21.000.

Kasai, Junichi: *See—*
Waki, Masaki; Kasai, Junichi; Aoki, Tsuyoshi; Honda, Toshiyuki; and Sato, Hirotaka, 5,463,253, Cl. 257-724.000.

Kashida, Motokazu; and Yamashita, Shinichi, to Canon Kabushiki Kaisha. Signal processing device. 5,463,392, Cl. 341-110.000.

Kashihara, Atsushi: *See—*
Yamada, Hiromichi; Ohkubo, Masaharu; Ojima, Masaki; Sasame, Hiroshi; Kawana, Takashi; Seto, Kaoru; Mano, Hiroshi; Saito, Tetsuo; Kashihara, Atsushi; and Ito, Michio, 5,463,473, Cl. 358-300.000.

Kashima, Toshihiro; Hoshino, Masayuki; Nakano, Masachika; and Hirano, Tokushiro, to Toyo Boseki Kabushiki Kaisha; and Toshiba Corporation. Fiber-reinforced plastic material comprising stacked woven fabrics of differential weave in a plastic matrix. 5,462,791, Cl. 428-259.000.

Kason Industries, Inc.: *See—*
Lehton, Eino M.; and Finkelstein, Burl, 5,461,829, Cl. 49-409.000.

Kaspar, Ernst, to EC Engineering + Consulting Spezialmaschinen GmbH. Rotary passage. 5,462,083, Cl. 137-580.000.

Kastingschafer, Gerhard; Auf dem Venne, Johannes; Pingel, Herbert; Giesemann, Reinhard; Peterwerth, Bernhard; Gerhardt, Klaus; and Gebbe, Reinhold, to Krupp Polysius AG. Tiltable supporting roller bearing. 5,462,370, Cl. 384-549.000.

Katagiri, Naoki: *See—*
Nohmi, Yasuhiro; Yamaguchi, Tadashi; Matsuzawa, Kimio; Katagiri, Naoki; and Sakaguchi, Hotaka, 5,463,188, Cl. 174-108.000.

Kataura, Koichi: *See—*
Niimi, Masahiro; Hariu, Yukari; Kataura, Koichi; Ishii, Yoshibumi; and Kato, Kazuaki, 5,462,864, Cl. 435-100.000.

Katayama, Akira: *See—*
Tanaka, Etsuo; Kai, Tadao; Okano, Hiroshi; Katayama, Akira; and Imura, Yoshio, 5,463,443, Cl. 354-430.000.

Katayama, Mikio: *See—*
Negoto, Hidenori; Katayama, Mikio; Nakazawa, Kiyoshi; Kato, Hiroaki; Kanemori, Yuzuru; and Nagayasu, Takayoshi, 5,463,230, Cl. 257-66.000.

Katdare, Ashok V.: *See—*
Brenner, Gerald S.; Katdare, Ashok V.; Pretzer, Denise; and Whiteford, Donna T., 5,462,932, Cl. 514-108.000.

Kato, Akira: *See—*
Niimura, Koichi; Ikeda, Yuko; Kato, Akira; and Ando, Takao, 5,462,957, Cl. 514-397.000.

Kato, Hiroaki: *See—*
Negoto, Hidenori; Katayama, Mikio; Nakazawa, Kiyoshi; Kato, Hiroaki; Kanemori, Yuzuru; and Nagayasu, Takayoshi, 5,463,230, Cl. 257-66.000.

Kato, Junichi: *See—*
Uchiyama, Seiji; Noguchi, Akio; Ushio, Yukihide; Matsuo, Shinpei; Serizawa, Youji; Takeuchi, Makoto; Yamada, Kazurou; and Kato, Junichi, 5,463,410, Cl. 347-133.000.

Kato, Kazuaki: *See—*
Niimi, Masahiro; Hariu, Yukari; Kataura, Koichi; Ishii, Yoshibumi; and Kato, Kazuaki, 5,462,864, Cl. 435-100.000.

Kato, Masao: *See—*
Oyama, Takamasa; Kato, Masao; and Miwa, Michio, 5,463,568, Cl. 364-561.000.

Kato, Shigeo: *See—*
Yamazaki, Hiraku; Sugai, Teruo; Kato, Shigeo; Tazoe, Haruo; Hotate, Shiroh; and Goto, Iwao, 5,462,800, Cl. 428-408.000.

Kato, Takaaki, to Nissin Kohki Co., Ltd. Optical mouse and resin lens unit. 5,463,387, Cl. 341-31.000.

Kato, Takashi; and Ikeda, Tadashi, to Fuji Photo Film Co., Ltd. Silver halide photographic material. 5,462,851, Cl. 430-584.000.

Kato, Yonosuke: *See—*

Kiyose, Atsunobu; and Kato, Yonosuke, 5,463,037, Cl. 536-90.000.

Kato, Yumiko; Jaskie, James E.; and Wiemann, David A., to Motorola. Dimpled image display faceplate for receiving multiple discrete phosphore droplets and having conformal metallization disposed thereon. 5,463,273, Cl. 313-461.000.

Katoh, Hisashi; Nakajima, Tadayoshi; Hata, Tsunehisa; Miyano, Hideyo; and Koda, Shinsuke, to Honda Giken Kogyo Kabushiki Kaisha. Process for casting a cylinder block. 5,462,108, Cl. 164-98.000.

Katopodis, Nonda. Method for determining lipid bound sialic acid in plasma or serum. 5,462,877, Cl. 436-93.000.

Katsuhara, Wataru: *See—*

Kaneko, Nobuyuki; and Katsuhara, Wataru, 5,463,606, Cl. 369-59.000.

Katsukawa, Masato: *See—*

Tanaka, Masashi; Fukami, Toshiyuki; Katsukawa, Masato; and Nakamori, Hideo, 5,462,825, Cl. 430-58.000.

Kaufer, Daniel M.: *See—*

Portelli, Gene B.; Schultz, William J.; Boden, John T.; and Kaufer, Daniel M., 5,462,996, Cl. 525-423.000.

Kaul, Ashok: *See—*

Minick, Steven E.; Lawless, Michael W.; Soberon, Peter A.; Kaul, Ashok; and Hermann, Robert A., 5,462,256, Cl. 251-331.000.

Kawabata, Keiko: *See—*

Hioki, Yuichi; Kurita, Kazuhiko; Kawabata, Keiko; and Azuma, Toshikazu, 5,462,912, Cl. 504-116.000.

Kawabe, Kuniyasu: *See—*

Yasuda, Shin-ichiro; Kawabe, Kuniyasu; and Sasaki, Mitsuhiro, 5,463,454, Cl. 355-290.000.

Kawabe, Manabu: *See—*

Fukasawa, Atsushi; Kawabe, Manabu; Kawahashi, Akiyoshi; and Sato, Takuro, 5,463,660, Cl. 375-205.000.

Kawabe, Ryu. Method and apparatus for controlling the flow of fluids. 5,462,251, Cl. 251-4.000.

Kawada, Sunao; Inagi, Masataka; Iwamura, Yoshio; Itoh, Toyotsugu; and Hashimoto, Takayoshi, to Konica Corporation. Method for producing a polygon mirror. 5,463,503, Cl. 359-838.000.

Kawaguchi, Takeo, to Mitsubishi Denki Kabushiki Kaisha. Method of manufacturing coils for use in charged particle deflecting electromagnet. 5,461,773, Cl. 29-605.000.

Kawaguchi, Yoshihisa: *See—*

Yamamoto, Taizo; Konishi, Hirokazu; Kawaguchi, Yoshihisa; and Nagao, Akira, 5,463,465, Cl. 356-394.000.

Kawahashi, Akiyoshi: *See—*

Fukasawa, Atsushi; Kawabe, Manabu; Kawahashi, Akiyoshi; and Sato, Takuro, 5,463,660, Cl. 375-205.000.

Kawai, Jun: *See—*

Fukuoka, Akira; Kawai, Jun; and Tagami, Satoru, 5,463,266, Cl. 310-359.000.

Kawai, Kiyoshi: *See—*

Miyoshi, Yoshihiro; Shiraishi, Hiroyuki; Kawai, Kiyoshi; and Koga, Hideaki, 5,463,000, Cl. 526-119.000.

Kawakami, Katsuhiro: *See—*

Hayakawa, Isao; Atarashi, Shohgo; Kimura, Yoichi; and Kawakami, Katsuhiro, 5,463,053, Cl. 544-101.000.

Kawakami, Kazuo: *See—*

Oki, Tetsuro; Harada, Koichiro; Neki, Ryuichi; Kawakami, Kazuo; Miyata, Tsuyoshi; and Matsuo, Kozo, 5,462,900, Cl. 437-249.000.

Kawamata, Akira: *See—*

Okada, Jouji; Kawamata, Akira; Tokunaga, Tadayuki; Torizuka, Makoto; and Asahi, Masahiko, 5,463,009, Cl. 528-15.000.

Kawamoto, Fumio; Sakaino, Yoshiki; and Yoshida, Shohei, to Fuji Photo Film Co., Ltd. Silver halide photographic material. 5,462,824, Cl. 430-501.000.

Kawamura, Kiyoshi, to Yamaha Corporation. Keyboard instrument having a catcher stopper for silent operation on keyboard. 5,463,184, Cl. 84-719.000.

Kawamura, Shingo: *See—*

Yamada, Minoru; and Kawamura, Shingo, 5,462,775, Cl. 427-573.000.

Kawana, Takashi: *See—*

Yamada, Hiromichi; Ohkubo, Masaharu; Ojima, Masaki; Sasame, Hiroshi; Kawana, Takashi; Seto, Kaoru; Mano, Hiroshi; Saito, Tetsuo; Kashihara, Atsushi; and Ito, Michio, 5,463,473, Cl. 358-300.000.

Kawano, Mitsumo, to Kabushiki Kaisha Toshiba. Variable voltage to current conversion circuit. 5,463,309, Cl. 323-315.000.

Kawasaki, Hiroaki; Sakurada, Hiroshi; Narushima, Shinichi; Iwasa, Tadashi; and Yamaguchi, Hiroshi, to Futaba Corporation. Double-faced vacuum fluorescent display. 5,463,276, Cl. 313-496.000.

Kawasaki, Somei; and Iseki, Masami, to Canon Kabushiki Kaisha. Input circuit for level-shifting TTL or CMOS to ECL signals. 5,463,329, Cl. 326-77.000.

Kawasaki Steel Corp.: *See—*

Kubota, Naoki; Kinoshita, Osamu; and Kaneko, Yoshio, 5,462,629, Cl. 156-345.000.

Ogura, Kuniaki; Ishikawa, Hiroyuki; Maeda, Yoshiaki; and Komamura, Kouichi, 5,462,577, Cl. 75-345.000.

Kawashima, Makoto; Nagano, Kazuhiro; Hori, Kazuyoshi; Ishikawa, Hiroaki; and Morishita, Masataka, to Asahi Kasei Kogyo Kabushiki Kaisha. Treatment of psoriasis by administration of 4-carbamoyl-1-β-D-ribofuranosylimidszolium-5-oleate. 5,462,929, Cl. 514-43.000.

Kawashima, Masahiro, to Matsushita Electric Industrial Co., Ltd. Dynamic focusing device for cathode ray tube. 5,463,427, Cl. 348-806.000.

Kawauchi, Nobuya: *See—*

Fukazawa, Nobuyuki; Suzuki, Tsuneji; Kawauchi, Nobuya; Komatsu, Hironori; Otsuka, Kengo; and Nakajima, Yuki, 5,463,061, Cl. 546-158.000.

Kaya, Tomoki: *See—*

Sasou, Hiroshi; Kaya, Tomoki; Watanabe, Tosiaki; and Fukaya, Shinji, 5,463,208, Cl. 235-380.000.

Kayamori, Satoshi: *See—*

Takei, Toshiaki; Kayamori, Satoshi; and Ota, Hiroyuki, 5,462,985, Cl. 524-204.000.

Kazama, Masakazu: *See—*

Iwatani, Hidetoshi; Fujino, Masato; Matsumoto, Shinji; Fujii, Choichiro; and Kazama, Masakazu, 5,463,365, Cl. 336-98.000.

Keenan, Michael J.: *See—*

Hendriksen, Dan E.; McGlamery, Gerald G.; Keenan, Michael J.; and Pete, Derrick D., 5,463,157, Cl. 585-511.000.

Keeney, Harold M.; Van Anglen, Erik S.; and Forand, James L., to Electroplating Technologies, Inc. Method and apparatus for electrolytic plating. 5,462,649, Cl. 205-93.000.

Kehr, Clifton L.: *See—*

Braatz, James A.; Kehr, Clifton L.; Grasel, Timothy G.; and Letter, William S., 5,462,536, Cl. 604-304.000.

Keith, Arlie L. Charging batteries of electric vehicles. 5,462,439, Cl. 439-34.000.

Keller, Hansjoerg; Rao, Sathyanarayana; and Schuerch, Heinz-Christoph, to Ascom Tech AG. Control unit for the common memory of an ATM node. 5,463,622, Cl. 370-60.100.

Keller, Harald; Jaeger, Ulrich; Steininger, Helmut; Kopke, Helmut; Schomann, Klaus D.; and Schildberg, Hans-Peter, to BASF Magnetics GmbH. Magnetic recording medium. 5,462,810, Cl. 428-694.00T.

Keller, James A.: *See—*

Lesko, Jon M.; Brown, Larry L.; and Keller, James A., 5,463,222, Cl. 250-330.000.

Keller, John H.: *See—*

Barnes, Michael S.; Keller, John H.; Logan, Joseph S.; Tompkins, Robert E.; and Westerfield, Robert P., Jr., 5,463,525, Cl. 361-234.000.

Keller, Wilhelm A. Pluggable multiple cartridge. 5,462,205, Cl. 222-145.100.

Keller, Wilhelm A. Adapter for a mixing or dispensing device. 5,462,317, Cl. 285-177.000.

Kelley, Andrew T., to Cutco Cutlery Corporation. Knife sharpener. 5,461,942, Cl. 73-87.000.

Kelley, Mark A.: *See—*

Sullivan, Dennis J.; Butler, Aaron S.; and Kelley, Mark A., 5,461,866, Cl. 60 757.000.

Kembo, Yukio: *See—*

Morioka, Hiroshi; Noguchi, Minori; Ohshima, Yoshimasa; Kembo, Yukio; Nishiyama, Hidetoshi; Matsuoka, Kazuhiko; and Shigyo, Yoshiharu, 5,463,459, Cl. 356-237.000.

Kendall Company, The: *See—*

Richards, Mildred C., 5,462,780, Cl. 428-35.800.

Kendrick, Alan D.: *See—*

Kida, Jeffrey T.; and Kendrick, Alan D., 5,462,448, Cl. 439-357.000.

Kennedy, Brian H., to National Optronics, Inc. Blocking system for prescription lenses. 5,462,475, Cl. 451-384.000.

Kepley, Walter R., III; Greer, Dana J.; and Shields, Richard A., Jr., to Claircom Communications Group, Inc. Credit card reader. 5,463,678, Cl. 379-91.000.

Kernforschungszentrum Karlsruhe GmbH: *See—*

Stark, Walter; and Ruprecht, Robert, 5,462,640, Cl. 216-103.000.

Kessel, Carl R.: *See—*

Calhoun, Clyde D.; and Kessel, Carl R., 5,462,765, Cl. 427-198.000.

Ketels, Gerardus H. J., to Stork Protecon B.V. Method and device for deboning leg pieces of slaughtered animals. 5,462,477, Cl. 452-135.000.

Kettl, Ludwig: *See—*

Krebs, Stefan; Kettl, Ludwig; and Cianciara, Wojciech, 5,462,040, Cl. 123-688.000.

Kettle, Richard L.: *See—*

Baker, Andrew R.; and Kettle, Richard L., 5,462,573, Cl. 75-231.000.

Kettner, Charles A.: *See—*

Fevig, John M.; Abelman, Matthew M.; Amparo, Eugene C.; Cacciola, Joseph; Kettner, Charles A.; Pacofsky, Gregory J.; and Wang, Chia-Lin, 5,462,964, Cl. 514-423.000.

Khinkis, Mark J., to Institute of Gas Technology. Process and apparatus for cyclonic combustion. 5,462,430, Cl. 431-10.000.

Khormaei, Iranpour, to Planar Systems, Inc. Active matrix electroluminescent cell design. 5,463,279, Cl. 315-169.300.

Kida, Jeffrey T.; and Kendrick, Alan D., to Morton International, Inc. Electrical connector locking system. 5,462,448, Cl. 439-357.000.

Kiefer, Garry E.; and Kim, Won D., to Dow Chemical Company, The. 2-pyridylmethylenepolyazamacrocyclophosphonic acids, complexes and derivatives thereof, for use as contrast agents. 5,462,725, Cl. 424-9.363.

Kiesewetter, René: *See—*

Kniewske, Reinhard; Kiesewetter, René; Reinhardt, Eugen; and Szablikowski, Klaus, 5,463,036, Cl. 536-86.000.

Kiester, P. Douglas. Bone cement removal and apparatus. 5,462,552, Cl. 606-92.000.

Kihlberg, Reinhold; Lindgren, Svante B.; and Sandberg, Lars G., to Pharmacia Aktiebolag. Product containing growth factor and glutamine and use of growth factor for the treatment of intestinal mucosa. 5,462,924, Cl. 574-12.000.

Kijimuta, Hitoshi: *See—*

  Suzuki, Shinichi; and Kijimuta, Hitoshi, 5,463,178, Cl. 428-216.000.

Kikuchi, Makoto: *See—*

  Nishi, Takashi; Matsuda, Masami; Noshita, Kenji; Kikuchi, Makoto; Izumida, Tatsuo; Tamata, Shin; and Kiuchi, Yoshimasa, 5,463,171, Cl. 588-4.000.

Kilian & Co. GmbH: *See—*

  Kramer, Hans, 5,462,427, Cl. 425-231.000.

Kim, Jin K. Gas lighter with ignition safety device. 5,462,432, Cl. 431-153.000.

Kim, Jin-Up; and Kim, Sun-Young, to Electronics and Telecommunications Research Institute. Multi-nary OR logic device. 5,463,571, Cl. 364-746.200.

Kim, Jin-Up; and Kim, Sun-Young, to Electronics and Telecommunications Research Institute. Multi-nary and logic device. 5,463,572, Cl. 364-746.200.

Kim, John Y., to Metapro. Frontal sole exercise device. 5,461,799, Cl. 36-7.200.

Kim, Jung C.; Oh, Dong Y.; Choe, Gyu S.; Hong, Kyung S.; Kim, Kyung H.; Lee, Joo H.; Lee, Ha I.; Park, Kyeong B.; Gil, Dong S.; Kwon, Oh H.; and Kwon, Byoung H., to Goldstar Co., Ltd. Low frequency vibration type washing machine having shrinkable shielding means for preventing clothes from jamming. 5,461,886, Cl. 68-3.0SS.

Kim, Jung G., to Samsung Aerospace Industries, Ltd. Vector controlling method and apparatus for induction motor. 5,463,301, Cl. 318-801.000.

Kim, Jungtae, to Daewoo Electronics Co., Ltd. Loading apparatus of a multi-disc player. 5,463,611, Cl. 369-191.000.

Kim, Kyung H.: *See—*

  Kim, Jung C.; Oh, Dong Y.; Choe, Gyu S.; Hong, Kyung S.; Kim, Kyung H.; Lee, Joo H.; Lee, Ha I.; Park, Kyeong B.; Gil, Dong S.; Kwon, Oh H.; and Kwon, Byoung H., 5,461,886, Cl. 68-3.0SS.

Kim, Sun-Young: *See—*

  Kim, Jin-Up; and Kim, Sun-Young, 5,463,571, Cl. 364-746.200.

  Kim, Jin-Up; and Kim, Sun-Young, 5,463,572, Cl. 364-746.200.

Kim, Won D.: *See—*

  Kiefer, Garry E.; and Kim, Won D., 5,462,725, Cl. 424-9.363.

Kim, Won S.: *See—*

  Kim, Yong Z.; Oh, Hun S.; Yeo, Jae H.; Lim, Jong C.; Bang, Chan S.; Kim, Won S.; and Yim, Hyeon J., 5,462,935, Cl. 514-206.000.

Kim, Yong Z.; Oh, Hun S.; Yeo, Jae H.; Lim, Jong C.; Bang, Chan S.; Kim, Won S.; and Yim, Hyeon J., to Lucky Limited. Cephalosporin compounds. 5,462,935, Cl. 514-206.000.

Kimberly-Clark Corporation: *See—*

  Bruemmer, Mary A.; Rosch, Paulette M.; Vukos, John P.; Uitenbroek, Duane G.; Zehner, Georgia L.; and Rasmussen, Christine A., 5,462,541, Cl. 604-391.000.

  Carr, James M.; and Harke, Elwood W., 5,462,537, Cl. 604-368.000.

Kimmel, Ronald C., to RJJB & G, Inc. Treatment of nutrient-rich water. 5,462,666, Cl. 210-602.000.

Kimura, Hiroshi; Miyazawa, Shoichi; Horita, Ryutaro; Hase, Kenichi; Hirano, Akihiko; and Uragami, Akira, to Hitachi, Ltd. Magnetic disk system and waveform equalizer therefor. 5,463,504, Cl. 360-65.000.

Kimura Industry Co., Ltd.: *See—*

  Kimura, Motoyasu; and Kimura, Tomoe, 5,461,738, Cl. 5-604.000.

Kimura, Kazuhiro: *See—*

  Kanayama, Shinji; Kabeshita, Akira; Nishino, Kenichi; Ohnakada, Satoshi; Murata, Takahiko; Kimura, Kazuhiro; and Nishida, Kazuto, 5,462,626, Cl. 156-272.800.

Kimura, Kazuo: *See—*

  Yano, Keiichi; Takahashi, Takashi; Kimura, Kazuo; Sato, Yoshitoshi; Yamakawa, Kouji; Yamamoto, Toshishige; Fujii, Masafumi; Hashimoto, Shizuki; and Takamichi, Hiroshi, 5,463,248, Cl. 257-677.000.

Kimura, Mitsuteru; and Honma, Masato, to Ricoh Company, Ltd. Micro vacuum device. 5,463,277, Cl. 315-169.100.

Kimura, Motoyasu; and Kimura, Tomoe, to Kimura Industry Co., Ltd. Bed system with excreting mechanism. 5,461,738, Cl. 5-604.000.

Kimura, Scott A.: *See—*

  Simpson, Miles S.; Kimura, Scott A.; and Gibson, Steven L., 5,463,422, Cl. 348-390.000.

Kimura, Tomoaki; Nihei, Mitsuo; Horii, Kenji; and Yoshimoto, Kenichi, to Hitachi, Ltd. Method and apparatus for continuous casting and hot-rolling. 5,461,770, Cl. 29-527.700.

Kimura, Tomoe: *See—*

  Kimura, Motoyasu; and Kimura, Tomoe, 5,461,738, Cl. 5-604.000.

Kimura, Yoichi: *See—*

  Hayakawa, Isao; Atarashi, Shohgo; Kimura, Yoichi; and Kawakami, Katsuhiro, 5,463,053, Cl. 544-101.000.

King, Steven A.: *See—*

  Brodnax, Timothy B.; Bullis, Bryan K.; King, Steven A.; Kogge, Peter M.; and Rickard, Dale A., 5,463,746, Cl. 395-375.000.

Kingsley, Jack D.: *See—*

  Kwasnick, Robert F.; Wei, Ching-Yeu; and Kingsley, Jack D., 5,463,225, Cl. 250-370.110.

Kingsman, Alan J.; Kingsman, Susan M.; Adams, Sally E.; Mellor, Elizabeth J. C.; and Malim, Michael H., to British Biotech Pharmaceuticals Limited. Fusion proteins and particles. 5,463,024, Cl. 530-350.000.

Kingsman, Susan M.: *See—*

  Kingsman, Alan J.; Kingsman, Susan M.; Adams, Sally E.; Mellor, Elizabeth J. C.; and Malim, Michael H., 5,463,024, Cl. 530-350.000.

Kinkead, Devon A., to Extraction Systems, Inc. Controlling air quality. 5,462,485, Cl. 454-256.000.

Kinoshita, Hirotugu; Nomura, Souichi; and Mishima, Masaru, to Nippon Oil Co., Ltd. Grease composition for constant velocity joint. 5,462,683, Cl. 252-25.000.

Kinoshita, Hirotugu: *See—*

  Naka, Michiharu; Koizumi, Hideki; Takahashi, Yuzo; Kinoshita, Hirotugu; and Mishima, Masaru, 5,462,684, Cl. 252-51.50R.

Kinoshita, Masao: *See—*

  Watase, Yasushi; Kinoshita, Masao; Watanabe, Hiroyuki; Hashimoto, Takeo; Iida, Takehiro; and Washiyama, Hiroaki, 5,463,272, Cl. 313-373.000.

Kinoshita, Osamu: *See—*

  Kubota, Naoki; Kinoshita, Osamu; and Kaneko, Yoshio, 5,462,629, Cl. 156-345.000.

Kinoshita, Yasuo: *See—*

  Takito, Tetsuo; Inaba, Kazuki; Kinoshita, Yasuo; and Sasaki, Teruhiko, 5,462,650, Cl. 208-58.000.

Kinosita, Kimiaki: *See—*

  Sato, Takehiro; Kinosita, Kimiaki; Kaeriyama, Minoru; and Hidaka, Tomoya, 5,463,133, Cl. 568-33.000.

Kinugasa, Masayoshi: *See—*

  Doi, Yukio; Zhang, Wei-Zhong; Ishitani, Koichi; and Kinugasa, Masayoshi, 5,462,988, Cl. 524-501.000.

Kirchner, Joachim: *See—*

  Handel, Ulrich; and Kirchner, Joachim, 5,461,881, Cl. 66-210.000.

Kirino, Fumiyoshi; Saito, Atsushi; Toda, Tsuyoshi; Ide, Hiroshi; Tsuchinaga, Hiroyuki; Maeda, Takeshi; and Kugiya, Fumio, to Hitachi, Ltd. Magneto-optical recording system using recording waveform having a plurality of power levels providing high recording density. 5,463,600, Cl. 369-13.000.

Kirkpatrick, Paul A.; and Mehaffey, James D., to Ingersoll-Rand Company. Diagnostic apparatus for an electronic controller. 5,463,559, Cl. 364-483.000.

Kishore, Ganesh M.: *See—*

  Barry, Gerard F.; and Kishore, Ganesh M., 5,463,175, Cl. 800-205.000.

Kist, Joost; Rovers, Willem P. G.; and Vanden Berghe, Dirk A., to Futura Nova B.V. Cell collecting device. 5,462,063, Cl. 128-756.000.

Kitagawara, Hiroshi: *See—*

  Azuma, Toshiro; Seno, Yasuo; Kitagawara, Hiroshi; and Nemoto, Shusuke, 5,462,148, Cl. 192-48.300.

Kitaguchi, Masanori, to Sharp Kabushiki Kaisha. Tuner circuit having a switching diode to change receiving bands. 5,463,362, Cl. 334-47.000.

Kitaguchi, Yuko; and Ohta, Hiroshi, to Matsushita Electric Industrial Co., Ltd. Image generation device. 5,463,729, Cl. 395-161.000.

Kitahata, Sumio: *See—*

  Hara, Koji; Fujita, Koki; Kuwahara, Nobuhiro; Kitahata, Sumio; and Koizumi, Kyoko, 5,463,039, Cl. 536-124.000.

Kitamoto, Masahiro: *See—*

  Ishino, Tsutomu; and Kitamoto, Masahiro, 5,461,869, Cl. 62-6.000.

Kitamura, Toshiya: *See—*

  Onoue, Takashi; Araki, Kiyoshi; Ishida, Noriya; Kitamura, Toshiya; Niitsu, Yasuhiko; Yanagisawa, Makiko; Sakamoto, Ryo; and Sato, Fumihiro, 5,462,821, Cl. 429-218.000.

Kitani, Koji; and Nakanishi, Tohru, to Canon Kabushiki Kaisha. Vibration driven motor. 5,463,265, Cl. 310-323.000.

Kitano, Shigeru: *See—*

  Miyazaki, Tsuyoshi; Sanchika, Kouzoh; Nishida, Mitsuhiro; Yasukohchi, Tohru; Kitano, Shigeru; Suginaka, Akinori; and Kadoma, Yoshihito, 5,463,066, Cl. 548-112.000.

Kitayama, Tooru: *See—*

  Futami, Motoo; Endo, Tunehiro; Notohara, Yasuo; and Kitayama, Tooru, 5,463,299, Cl. 318-618.000.

Kittaka, Yoshiaki: *See—*

  Saito, Yoshihiro; and Kittaka, Yoshiaki, 5,463,756, Cl. 395-494.000.

Kiuchi, Yoshimasa: *See—*

  Nishi, Takashi; Matsuda, Masami; Noshita, Kenji; Kikuchi, Makoto; Izumida, Tatsuo; Tamata, Shin; and Kiuchi, Yoshimasa, 5,463,171, Cl. 588-4.000.

Kiyose, Atsunobu; and Kato, Yonosuke, to Daicel Chemical Industries, Ltd. Process for producing mixed cellulose ether. 5,463,037, Cl. 536-90.000.

Klaassen, Willem: *See—*

  Manusch, Cristoph; Obersteller, Udo; and Klaassen, Willem, 5,462,633, Cl. 156-577.000.

Klaus Herrmann Aktiengesellschaft: *See—*

  Kleinwächter, Jürgen; and Leibfried, Ulrich, 5,462,047, Cl. 126-639.000.

Klausener, Alexander: *See—*

  Buysch, Hans-Josef; Klausener, Alexander; Szablikowski, Klaus; Balser, Klaus; and Wilke, Michaela, 5,463,034, Cl. 536-17.200.

  Seitz, Thomas; Klausener, Alexander; Berg, Dieter; Wachendorff-Neumann, Ulrike; Erdelen, Christoph; Hänssler, Gerd; Brandes, Wilhelm; and Dutzmann, Stefan, 5,462,943, Cl. 514-256.000.

Klayman, Jeffrey T., to Motorola, Inc. Data compression method and device utilizing children arrays. 5,463,389, Cl. 341-51.000.

Klee, Werner; and Gisel, Thomas, to Maschinenfabrik Rieter AG. Method and apparatus for winding a yarn onto a bobbin tube. 5,462,239, Cl. 242-18.00R.

Kleindienst, Anke: *See—*

Sassmannshausen, Werner; Menzel, Karl-Heinz; Sassmannshausen, Werner; Schreiber, Stefan; Kleindienst, Anke; and Günther, Hubert, 5,461,959, Cl. 84-421.000.

Kleinwächter, Jürgen; and Leibfried, Ulrich, to Klaus Herrmann Aktiengesellschaft. Solar water-heater with integrated storage. 5,462,047, Cl. 126-639.000.

Klementich, Erich F., to Marubeni Tubulars, Inc. Stabilized center-shoulder-sealed tubular connection. 5,462,315, Cl. 285-24.000.

Klötzer, Sieghart; and Mücke, Bruno, to Agfa-Gevaert AG. Recording material for color photography. 5,462,843, Cl. 430-503.000.

Klun, Thomas P.: *See—*

Williams, Jerry W.; DeVoe, Robert J.; Klun, Thomas P.; Vesley, George F.; and Zimmerman, Patrick G., 5,462,797, Cl. 428-345.000.

KMS Fusion, Inc.: *See—*

Ladewski, Theodore B., 5,463,464, Cl. 356-376.000.

Knepler, John T., to Bunn-O-Matic Corporation. Calibrateable timed weight grinder. 5,462,236, Cl. 241-34.000.

KNF Neuberger GmbH: *See—*

Becker, Erich; and Riedlinger, Heinz, 5,461,966, Cl. 92-1.000.

Kniewske, Reinhard; Kiesewetter, René; Reinhardt, Eugen; and Szablikowski, Klaus, to Wolff Walsrode Aktiengesellschaft. Carboxymethylcellulose and its use in textile printing. 5,463,036, Cl. 536-86.000.

KNIPEX-Werk C. Gustav Putsch: *See—*

Putsch, Ralf, 5,461,951, Cl. 81-412.000.

Knisely, Edward E., Jr.: *See—*

Schroepfer, Richard C.; and Knisely, Edward E., Jr., 5,462,457, Cl. 439-736.000.

Knollenberg, Jeffrey L.: *See—*

Pollock, Eugene B.; and Knollenberg, Jeffrey L., 5,462,017, Cl. 119-57.400.

Knoop, Heinz-Peter, to Johann Knupp GmbH & Co. Information carrier for clamping onto rods, particularly clothes rods. 5,461,759, Cl. 24-555.000.

Knöpfli, Bruno; and Bühlmann, Ulrich, to Kuhni AG. Process and apparatus for the production of expanded grids. 5,461,761, Cl. 29-6.100.

Knorr Brake Holding Corp.: *See—*

Engle, Thomas H., 5,462,394, Cl. 410-59.000.

Knudson, C. Michael: *See—*

Campbell, Kevin P.; Knudson, C. Michael; Kahl, Steven D.; Louis, Charles F.; and Mickelson, James R., 5,462,857, Cl. 435-7.210.

Ko, Cheng-Hsu. Dynamic channel allocation method and system for integrated services digital network. 5,463,629, Cl. 370-110.100.

Koa Oil Company, Ltd.: *See—*

Okamura, Okiyoshi; Sakai, Katsuma; and Yoshimura, Mitsunori, 5,462,816, Cl. 429-18.000.

Kobayakawa, Takashi; Imura, Satoshi; Itonaga, Kazumasa; and Kuramoto, Kazuhiko, to Tokuyama Corporation. Photochromic composition. 5,462,698, Cl. 252-586.000.

Kobayashi, Hiroko: *See—*

Hayashi, Kenji; Watanabe, Nobuhisa; Nose, Koichi; Tanaka, Hiroshi; Ohtsuka, Issei; Kokushi, Motoji; Hiyoshi, Hironobu; Kobayashi, Hiroko; Yamada, Toshie; and Horie, Toru, 5,462,958, Cl. 514-399.000.

Kobayashi, Kazuaki; and Kobayashi, Kazuo, to Itoh Electric Company Limited. Conveyer device and connection structure of rollers incorporating motors. 5,462,156, Cl. 198-788.000.

Kobayashi, Kazuo: *See—*

Kobayashi, Kazuaki; and Kobayashi, Kazuo, 5,462,156, Cl. 198-788.000.

Kobayashi, kazuya; Miyasaka, Kiyoshi; and Ogawa, Junji, to Fujitsu Limited. Semiconductor memory device capable of multidirection data access. 5,463,582, Cl. 365-189.050.

Kobayashi, Masanobu; Itoh, Motoi; Matsuhisa, Yoji; and Shimizu, Kazuharu, to Toray Industries, Inc. Carbon fibers and process for preparing same. 5,462,799, Cl. 428-364.000.

Kobayashi, Mitsuteru: *See—*

Shinbo, Yutaka; Kajimoto, Takeshi; Kobayashi, Mitsuteru; and Sato, Katsuyuki, 5,463,249, Cl. 257-690.000.

Kobayashi, Shigeo, to Hitachi Computer Products (America), Inc. Personal processor module and docking station for use therewith. 5,463,742, Cl. 395-281.000.

Kobaysahi, Noboru, to Yamaha Hatsudoki Kabushiki Kaisha. Jet propulsion unit and prime mover therefore. 5,462,460, Cl. 440-6.000.

Köberlein, Josef: *See—*

Demar, Adelbert; Ebner, Wolfgang; Meinfelder, Horst; and Köberlein, Josef, 5,462,155, Cl. 198-760.000.

Kobuke, Yoshiaki; Togashi, Akio; Ozawa, Masaki; and Watanabe, Masayuki, to Doryokuro Kakunenryo Kaihatsu Jigyodan. Extractant for selectively extracting strontium from aqueous solution containing the same. 5,463,099, Cl. 556-117.000.

Koch, Bruno; and Schacher, Gottlieb, to Hoffmann-La Roche Inc. Cuvette conveyor. 5,462,715, Cl. 422-64.000.

Koch, David L.: *See—*

Pascucci, Gregory A.; Rasmussen, David E.; Decious, Gaylon M.; Garbe, James R.; Hyzer, Susan M.; Woest, Karen L.; Vairavan, Vairavan; Koch, David L.; Gottschalk, Donald A., Jr.; Burkhardt, Dennis E.; Standish, Darrell E.; Madaus, Paul W.; Spacek, Dan J.;, 5,463,735, Cl. 395-200.100.

Koch, Klaus; Fuchs, Michael; and Fecker, Viktor, to Bizerba-Werke Wilhelm Kraut GmbH & Co. KG. Cold meat slicer. 5,461,957, Cl. 83-713.000.

Koch, Ulrich H.: *See—*

Perusek, Robert V.; Koch, Ulrich H.; and Kalata, Gregory S., 5,462,081, Cl. 137-498.000.

Koda, Shinsuke: *See—*

Katoh, Hisashi; Nakajima, Tadayoshi; Hata, Tsunehisa; Miyano, Hideyo; and Koda, Shinsuke, 5,462,108, Cl. 164-98.000.

Kodama, Katsunori: *See—*

Daimon, Junko; Takeda, Yasuo; and Kodama, Katsunori, 5,461,825, Cl. 47-71.000.

Kodama, Shinji, to Yazaki Corporation. Connector disconnection sensing mechanism. 5,462,450, Cl. 439-489.000.

Koederitz, Eugene H.: *See—*

Pritchard, Francis E.; Koederitz, Eugene H.; Fuhrhop, Ronald E.; and Barker, Thomas H., Jr., 5,462,429, Cl. 431-3.000.

Koekman, Bertus P.: *See—*

Groenen, Martinus A. M.; Veenstra, Annemarie E.; Van Solingen, Pieter; Koekman, Bertus P.; Van Der Voort, Lucia H. M.; Martin, Juan F.; Gutierrez, Santiago; Diez, Bruno; Alvarez, Emilio; Barredo, Jose L.; and Esmahan, Christina, 5,462,862, Cl. 435-69.100.

Koen, Edward F., to Lucas-Novasensor. Pressure sensor isolated within housing having integral diaphragm and method of making same. 5,461,922, Cl. 73-756.000.

Koenck, Steven E., to Norand Corporation. Fast battery charging system and method. 5,463,305, Cl. 320-21.000.

Koenig & Bauer Aktiengesellschaft: *See—*

Lehrieder, Erwin P. J.; and Mezger, Frans K., 5,461,851, Cl. 59-4.000.

Schneider, Georg, 5,461,981, Cl. 101-415.100.

Koenitzer, Jeff D., to Helwig Carbon Products, Inc. Constant force brush holder assembly. 5,463,264, Cl. 310-242.000.

Koga, Hideaki: *See—*

Miyoshi, Yoshihiro; Shiraishi, Hiroyuki; Kawai, Kiyoshi; and Koga, Hideaki, 5,463,000, Cl. 526-119.000.

Kogge, Peter M.: *See—*

Brodnax, Timothy B.; Bullis, Bryan K.; King, Steven A.; Kogge, Peter M.; and Rickard, Dale A., 5,463,746, Cl. 395-375.000.

Koguchi, Yoshihito: *See—*

Sumikawa, Michito; Koguchi, Yoshihito; Ohgane, Takao; Irie, Yasuo; and Takahashi, Satoji, 5,463,116, Cl. 562-450.000.

Kohara, Teiji: *See—*

Hosaka, Tohru; Mizuno, Hideharu; Koushima, Yuji; Kohara, Teiji; and Natsuume, Tadao, 5,462,995, Cl. 525-332.100.

Kohno, Nobuo, to Sony Corporation. Card printing apparatus. 5,462,374, Cl. 400-625.000.

Kohno, Takashi: *See—*

Nakano, Masaaki; Inoue, Tomoaki; Amano, Hideaki; Takatsuka, Akio; Beppu, Osamu; Mori, Kenji; Yoshida, Takashi; and Kohno, Takashi, 5,463,511, Cl. 360-99.080.

Kohno, Yoshio: *See—*

Kuriyama, Hirotada; and Kohno, Yoshio, 5,463,576, Cl. 365-63.000.

Kohso, Hiroshi: *See—*

Inagaki, Tatsuhiko; Kohso, Hiroshi; and Kuwamoto, Makoto, 5,463,609, Cl. 369-112.000.

Koide, Fuminori: *See—*

Yui, Toshitake; Yamashita, Yoshiro; Koide, Fuminori; Chujo, Akihiko; and Hashimoto, Ken, 5,462,590, Cl. 106-20.00R.

Koiduka, Tomonari, to Houei Co., Ltd. Mat, mat with name and method for anchoring name seal. 5,461,748, Cl. 15-161.000.

Koike, Yuichi: *See—*

Umeda, Yasushi; Tomiyama, Tetsuo; Yoshikawa, Hiroyuki; and Koike, Yuichi, 5,463,545, Cl. 364-187.000.

Koishi, Tetsuya; Akiyama, Noboru; and Kumai, Yasuto, to Advantest Corporation. Automatic pattern synchronizing circuit of an error detector. 5,463,639, Cl. 371-27.004.

Koito Manufacturing Co., Ltd.: *See—*

Wakimizu, Yukio; Motiduki, Kunimasa; and Nagasawa, Masakazu, 5,463,270, Cl. 313-318.010.

Koizumi, Hideki: *See—*

Naka, Michiharu; Koizumi, Hideki; Takahashi, Yuzo; Kinoshita, Hirotugu; and Mishima, Masaru, 5,462,684, Cl. 252-51.50R.

Koizumi, Kyoko: *See—*

Hara, Koji; Fujita, Koki; Kuwahara, Nobuhiro; Kitahata, Sumio; and Koizumi, Kyoko, 5,463,039, Cl. 536-124.000.

Kojima, Kenji: *See—*

Kurotori, Tsuneo; Mochizuki, Manabu; Ariyama, Kenzo; Kojima, Kenji; Tsuruoka, Ichiro; Echigo, Katsuhiro; Miyao, Mayumi; and Ikeda, Itsuo, 5,463,453, Cl. 355-256.000.

Kojima, Kunio: *See—*

Ito, Susumu; and Kojima, Kunio, 5,462,428, Cl. 425-567.000.

Kojima, Tadao: *See—*

Tamazawa, Kazuharu; Kojima, Tadao; Arima, Hideki; Murakami, Yukiyasu; Isomura, Yasuo; Okada, Minoru; Takanobu, Kiyoshi; and Takenaka, Toichi, 5,463,064, Cl. 546-281.000.

Kojima, Yoshikazu: *See—*

Takahashi, Kunihiro; Kamiya, Masaaki; Kojima, Yoshikazu; and Takasu, Hiroaki, 5,463,238, Cl. 257-351.000.

Kok, Tat C., to Ever-Success Development Co., Ltd. Measuring instrument and method of making same. 5,461,795, Cl. 33-483.000.

Kokan Mining Co., Ltd.: *See—*

Sugiyama, Shunichi; Kametani, Hiroshi; Yoshikoshi, Hideyuki; Ikeda, Nobuaki; and Hara, Tomihiro, 5,462,686, Cl. 252-62.620.

Kokubu, Jun; Hiro, Yasuo; Hisano, Katsuhiko; and Watanabe, Susumu, to Mitsubishi Gas Chemical Co., Ltd. Stabilized particle of sodium percarbonate. 5,462,804, Cl. 428-402.240.

Kokusai Denshin Denwa Company, Ltd.: *See*—

Horiuchi, Yukio; and Ryu, Shiro, 5,463,461, Cl. 356-349.000.

Kokusai Denshin Denwa Co., Ltd.: *See*—

Kai, Osamu; Muroi, Junichi; Suzuki, Nobuo; Takagi, Tatsumi; Sakata, Shigekazu; and Oikawa, Hideyuki, 5,463,679, Cl. 379-145.000.

Kokushi, Motoji: *See*—

Hayashi, Kenji; Watanabe, Nobuhisa; Nose, Koichi; Tanaka, Hiroshi; Ohtsuka, Issei; Kokushi, Motoji; Hiyoshi, Hironobu; Kobayashi, Hiroko; Yamada, Toshie; and Horie, Toru, 5,462,958, Cl. 514-399.000.

Kolacz, David J.: *See*—

McMillan, Stewart G.; and Kolacz, David J., 5,462,228, Cl. 239-285.000.

Kolesa, Michael S.; Mastri, Dominick L.; Young, Wayne P.; and Bolanos, Henry, to United States Surgical Corporation. Suture clip applier. 5,462,558, Cl. 606-139.000.

Kollar, John. Recycling process for the production of adipic acid and other aliphatic dibasic acids. 5,463,119, Cl. 562-543.000.

Komachi, Yuichi; and Wakaki, Moriaki, to Kabushiki Kaisha Machida Seisakusho. Laser beam generator. 5,463,651, Cl. 372-92.000.

Komamura, Kouichi: *See*—

Ogura, Kuniaki; Ishikawa, Hiroyuki; Maeda, Yoshiaki; and Komamura, Kouichi, 5,462,577, Cl. 75-345.000.

Komatsu, Hironori: *See*—

Fukazawa, Nobuyuki; Suzuki, Tsuneji; Kawauchi, Nobuya; Komatsu, Hironori; Otsuka, Kengo; and Nakajima, Yuki, 5,463,061, Cl. 546-158.000.

Kometani, Shinji: *See*—

Takao, Shino; Kometani, Shinji; and Saito, Hitoshi, 5,462,911, Cl. 503-227.000.

Komori Corporation: *See*—

Maejima, Kazuhiro; and Takemata, Toshiharu, 5,461,980, Cl. 101-415.100.

Komura, Atushi; Kondo, Kenji; and Kuroyanagi, Akira, to Nippondenso Co., Ltd. Method of forming a sidewall on a semiconductor element. 5,462,896, Cl. 437-228.000.

Kondo, Kazuo: *See*—

Hayashida, Haruo; Ichige, Akihiro; Ogawa, Tadatoshi; Yamada, Takeshi; Tada, Teruo; Zenigame, Masaaki; Wano, Toyoki; and Kondo, Kazuo, 5,462,777, Cl. 428-2.000.

Kondo, Kenji: *See*—

Hiroshima, Yasunori; and Kondo, Kenji, 5,462,512, Cl. 483-57.000.

Komura, Atushi; Kondo, Kenji; and Kuroyanagi, Akira, 5,462,896, Cl. 437-228.000.

Kondo, Tomoharu: *See*—

Abe, Fumio; Kondo, Tomoharu; and Deguchi, Yuuji, 5,463,206, Cl. 219-553.000.

Kondoh, Masatoshi, to Sumitomo Heavy Industries Ltd. Method for manufacturing a laminated coil. 5,462,763, Cl. 427-96.000.

Kondoh, Nobuo: *See*—

Iwao, Toru; Hirai, Kenichi; Kondoh, Nobuo; Yamanouchi, Koichi; and Yokoyama, Kazumasa, 5,462,951, Cl. 514-334.000.

Konica Corporation: *See*—

Kawada, Sunao; Inagi, Masataka; Iwamura, Yoshio; Itoh, Toyotsugu; and Hashimoto, Takayoshi, 5,463,503, Cl. 359-838.000.

Shibazaki, Osamu; and Ohkubo, Hitoshi, 5,462,710, Cl. 264-297.200.

Tosaka, Yasuo, 5,462,844, Cl. 430-503.000.

Konishi, Hirokazu: *See*—

Yamamoto, Taizo; Konishi, Hirokazu; Kawaguchi, Yoshihisa; and Nagao, Akira, 5,463,465, Cl. 356-394.000.

Konishi, Toshio; Horibe, Toshihiko; Yashiro, Toru; Watanabe, Kouji; and Shuin, Toshiya, to Nikon Corporation. Plastic lens. 5,462,806, Cl. 428-451.000.

Konkol, Patrick A.: *See*—

Lakes, A. Dale; Konkol, Patrick A.; and Ribar, Edward M., 5,462,909, Cl. 503-201.000.

Konno, Fumitomo, to Yamaha Corporation. Musical tone forming apparatus. 5,463,183, Cl. 84-604.000.

Konoike, Toshiro; Araki, Yoshitaka; Hayashi, Tetsuyoshi; Sakurai, Kensuke; and Tozyo, Takehiko, to Shionogi & Co., Ltd. Triterpene derivatives and endothelin-receptor antagonists containing the same. 5,463,107, Cl. 560-43.000.

Konrad, Kenneth D.: *See*—

Coassin, Peter J.; Konrad, Kenneth D.; Rampal, Jang B.; and Cook, Ronald M., 5,462,854, Cl. 435-6.000.

Koo, Hee S., to Goldstar Co., Ltd. Image projector. 5,463,433, Cl. 353-84.000.

Kopke, Helmut: *See*—

Keller, Harald; Jaeger, Ulrich; Steininger, Helmut; Kopke, Helmut; Schomann, Klaus D.; and Schildberg, Hans-Peter, 5,462,810, Cl. 428-694.00T.

Körber, Joachim; Niemann, Klaus; Frederich, Fritz; and Günther, Christian, to AEG Westinghouse Transport-Systeme GmbH. Driving and braking control of vehicles equipped with a plurality of single wheel drive and brake modules. 5,463,550, Cl. 364-426.010.

Kores, Dietmar: *See*—

Leitner, Harald; Wörther, Rudolf H.; Korntner, Horst; Schneider, Rudolf; Auer, Engelbert; Kores, Dietmar; and Tramberger, Hermann, 5,462,914, Cl. 504-238.000.

Koriyama, Hiroshi, to NEC Corporation. Magnetic head supporting structure with a bearing fixed to a radially thin wall part of a sleeve located between an arm holder and the bearing. 5,463,515, Cl. 360-106.000.

Korntner, Horst: *See*—

Leitner, Harald; Wörther, Rudolf H.; Korntner, Horst; Schneider, Rudolf; Auer, Engelbert; Kores, Dietmar; and Tramberger, Hermann, 5,462,914, Cl. 504-238.000.

Korpman, Ralf, to McNeil-PPC, Inc. Molten adhesive fibers and products made therefrom. 5,462,538, Cl. 604-372.000.

Korsunsky, Iosif; Harlan, Tod M.; and Shipe, Joanne E., to Whitaker Corporation, The. Electrical connector having bus bars providing circuit board retention. 5,462,444, Cl. 439-108.000.

Korytkowski, Henry M.: *See*—

Campbell, Dean B.; and Korytkowski, Henry M., 5,463,429, Cl. 348-128.000.

Kos, Bernd; and Marhold, Harald. Method for the extraction of the metallic phase from dispersed mixtures of light metals and nonmetallic components. 5,462,578, Cl. 75-404.000.

Kosaka, Michitaka: *See*—

Maeda, Akira; Sugimura, Yoshikane; Funabashi, Motohisa; Nakano, Toshihiko; Someya, Ryuko; and Kosaka, Michitaka, 5,463,718, Cl. 395-23.000.

Kosaka, Yoko; Takiguchi, Takao; Iwaki, Takashi; Togano, Takeshi; Nakamura, Shinichi; and Nakazawa, Ikuo, to Canon Kabushiki Kaisha. Mesomorphic compound, liquid crystal composition containing the compound, liquid crystal device using the composition, liquid crystal apparatus and display method. 5,462,694, Cl. 252-299.610.

Kosako, Kosei, to Asahi Kogaku Kogyo Kabushiki Kaisha. Parallax correcting mechanism of a zoom finder of a camera. 5,463,438, Cl. 354-221.000.

Koselka, Harvey A.: *See*—

Benjamin, Michael H.; Bobick, Aaron F.; Koselka, Harvey A.; and Ulrich, W. Thatcher, 5,462,503, Cl. 482-4.000.

Koshikawa, Yasuji, to NEC Corporation. Memory in which improvement is made as regards a precharge operation of data readout routes. 5,463,581, Cl. 365-189.010.

Kossovsky, Nir; and Bunshah, Rointan F., to University of California, The Regents of the. Biologically active compositions having a nanocrystalline core. 5,462,750, Cl. 424-493.000.

Kossovsky, Nir; Hnatyszyn, H. James; and Gelman, Andrew, to University of California, The Regeants of the. Biological and pharmaceutical agents having a nanomeric biodegradable core. 5,462,751, Cl. 424-494.000.

Kosugi, Masanori: *See*—

Kamiyama, Shiro; Kosugi, Masanori; Kurata, Masahiro; Shiraishi, Sadao; and Sasaki, Nobuyoshi, 5,462,634, Cl. 216-85.000.

Kotobuki & Co., Ltd.: *See*—

Kageyama, Hidehei; Anzai, Shouji; and Mitsuya, Yoshihide, 5,462,376, Cl. 401-65.000.

Kotwicki, Allan J.; Szuszman, Paul J.; Christensen, Edward L.; and Lloyd, Susan J., to Ford Motor Company. Air/fuel phase control. 5,462,038, Cl. 123-681.000.

Koushima, Yuji: *See*—

Hosaka, Tohru; Mizuno, Hideharu; Koushima, Yuji; Kohara, Teiji; and Natsuume, Tadao, 5,462,995, Cl. 525-332.100.

Kovac, Caroline A.: *See*—

Viehbeck, Alfred; Goldberg, Martin; Tisdale, Stephen L.; Buchwalter, Stephen L.; Grebe, Kurt R.; Kovac, Caroline A.; and Matthew, Linda C., 5,462,628, Cl. 156-281.000.

Koyano, Hitoshi; and Sakaguchi, Shozo, to Jidosha Kiki Co., Ltd. Proportioning valve. 5,462,341, Cl. 303-9.750.

Kozo, Maria J.: *See*—

Brightman, Timothy H.; Gulick, Kenneth; Hanson, Robert L.; Herrick, Brian R.; Jeffery, Edwin A.; Kozo, Maria J.; and Swanson, Carl A., 5,462,350, Cl. 312-351.700.

Kozuki, Susumu: *See*—

Harigaya, Isao; Mogi, Hirokazu; Kozuki, Susumu; Iijima, Ryunosuke; Toyama, Masamichi; and Hirasawa, Masahide, 5,463,442, Cl. 354-400.000.

Kraft, Douglas R.: *See*—

Gruender, Eugene H., Jr.; Clark, C. W.; and Kraft, Douglas R., 5,463,589, Cl. 365-230.010.

Kraft Foods, Inc.: *See*—

Mehnert, David W., 5,462,755, Cl. 426-36.000.

Krafty, Francis A.: *See*—

Chiu, Tzu-Yin; Erceg, Frank M.; Krafty, Francis A.; Liu, Te-Yin M.; Possanza, William A.; and Sung, Janmye, 5,462,888, Cl. 437-57.000.

Kramer, Hans, to Kilian & Co. GmbH. Rotary tablet press. 5,462,427, Cl. 425-231.000.

Kramer, Lawrence S.: *See*—

Langan, Timothy J.; Pickens, Joseph R.; Heubaum, Frank H.; and Kramer, Lawrence S., 5,462,712, Cl. 420-528.000.

Kramer, Robert G., to C.W. Zumbiel Co., The. Disc package. 5,462,158, Cl. 206-307.000.

Krämer, Rudolf; and Schaarschmidt, Manfred, to Whitaker Corporation, The. Solderless boardlock. 5,462,454, Cl. 439-571.000.

Kramer, Werner; and Wess, Günther, to Hoechst Aktiengesellschaft. Modified bile acid conjugates, and their use as pharmaceuticals. 5,462,933, Cl. 514-176.000.

Krammer, Erich: *See*—

Jordan, Hermann; Krammer, Erich; Rogatschnig, Johann T.; Den Ouden, Petronella H.; and Span, Francis J., 5,462,557, Cl. 606-133.000.

Krause, Friedemann, to Boehringer Mannheim GmbH. Apparatus for the detection of a fluid phase boundary in a transparent measuring tube and for the automatic exact metering of an amount of liquid. 5,463,228, Cl. 250-577.000.

Krautkramer GmbH & Co.: *See—*

Prause, Reinhard; Patzke, Ottokar; Pawelletz, Reinhard; and Harbach, Bernhard, 5,461,920, Cl. 73-622.000.

Krawczyk, John: *See—*

Bialkowski, Jan; and Krawczyk, John, 5,463,777, Cl. 395-600.000.

Krebs, Stefan; Kettl, Ludwig; and Cianciara, Wojciech, to Siemens Aktiengesellschaft. Method for distinguishing causes of error in the mixture forming or mixture regulating system of an internal combustion engine. 5,462,040, Cl. 123-688.000.

Kreiffels, Jerry A.: *See—*

Fandrich, Mickey L.; Lee, Kelvin W.; Kreiffels, Jerry A.; Kynett, Virgil N.; and Robinson, Kurt B., 5,463,757, Cl. 395-430.000.

Krepley, Charles R.: *See—*

Wilt, Truman F.; Hayes, Deborah E.; Krepley, Charles R.; and Rardon, Daniel E., 5,462,992, Cl. 525-176.000.

Kretschmer, Frank F., Jr., to United States of America, Navy. MTI using a polyphase code. 5,463,399, Cl. 342-132.000.

Krieger, Allen S.: *See—*

Burstein, Paul; Krieger, Allen S.; and Kubierschky, Klaus, 5,463,224, Cl. 250-366.000.

Kroiss, Daniel: *See—*

Jacobson, Peter; Kroiss, Daniel; and Henry, Christine, 5,462,060, Cl. 128-702.000.

Krolopp, Robert K.: *See—*

Dillon, Thomas M.; Krolopp, Robert K.; and Metroka, Michael P., 5,463,646, Cl. 371-69.100.

Kronberg, James W., to United States of America, Energy. Apparatus for detecting the presence of a liquid. 5,463,377, Cl. 340-605.000.

Kronenberg, Klemens: *See—*

Bullmer, Wolfgang; Kronenberg, Klemens; and Ott, Herbert, 5,462,501, Cl. 477-155.000.

Krueger, Dennis L.: *See—*

Swenson, Douglas A.; Fox, Herbert J.; Krueger, Dennis L.; and Lockridge, Rochelle L., 5,462,708, Cl. 264-174.110.

Krueger International, Inc.: *See—*

Baumann, Stephen J., 5,462,338, Cl. 297-411.370.

Krüger, Bernd-Wieland: *See—*

Fischer, Reiner; Bretschneider, Thomas; Krüger, Bernd-Wieland; Erdelen, Christoph; Santel, Hans-Joachim; Lürssen, Klaus; Schmidt, Robert R.; Wachendorff-Neumann, Ulrike; and Stendel, Wilhelm, 5,462,913, Cl. 504-138.000.

Krumboltz, Howard D.: *See—*

Bobb, Lloyd C.; and Krumboltz, Howard D., 5,461,926, Cl. 73-800.000.

Bobb, Lloyd C.; and Krumboltz, Howard D., 5,461,927, Cl. 73-800.000.

Krumm, Herbert; and Wiemers, Karl, to Rheinmetall GmbH. Gun silencer arrangement. 5,461,962, Cl. 89-14.400.

Krupp Polysius AG: *See—*

Kastingschafer, Gerhard; Auf dem Venne, Johannes; Pingel, Herbert; Giesemann, Reinhard; Peterwerth, Bernhard; Gerhardt, Klaus; and Gebbe, Reinhold, 5,462,370, Cl. 384-549.000.

Patzelt, Norbert; Blasczyk, Gotthard; and Eickholt, Hubert, 5,462,234, Cl. 241-19.000.

Kruse, Chris G.: *See—*

Ten Hoeve, Wolter; Thiecke, Jantje R. G.; Wynberg, Hans; and Kruse, Chris G., 5,463,050, Cl. 540-575.000.

Kruse, Gary L.: *See—*

Petersen, Bernard L.; Ledford, Alan M.; and Kruse, Gary L., 5,461,956, Cl. 83-221.000.

Kruse, Jurgen M.: *See—*

Paton, Anthony D.; and Kruse, Jurgen M., 5,463,416, Cl. 347-100.000.

Kruse, Robert J.; Law, Harmon F.; and Wagner, Steven R., to Advanced Protocol Systems, Inc. Method and apparatus for establishing a full-duplex, concurrent, voice/non-voice connection between two sites. 5,463,616, Cl. 370-24.000.

Krysinski, Tomasz: *See—*

Jalaguier, Jean P.; and Krysinski, Tomasz, 5,461,796, Cl. 33-233.000.

Kubierschky, Klaus: *See—*

Burstein, Paul; Krieger, Allen S.; and Kubierschky, Klaus, 5,463,224, Cl. 250-366.000.

Kubo, Hitoshi, to Kabushiki Kaisha Toshiba. Apparatus and method for supervising multiprocessor communications using messages transmitted between processors in a circular fashion. 5,463,763, Cl. 395-182.020.

Kubo, Masahiko, to Kabushiki Kaisha Toshiba. Insulated-gate semiconductor device with a buried insulation layer. 5,463,241, Cl. 257-376.000.

Kubo, Sotoo: *See—*

Iji, Masahiro; Yoda, Masami; Suzuki, Shin; Ishizuka, Kaoru; Kubo, Sotoo; Yamaki, Isao; and Hashimoto, Toshikuni, 5,462,672, Cl. 210-727.000.

Kubo, Toshiya: *See—*

Terao, Kazuhiko; Iida, Hidetoku; Nakayama, Takeyasu; Kubo, Toshiya; Horigome, Jiro; Matsuoka, Yoshihiro; Takeda, Nobutoshi; and Mizuhashi, Tohru, 5,463,709, Cl. 385-85.000.

Kubota, Hideyuki; Horiike, Mitsuaki; and Furukawa, Toshiharu, to Tomoegawa Paper Co., Ltd.; and Sekisui Chemical Co., Ltd. Resin composition for a toner for an electrophotography and the toner comprised the same. 5,462,830, Cl. 430-110.000.

Kubota, Kazuomi; and Murakami, Yoichi, to Dainippon Ink and Chemicals, Inc. Process for producing lactides and process for purifying crude lactides. 5,463,086, Cl. 549-274.000.

Kubota, Naoki; Kinoshita, Osamu; and Kaneko, Yoshio, to Kawasaki Steel Corp. Surface processing apparatus using neutral beam. 5,462,629, Cl. 156-345.000.

Kubota, Tetsumaru: *See—*

Sakurai, Tomohisa; Nagaoka, Yukiko; Kubota, Tetsumaru; and Ikeda, Yuichi, 5,462,522, Cl. 604-22.000.

Kudo, Shingo: *See—*

Sugawara, Tomoo; Kudo, Shingo; and Okumura, Kin-ichi, 5,463,002, Cl. 526-161.000.

Kuenzl, Bernd: *See—*

Reichl, Asta; Jenner, Martin; Witzig, Armin; Rose, Anita; and Kuenzl, Bernd, 5,462,359, Cl. 374-148.000.

Kuga, Masato, to Kabushiki Kaisha Toshiba. Image forming apparatus. 5,463,479, Cl. 358-518.000.

Kugiya, Fumio: *See—*

Kirino, Fumiyoshi; Saito, Atsushi; Toda, Tsuyoshi; Ide, Hiroshi; Tsuchinaga, Hiroyuki; Maeda, Takeshi; and Kugiya, Fumio, 5,463,600, Cl. 369-13.000.

Kugler, Karl-Heinz; Gollin, Walter; Riedel, Karlheinz; and Zimmermann, Christian, to Robert Bosch GmbH. Ignition system for internal combustion engines. 5,462,036, Cl. 123-609.000.

Kuhlman, Harvey G. Liquified food product pump system for supplying of liquified sauces and other products in predetermined quantities. 5,462,210, Cl. 222-380.000.

Kuhlmann, Erven J.; Pascoe, James R.; and Thom, Christopher J., to Texaco Inc. Skeletal isomerization of n-pentenes to isopentene on pretreated zeolites. 5,463,160, Cl. 585-671.000.

Kuhni AG.: *See—*

Knöpfli, Bruno; and Bühlmann, Ulrich, 5,461,761, Cl. 29-6.100.

Kumagai, Junichi: *See—*

Futatsuka, Rensei; Chiba, Shunichi; and Kumagai, Junichi, 5,463,247, Cl. 257-666.000.

Kumagai, Masakatsu; and Fujita, Yoshihisa, to Toyota Tsusho Corporation; Toyota Metal Co., Ltd.; and Senko Kogyo Co., Ltd. Nonferrous material sorting apparatus. 5,462,172, Cl. 209-12.100.

Kumagai, Masato, to Unisia Jecs Corporation. Throttle valve assembly with traction control device. 5,462,026, Cl. 123-396.000.

Kumagai, Ryohei: *See—*

Takatori, Sunao; Kumagai, Ryohei; Matsumoto, Koji; and Yamamoto, Makoto, 5,463,717, Cl. 395-24.000.

Kumai, Yasuto: *See—*

Koishi, Tetsuya; Akiyama, Noboru; and Kumai, Yasuto, 5,463,639, Cl. 371-27.004.

Kumar, Raj: *See—*

Hostetler, Karl Y.; and Kumar, Raj, 5,463,092, Cl. 554-40.000.

Kumasaka, Noriyuki: *See—*

Otomo, Shigekazu; Kumasaka, Noriyuki; Shiiki, Kazuo; Yamashita, Takeo; Saito, Noritoshi; and Tarutani, Yoshinobu, 5,463,518, Cl. 505-171.000.

Kumazawa, Ryoichi; and Nawaki, Masaru, to Sharp Kabushiki Kaisha. Semiconductor memory device including means for checking the operation of an internal address generator. 5,463,635, Cl. 371-21.100.

Kumiya, Hidetoshi: *See—*

Hara, Ryuichi; Nagayama, Atsuo; and Kumiya, Hidetoshi, 5,463,297, Cl. 318-568.130.

Kundu, Aniruddha; and Oztaskin, Ali S., to Intel Corporation. Emulation of slower speed processor. 5,463,744, Cl. 395-375.000.

Kuni, Asahiro: *See—*

Ichinose, Toshiaki; Ninomiya, Takanori; Kuni, Asahiro; Nakahata, Kozo; Hamada, Toshimitsu; and Ayabe, Toshihiko, 5,463,667, Cl. 378-58.000.

Kunieda, Yoshinori: *See—*

Matsuoka, Akihiko; Ohnishi, Hiroshi; Kunieda, Yoshinori; Misaizu, Kouei; and Yamamoto, Yuuri, 5,463,627, Cl. 370-105.100.

Kunitake, Kazuhisa: *See—*

Itou, Takaaki; Tanaka, Hiroshi; Takeda, Keiso; Ohnaka, Hidemi; Kunitake, Kazuhisa; and Tanahashi, Toshio, 5,461,857, Cl. 60-276.000.

Kunkel, Anja: *See—*

Eckel, Hans-Gerd; Kunkel, Anja; and Müller, Michael, 5,462,261, Cl. 267-140.130.

Kuo, James R., to National Semiconductor Corporation. Programmable slew rate CMOS buffer and transmission line driver with temperature compensation. 5,463,331, Cl. 326-86.000.

Kura Industrial Company, Limited: *See—*

Hayashida, Haruo; Ichige, Akihiro; Ogawa, Tadatoshi; Yamada, Takeshi; Tada, Teruo; Zenigame, Masaaki; Wano, Toyoki; and Kondo, Kazuo, 5,462,777, Cl. 428-2.000.

Kuramoto, Kazuhiko: *See—*

Kobayakawa, Takashi; Imura, Satoshi; Itonaga, Kazumasa; and Kuramoto, Kazuhiko, 5,462,698, Cl. 252-586.000.

Kurata, Masahiro: *See—*

Kamiyama, Shiro; Kosugi, Masanori; Kurata, Masahiro; Shiraishi, Sadao; and Sasaki, Nobuyoshi, 5,462,634, Cl. 216-85.000.

Kurauchi, Takeo: *See—*

Miyazoe, Seigo; Hisai, Tsuneyoshi; Fushimi, Akira; Takeoka, Kazuhiko; Okude, Yoshitaka; and Kurauchi, Takeo, 5,462,770, Cl. 427-407.100.

Kurbjuhn, Klaus; and Mueller, Heinz-Dieter, to Siemens Aktiengesellschaft. Plug-type connector. 5,462,443, Cl. 439-78.000.

Kureha Chemical Industry Co., Ltd.: *See—*

Niimura, Koichi; Ikeda, Yuko; Kato, Akira; and Ando, Takao, 5,462,957, Cl. 514-397.000.

Kurihara, Makoto; and Wasaki, Masaru, to TDK Corporation. Discharge lamp lighting apparatus which can control a lighting process. 5,463,287, Cl. 315-308.000.

Kurita, Kazuhiko: *See—*

Hioki, Yuichi; Kurita, Kazuhiko; Kawabata, Keiko; and Azuma, Toshikazu, 5,462,912, Cl. 504-116.000.

Kurita Water Industries Ltd.: *See—*

Iji, Masahiro; Yoda, Masami; Suzuki, Shin; Ishizuka, Kaoru; Kubo, Sotoo; Yamaki, Isao; and Hashimoto, Toshikuni, 5,462,672, Cl. 210-727.000.

Kuriyama, Hirotada; and Kohno, Yoshio, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor memory device including memory cells connected to a ground line. 5,463,576, Cl. 365-63.000.

Kuroda, Kazuyuki: *See—*

Nagami, Tetsuo; Ogura, Yoshitsugu; Ogai, Masahiko; Fukushima, Yoshiaki; Inagaki, Shinji; Fukumoto, Kazuhiro; Banno, Kouji; Sakakibara, Yuji; Takada, Yasuo; Ohta, Takashi; Okada, Akane; Yamada, Yukimura; Hayashi, Kiyotaka; Matsuura, Shinji; and Kuroda, Kaz, 5,462,905, Cl. 502-232.000.

Kuromoto, Traci Y.; Bell, Eric L.; McDugle, Woodrow G.; Eachus, Raymond S.; Puckett, Sherrill A.; Olm, Myra T.; and Wilson, Robert D., to Eastman Kodak Company. Silver halide emulsions with doped epitaxy. 5,462,849, Cl. 430-567.000.

Kurosawa, Miki; Ogawa, Shuji; Sugahara, Masayuki; Funai, Kiyoshi; Yumura, Takashi; and Yamamoto, Tetsu, to Mitsubishi Denki Kabushiki Kaisha. Laser machining apparatus and method. 5,463,202, Cl. 219-121.830.

Kurotori, Tsuneo; Echigo, Katsuhiro; Urakawa, Mitsuaki; Mizuno, Hisamitsu; and Hibi, Kunio, to Ricoh Company, Ltd. Device for removing a toner from a toner image carrier. 5,463,447, Cl. 355-202.000.

Kurotori, Tsuneo; Mochizuki, Manabu; Ariyama, Kenzo; Kojima, Kenji; Tsuruoka, Ichiro; Echigo, Katsuhiro; Miyao, Mayumi; and Ikeda, Itsuo, to Ricoh Company, Ltd. Wet-type image formation apparatus. 5,463,453, Cl. 355-256.000.

Kuroyanagi, Akira: *See—*

Komura, Atushi; Kondo, Kenji; and Kuroyanagi, Akira, 5,462,896, Cl. 437-228.000.

Kuroyone, Kazuo, to Anritsu Corporation. Metallic die device for press machine. 5,462,424, Cl. 425-150.000.

Kusel, Kenneth R.: *See—*

Jacus, Robert J.; Senn, James A.; and Kusel, Kenneth R., 5,462,819, Cl. 429-174.000.

Kuss, Thomas; and Horn, Donald L. Apparatus for demoisturizing coal. 5,462,425, Cl. 425-183.000.

Kuster, Kaspar, to Ciba-Geigy Corporation. Method and apparatus for coating board-shaped articles, especially printed circuit boards. 5,462,599, Cl. 118-503.000.

Kuwahara, Nobuhiro: *See—*

Hara, Koji; Fujita, Koki; Kuwahara, Nobuhiro; Kitahata, Sumio; and Koizumi, Kyoko, 5,463,039, Cl. 536-124.000.

Kuwamoto, Makoto: *See—*

Inagaki, Tatsuhiko; Kohso, Hiroshi; and Kuwamoto, Makoto, 5,463,609, Cl. 369-112.000.

Kvaerner Pulping Technologies Aktiebolag: *See—*

Jansson, Ulf; and Ekholm, Rolf, 5,461,888, Cl. 68-181.00R.

Kwan, Stephen C.: *See—*

Jones, Steven C.; Mukherjee, Subhashish; and Kwan, Stephen C., 5,463,347, Cl. 330-253.000.

Kwasie, Jon B. Melting assembly for thermoplastic materials. 5,462,206, Cl. 222-146.500.

Kwasnick, Robert F.; Wei, Ching-Yeu; and Kingsley, Jack D., to General Electric Company. Solid state radiation imager with high integrity barrier layer and method of fabricating. 5,463,225, Cl. 250-370.110.

Kwasnick, Robert F.; and Pimbley, Joseph M., to General Electric Company. Method of locating common electrode shorts in an imager assembly. 5,463,322, Cl. 324-522.000.

Kwon, Byoung H.: *See—*

Kim, Jung C.; Oh, Dong Y.; Choe, Gyu S.; Hong, Kyung S.; Kim, Kyung H.; Lee, Joo H.; Lee, Ha I.; Park, Kyeong B.; Gil, Dong S.; Kwon, Oh H.; and Kwon, Byoung H., 5,461,886, Cl. 68-3.0SS.

Kwon, Ki-Beom: *See—*

Cho, Jung H.; Oh, Chang H.; and Nam, Ki H., 5,463,046, Cl. 540-350.000.

Kwon, Oh H.: *See—*

Kim, Jung C.; Oh, Dong Y.; Choe, Gyu S.; Hong, Kyung S.; Kim, Kyung H.; Lee, Joo H.; Lee, Ha I.; Park, Kyeong B.; Gil, Dong S.; Kwon, Oh H.; and Kwon, Byoung H., 5,461,886, Cl. 68-3.0SS.

Kwon, Young I., to VLSI Technology, Inc. Embedded inter-connect frame. 5,462,624, Cl. 156-257.000.

Kynett, Virgil N.: *See—*

Fandrich, Mickey L.; Lee, Kelvin W.; Kreiffels, Jerry A.; Kynett, Virgil N.; and Robinson, Kurt B., 5,463,757, Cl. 395-430.000.

Kyocera Corporation: *See—*

Nagano, Saburou; Tateno, Shuichi; Kamitubo, Kouichi; Tajima, Kenichi; and Nakanishi, Masahito, 5,462,813, Cl. 428-698.000.

Kyoko Koizumi: *See—*

Hara, Koji; Fujita, Koki; Kuwahara, Nobuhiro; Kitahata, Sumio; and Koizumi, Kyoko, 5,463,039, Cl. 536-124.000.

L & H Threaded Rods Corp.: *See—*

Gray, John C.; and Shultz, Duane E., 5,461,897, Cl. 72-213.000.

LaBac Systems, Inc.: *See—*

Peek, Gregory A.; Lytle, William B.; and Dyer, John A., 5,462,380, Cl. 403-329.000.

Labsphere, Inc.: *See—*

Springsteen, Arthur W., 5,462,705, Cl. 264-122.000.

Lackey, Milton H.: *See—*

Holmes, John J.; and Lackey, Milton H., 5,463,523, Cl. 361-149.000.

Ladd, Charles S.: *See—*

Lloyd, David H.; DeFranco, Robert J.; and Ladd, Charles S., 5,462,748, Cl. 424-484.000.

Ladd, June E.: *See—*

Ladd, Michael; Ladd, June E.; Hinebaugh, Larry; Hennessy, Jack E.; and Hennessy, Susan C., 5,462,655, Cl. 210-167.000.

Ladd, Michael; Ladd, June E.; Hinebaugh, Larry; Hennessy, Jack E.; and Hennessy, Susan C. Vehicle containment mat with vacuum recovery and recycle means. 5,462,655, Cl. 210-167.000.

Ladewski, Theodore B., to KMS Fusion, Inc. Electro-optical system for gauging surface profile deviations using infrared radiation. 5,463,464, Cl. 356-376.000.

Ladina, Joseph M.; Exley, Timothy R.; and Szedon, William A., to Coca Cola Company, The. Cam follower closure on container with cam track finish. 5,462,186, Cl. 215-330.000.

L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude: *See—*

Bracque, Gilles; Dehaine, Francois; Gourbier, Jean-Pierre; Gourdain, Daniel; Grelaud, Alain; Guillard, Alain; and Mouliney, Michel, 5,461,871, Cl. 62-24.000.

Laiw, Ru-Fong: *See—*

Chen, Jui-Hsiang; Wei, Jeng; Hu, Andrew T.; Lee, Yu-Der; Laiw, Ru-Fong; Chen, Muh-Lan; Chang, Chung-Yi; Lee, Fan-Yen; and Jiang, Shu-Fang, 5,462,704, Cl. 264-41.000.

Lakes, A. Dale; Konkol, Patrick A.; and Ribar, Edward M., to Standard Register Company, The. Color coded, thermally imagable business form. 5,462,909, Cl. 503-201.000.

Lallement, Jacques: *See—*

Delfort, Bruno; Daqudal, Bertrand; Lallement, Jacques; Born, Maurice; Marchand, Pierre; and Hipeaux, Jean-Claude, 5,462,682, Cl. 252-18.000.

Lam Research Corporation: *See—*

Mundt, Randall S., 5,463,526, Cl. 361-234.000.

Lamb, Julian D.: *See—*

Lemon, Francis W.; and Lamb, Julian D., 5,461,752, Cl. 15-257.060.

Lambert, Diane: *See—*

Becker, Richard A.; Clark, Linda A.; and Lambert, Diane, 5,462,438, Cl. 434-430.000.

Lambert, Hans; and Grebius, Jan, to Gibeck Respiration AB. Heat and moisture exchanger. 5,462,048, Cl. 128-201.130.

Lamping, George. Message emitting device. 5,463,369, Cl. 340-384.700.

Lancer Corporation: *See—*

Schroeder, Alfred A., 5,462,413, Cl. 417-310.000.

Land, Harry M.: *See—*

Banik, Niranjan; Land, Harry M.; and Levy, Edward W., 5,461,746, Cl. 15-104.061.

Landén, Jan-Olof, to Husqvarna Aktiebolag. Sewing machine having presser foot lifting device for adjusting a presser foot between first, second, and third positions. 5,461,997, Cl. 112-237.000.

Landoll Corporation: *See—*

Harlan, Robert D.; and Landoll, Donald R., 5,462,123, Cl. 172-454.000.

Landoll, Donald R.: *See—*

Harlan, Robert D.; and Landoll, Donald R., 5,462,123, Cl. 172-454.000.

Landry, Donald W.; and Zhao, Kang, to Trustees of Columbia University in the City of New York, The. Reagents for generating a polyclonal hydrolytic antibody response against cocaine and the monoclonal hydrolytic antibodies against cocaine derived through these reagents. 5,463,028, Cl. 530-405.000.

Lane, Neill W.: *See—*

Beale, William T.; Lane, Neill W.; and McEntee, Jarlath, 5,461,859, Cl. 60-517.000.

Langan, Timothy J.; Pickens, Joseph R.; Heubaum, Frank H.; and Kramer, Lawrence S., to Martin Marietta Corporation. High strength Al-Cu-Li-Zn-Mg alloys. 5,462,712, Cl. 420-528.000.

Langen, Hans-Jürgen; Vollmer, Jürgen; and Sarfert, Andreas, to GKN Walterscheid GmbH. Side strut for a lower steering arm of a tractor. 5,462,303, Cl. 280-455.100.

Lapp, John: *See—*

Hassler, Stephen P.; Johnson, Stephen P.; and Lapp, John, 5,463,366, Cl. 337-176.000.

Lappe, Peter: *See—*

Bahrmann, Helmut; Greb, Wolfgana; Heymanns, Peter; Lappe, Peter; Müller, Thomas; Szameitat, Jürgen; and Wiebus, Ernst, 5,462,986, Cl. 524-296.000.

Bahrmann, Helmut; Greb, Wolfgang; Heymanns, Peter; Lappe, Peter; Müller, Thomas; Szameitat, Jürgen; and Wiebus, Ernst, 5,463,147, Cl. 568-882.000.

Larsen, Charles E.: *See*—
Rosen, Jonathan J.; and Larsen, Charles E., 5,462,255, Cl. 251-149.600.
Larsen, Steven D.: *See*—
Carr, John P.; Larsen, Steven D.; and Eckenhoff, James B., 5,462,741, Cl. 424-438.000.
Laughlin, Darren R., to Maxtor Corporation. Low-profile magnetohydrodynamic motion sensor for an electronic system. 5,461,919, Cl. 73-514.030.
Laurandeau, Leroy: *See*—
Jones, Franklin B.; Nguyen, Ngon B.; and Laurandeau, Leroy, 5,463,252, Cl. 257-723.000.
Lauria, Thomas J. Backflow preventer with failure indicator. 5,462,082, Cl. 137-557.000.
Lavieri, Frank P.: *See*—
Donovan, John W.; and Lavieri, Frank P., 5,463,033, Cl. 534-642.000.
Law, Harmon F.: *See*—
Kruse, Robert J.; Law, Harmon F.; and Wagner, Steven R., 5,463,616, Cl. 370-24.000.
Lawless, Michael W.: *See*—
Minick, Steven E.; Lawless, Michael W.; Soberon, Peter A.; Kaul, Ashok; and Hermann, Robert A., 5,462,256, Cl. 251-331.000.
Lawrence, James L.: *See*—
Winter, Jeffrey J.; Holden, Homer N.; and Lawrence, James L., 5,462,090, Cl. 138-121.000.
Layne, James L.; and Johnson, Mark T., to Span Tech Corporation. Bearing lock system. 5,462,369, Cl. 384-538.000.
Le, Hue P.: *See*—
Karandikar, B. M.; Bui, Loc V.; and Le, Hue P., 5,462,591, Cl. 106-20.00R.
Le, Loc B.: *See*—
Blackbourn, Robert L.; Allan, Edgar D.; Le, Loc B.; and Patel, Snehal, 5,463,136, Cl. 568-385.000.
Lebourges, Marc, to France Telecom. Communication routing method with income optimization for telecommunication networks. 5,463,686, Cl. 379-220.000.
LeClaire, Daniel: *See*—
Giraud, Jean; and LeClaire, Daniel, 5,463,120, Cl. 562-559.000.
Ledford, Alan M.: *See*—
Petersen, Bernard L.; Ledford, Alan M.; and Kruse, Gary L., 5,461,956, Cl. 83-221.000.
Lee, Chein-Dhau: *See*—
Tsai, Wen-Liang; and Lee, Chein-Dhau, 5,462,695, Cl. 252-299.650.
Lee, Edward H. P.: *See*—
Chen, George Y.; and Lee, Edward H. P., 5,462,636, Cl. 216-17.000.
Lee, Fan-Yen: *See*—
Chen, Jui-Hsiang; Wei, Jeng; Hu, Andrew T.; Lee, Yu-Der; Laiw, Ru-Fong; Chen, Muh-Lan; Chang, Chung-Yi; Lee, Fan-Yen; and Jiang, Shu-Fang, 5,462,704, Cl. 264-41.000.
Lee, Gary M.: *See*—
Hou, Donald; Draper, Richard W.; Lee, Gary M.; Mas, Janet L.; and Mergelsberg, Ingrid, 5,463,051, Cl. 540-576.000.
Lee, Ha I.: *See*—
Kim, Jung C.; Oh, Dong Y.; Choe, Gyu S.; Hong, Kyung S.; Kim, Kyung H.; Lee, Joo H.; Lee, Ha I.; Park, Kyeong B.; Gil, Dong S.; Kwon, Oh H.; and Kwon, Byoung H., 5,461,886, Cl. 68-3.0SS.
Lee, Joo H.: *See*—
Kim, Jung C.; Oh, Dong Y.; Choe, Gyu S.; Hong, Kyung S.; Kim, Kyung H.; Lee, Joo H.; Lee, Ha I.; Park, Kyeong B.; Gil, Dong S.; Kwon, Oh H.; and Kwon, Byoung H., 5,461,886, Cl. 68-3.0SS.
Lee, Kab Y.; Yoo, Hee-Sang; and Jang, Young C., to Samsung Electronics Co., Ltd. Automatic outlet opening/closing apparatus of air-conditioner and control method thereof. 5,461,875, Cl. 62-89.000.
Lee, Kelvin W.: *See*—
Fandrich, Mickey L.; Lee, Kelvin W.; Kreiffels, Jerry A.; Kynett, Virgil N.; and Robinson, Kurt B., 5,463,757, Cl. 395-430.000.
Lee, Keun Y.: *See*—
Hwang, Sung B.; and Lee, Keun Y., 5,462,890, Cl. 437-187.000.
Lee, Meng-Chang. Tire puncture repair device. 5,461,945, Cl. 81-15.700.
Lee, Min-Kuo, to Hi-Star Co., Ltd. Roller-skate with improved brake device. 5,462,297, Cl. 280-11.200.
Lee, Shau-Tarng, to Sealed Air Corporation. Expandable composition and process for extruded thermoplastic foams. 5,462,974, Cl. 521-79.000.
Lee, Young: *See*—
Collins, Cynthia B.; Lee, Young; and Tagatac, Daniel D., 5,463,683, Cl. 379-201.000.
Lee, Yu-Der: *See*—
Chen, Jui-Hsiang; Wei, Jeng; Hu, Andrew T.; Lee, Yu-Der; Laiw, Ru-Fong; Chen, Muh-Lan; Chang, Chung-Yi; Lee, Fan-Yen; and Jiang, Shu-Fang, 5,462,704, Cl. 264-41.000.
LeFavor, Richard. Handcuff leverage device. 5,461,890, Cl. 70-16.000.
LeFiles, James H.; Taylor, Evelyn J.; and Crawford, Mark A., to Griffin Corporation. Copper hydroxide dry flowable bactericide/fungicide and method of making and using same. 5,462,738, Cl. 424-409.000.
Lehrieder, Erwin P. J.; and Mezger, Frans K., to Koenig & Bauer Aktiengesellschaft. Roller chain. 5,461,851, Cl. 59-4.000.
Lehton, Eino M.; and Finkelstein, Burl, to Kason Industries, Inc. Trolley rail system for sliding door. 5,461,829, Cl. 49-409.000.
Lei, Cheong S., to Jactoys Limited. Apparatus and method for making bubbles. 5,462,469, Cl. 446-15.000.
Leiberich, Ricarda: *See*—
Schön, Norbert; Rechner, Johann; Wagner, Paul; Buysch, Hans-Josef; Gasche, Hans-Erich; and Leiberich, Ricarda, 5,463,102, Cl. 558-274.000.
Leibfried, Ulrich: *See*—
Kleinwächter, Jürgen; and Leibfried, Ulrich, 5,462,047, Cl. 126-639.000.
Leifeld, Ferdinand, to Trützschler GmbH & Co. KG. Apparatus for measuring the sliver density at a tapering sliver guide in a drafting frame. 5,461,757, Cl. 19-239.000.
Leising, Maurice B.: *See*—
Benford, Howard L.; and Leising, Maurice B., 5,462,500, Cl. 477-154.000.
Leith, Graham: *See*—
Buckley, Peter; Cousins, Lisa; Daynes, Todd; Gretxhev, Val; Hirasawa, Drake; and Leith, Graham, 5,463,219, Cl. 250-281.000.
Leitko, Curtis E.: *See*—
Cohen, John H.; Leitko, Curtis E.; Pittard, Gerard T.; Clifton, Terry P.; and Rockower, Gerald, 5,462,077, Cl. 137-15.000.
Leitner, Harald; Wörther, Rudolf H.; Korntner, Horst; Schneider, Rudolf; Auer, Engelbert; Kores, Dietmar; and Tramberger, Hermann, to Sandoz Ltd. Herbicidal n-cyanopyridazinones. 5,462,914, Cl. 504-238.000.
Leitner, Horst. Double swingarm front suspension for bicycles and motorcycles. 5,462,302, Cl. 280-277.000.
LeMarr, Wes: *See*—
Trattner, Burton C.; and LeMarr, Wes, 5,463,537, Cl. 362-103.000.
Lemelson, Jerome H. Towed watercraft and steering method. 5,462,001, Cl. 114-253.000.
Lemelson, Jerome H. Methods for forming artificial diamond. 5,462,772, Cl. 427-554.000.
Lemon, Francis W.; and Lamb, Julian D. Paint tray assembly, for mounting on either one of the uprights of a ladder. 5,461,752, Cl. 15-257.060.
Lemper, Herbert; Ellis, Robert H.; and Fabian, Richard A., to Danieli United, Inc. High capacity hydraulic leveller. 5,461,895, Cl. 72-21.000.
Lenhardt, Karl, to Lenhardt Maschinenbau GmbH. Apparatus for discharging pasty compressible substances of high viscosity. 5,462,199, Cl. 222-54.000.
Lenhardt Maschinenbau GmbH: *See*—
Lenhardt, Karl, 5,462,199, Cl. 222-54.000.
Leonowich, Robert H., to AT&T Corp. Delay locked loop based clock synthesizer using a dynamically adjustable number of delay elements therein. 5,463,337, Cl. 327-158.000.
Lerner, Ethan A.: *See*—
Lerner, Michael R.; and Lerner, Ethan A., 5,462,856, Cl. 435-7.210.
Lerner, Michael R.; and Lerner, Ethan A., to Bunsen Rush laboratories, Inc. Methods for identifying chemicals that act as agonists or antagonists for receptors and other proteins involved in signal transduction via pathways that utilize G-proteins. 5,462,856, Cl. 435-7.210.
Lesko, Jon M.; Brown, Larry L.; and Keller, James A., to Colorado Seminary. Thermal imaging system for internal combustion engines. 5,463,222, Cl. 250-330.000.
Lessen, Martin. Method and apparatus for extrusion of tubing sheeting and profile shapes. 5,461,898, Cl. 72-256.000.
Letchworth, Geoffrey J., III; and Israel, Barbara A., to Wisconsin Alumni Research Foundation. Bovine herpesvirus vaccine and method of using same. 5,462,734, Cl. 424-229.100.
Letter, William S.: *See*—
Braatz, James A.; Kehr, Clifton L.; Grasel, Timothy G.; and Letter, William S., 5,462,536, Cl. 604-304.000.
Leung, Fan Kai: *See*—
Sham, John C. K.; and Leung, Fan Kai, 5,463,205, Cl. 219-502.000.
Levenstein, Sheldon B., to International Business Machines Corporation. Duplicated logic and interconnection system for arbitration among multiple information processors. 5,463,741, Cl. 395-299.000.
Lever Brothers Company, Division of Conopco, Inc.: *See*—
Batal, David J.; and Madison, Stephen A., 5,463,115, Cl. 562-430.000.
Levi Strauss & Co.: *See*—
Pasad, Dilip; and Garcia, Frank, 5,461,742, Cl. 8-149.200.
Levy, Edward W.: *See*—
Banik, Niranjan; Land, Harry M.; and Levy, Edward W., 5,461,746, Cl. 15-104.061.
Lewis, Bernard L., to United States of America, Navy. ECM for long-range radars. 5,463,396, Cl. 342-15.000.
Lewis, Gerald P.: *See*—
Vincze, Albert M.; Seymour, Theodore J.; Culkeen, Patrick; Tang, Nai-Yong; Lewis, Gerald P.; Niessen, Paul; and Marlow, John V., 5,462,109, Cl. 164-479.000.
Li, Ruey S.: *See*—
Turner, Josephine S.; Murray, D. Gary; Zuccolin, John D.; and Li, Ruey S., 5,462,743, Cl. 424-448.000.
Liang, Septimus H.-C.; Harrison, Brian H.; and Pagotto, Jack, to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. Organic amine impregnated activated carbon. 5,462,908, Cl. 502-401.000.
Liaw, Weikuo: *See*—
Anderson, Charles R.; Warfield, Robert W.; Cseri, Istvan; Low, Murray K.; Liaw, Weikuo; and Bush, Alan M., 5,463,724, Cl. 395-148.000.
Lienhart, Shelly L.; and Rademacher, Roger J., to General Motors Corporation. Fuel cap tether apparatus. 5,462,190, Cl. 220-375.000.
Life Forece Associates, LP: *See*—
Beauvais, Randall, 5,462,333, Cl. 297-216.110.
Lim, Jong C.: *See*—

- Kim, Yong Z.; Oh, Hun S.; Yeo, Jae H.; Lim, Jong C.; Bang, Chan S.; Kim, Won S.; and Yim, Hyeon J., 5,462,935, Cl. 514-206.000.
- Lim, Seng-Sooi: *See—*
  - Chia, Chok J.; Alagaratnam, Manian; Low, Qwai H.; and Lim, Seng-Sooi, 5,463,529, Cl. 361-704.000.
- Lin, Ae-Ning: *See—*
  - Hsieh, Jih-Han; Shih, Shu-Ching; Chi, Wei-Kuang; Chu, Yi-Ding; and Lin, Ae-Ning, 5,462,863, Cl. 435-69.300.
- Lin, Bob. Dither picture data pre-compression processing method. 5,463,703, Cl. 382-251.000.
- Lin, Chien-Hung. Brake mechanism for an automobile. 5,462,502, Cl. 477-197.000.
- Lin, Chin I.: *See—*
  - Chou, Luk; Cheng, Jonathan; and Lin, Chin I., 5,463,536, Cl. 362-102.000.
- Lin, Fan-Nan, to Phillips Petroleum Company. Reactivation of alkane isomerization catalysts. 5,463,166, Cl. 585-748.000.
- Lin, Mon S. Magnetic induction toy. 5,462,472, Cl. 446-135.000.
- Lin, Tien-Ler: *See—*
  - Chao, Liang; Lin, Tien-Ler; and Yiu, Tom D., 5,463,586, Cl. 365-210.000.
- Lind, Eric J.: *See—*
  - Smith, Scott J.; and Lind, Eric J., 5,462,972, Cl. 521-53.000.
- Lindblad, Lennart, to Linvent AB. Device for relative angular setting of two units, preferably the inclination of a vehicle-seat back rest. 5,462,498, Cl. 475-342.000.
- Lindemann, David C.; Chiang, Weilong L.; Luetkens, Melvin L., Jr.; Pischke, Robert D.; and Schubert, John C., to Amoco Corporation. Foamed core-reclaim multi layer sheet having improved resistance to barrier film delamination. 5,462,794, Cl. 428-317.100.
- Lindén, Erkki O.; and Rönnholm, Karl S., to Fiskars Oy Ab. Method of making a pivoted tool having integral pivot member. 5,461,765, Cl. 29-434.000.
- Lindgren, Svante B.: *See—*
  - Kihlberg, Reinhold; Lindgren, Svante B.; and Sandberg, Lars G., 5,462,924, Cl. 574-12.000.
- Lindsey, Joe P.; and Patch, James R. High frequency retention seismic survey method. 5,463,594, Cl. 367-38.000.
- Lindström, Stefan: *See—*
  - Samelius, Anders; Ohlson, Björn; and Lindström, Stefan, 5,462,293, Cl. 279-4.030.
- Linge, Reiner: *See—*
  - Baus, Rüdiger; and Linge, Reiner, 5,461,961, Cl. 89-1.815.
- Linssen, Henricus M. H., to U.S. Philips Corporation. Circuit arrangement for operating a high-pressure discharge lamp. 5,463,281, Cl. 315-209.00R.
- Linvent AB: *See—*
  - Lindblad, Lennart, 5,462,498, Cl. 475-342.000.
- Linz, Guenter: *See—*
  - Himmelsbach, Frank; Linz, Guenter; Austel, Volkhard; Pieper, Helmut; Mueller, Thomas; Weisenberger, Johannes; and Seewaldt-Becker, Elke, 5,463,071, Cl. 548-251.000.
- Liotta, Dennis C.: *See—*
  - Schinazi, Raymond F.; and Liotta, Dennis C., 5,462,724, Cl. 424-1.770.
- Liou, Fu-Tai: *See—*
  - Spinner, Charles R.; and Liou, Fu-Tai, 5,462,894, Cl. 437-195.000.
- Lippman, Jerome; Dolan, Michael J.; Sullivan, John J., Jr.; and Viscovitz, John H., to GOJO Industries, Inc. Flowable, pumpable cleaning compositions and method for the preparation thereof. 5,462,688, Cl. 252-89.100.
- Lipton, Lenny; Halnon, Jeffrey J.; Mitchell, Larry H.; and Hursey, Robert, to StereoGraphics Corporation. Wireless active eyewear for stereoscopic applications. 5,463,428, Cl. 351-158.000.
- Lister, James F. Waist, hip, or shoulder exercise device rolled by the user. 5,462,509, Cl. 482-132.000.
- Litchfield, James F.: *See—*
  - Pedersen, Michael J.; Sampath, Vijay R.; and Litchfield, James F., 5,462,719, Cl. 422-195.000.
- Littau, Cheryl A.: *See—*
  - Brown, David M.; Gatter, Erich M.; and Littau, Cheryl A., 5,463,094, Cl. 554-110.000.
- Litton Systems, Inc.: *See—*
  - Gibbs, David M., 5,463,648, Cl. 372-38.000.
  - Hall, David B., 5,463,652, Cl. 372-94.000.
- Liu, Duixian; and Cota, Glenn L., to Valor Enterprises, Inc. Cellular telephone coupling network. 5,463,405, Cl. 343-715.000.
- Liu, Sung-Tsuen; and Chung, Harvey H. Calcium phosphate calcium sulfate composite implant material. 5,462,722, Cl. 423-311.000.
- Liu, Te-Yin M.: *See—*
  - Chiu, Tzu-Yin; Erceg, Frank M.; Krafty, Francis A.; Liu, Te-Yin M.; Possanza, William A.; and Sung, Janmye, 5,462,888, Cl. 437-57.000.
- Llewellyn, William D., to National Semiconductor Corporation. Single-ended pulse gating circuit. 5,463,655, Cl. 375-359.000.
- Lloyd, David H.; DeFranco, Robert J.; and Ladd, Charles S., to Applied Biosystems, Inc. Biopolymer synthesis apparatus and method. 5,462,748, Cl. 424-484.000.
- Lloyd, Susan J.: *See—*
  - Kotwicki, Allan J.; Szuszman, Paul J.; Christensen, Edward L.; and Lloyd, Susan J., 5,462,038, Cl. 123-681.000.
- Lo, Grace Y.; and Gatzke, Arnold L., to Dow Chemical Company, The. Preparation of conjugated diene-monoalkenyl arene block copolymers having a low polydispersity index. 5,462,994, Cl. 525-314.000.
- Lob, Charles J., to Harken, Inc. Ball bearing block having self-contained bearings. 5,462,368, Cl. 384-512.000.
- Löbberding, Antonius: *See—*
  - Springer, Wolfgang; Rast, Hans G.; Löbberding, Antonius; and Kanne, Reinhard, 5,462,855, Cl. 435-6.000.
- Lockheed Missiles & Space Company, Inc.: *See—*
  - Gal, George; and Morrow, Howard E., 5,463,498, Cl. 359-622.000.
  - Rice, Bart F., 5,463,657, Cl. 375-200.000.
- Lockridge, Rochelle L.: *See—*
  - Swenson, Douglas A.; Fox, Herbert J.; Krueger, Dennis L.; and Lockridge, Rochelle L., 5,462,708, Cl. 264-174.110.
- Lodge, Nicholas J., to Bristol-Myers Squibb Company. Method of inhibiting side effects of solvents containing ricinoleic acid or castor oil or derivatives thereof employing a thromboxane A_2 receptor antagonist and pharmaceutical compositions containing such solvents. 5,462,726, Cl. 514-558.000.
- Loerch, Richard J.: *See—*
  - Sheldon, Paul C.; and Loerch, Richard J., 5,462,511, Cl. 483-1.000.
- Lofton, Nathan. Telescoping window bar unit. 5,461,827, Cl. 49-55.000.
- Logan, Joseph S.: *See—*
  - Barnes, Michael S.; Keller, John H.; Logan, Joseph S.; Tompkins, Robert E.; and Westerfield, Robert P., Jr., 5,463,525, Cl. 361-234.000.
- Logan, Robert T.: *See—*
  - Pick, John H.; and Logan, Robert T., 5,462,959, Cl. 514-400.000.
- Lohmann, Sylvia: *See—*
  - Rohr, Jürgen; Riegels, Martin; and Lohmann, Sylvia, 5,462,565, Cl. 8-531.000.
- Lok, Cornelis M., to Unilever Patent Holdings B.V. Nickel/silica catalyst and the preparation and use thereof. 5,463,096, Cl. 554-146.000.
- Lombi, Roberto: *See—*
  - Bastioli, Catia; Lombi, Roberto; Del Tredici, Gianfranco; and Guanella, Italo, 5,462,982, Cl. 524-47.000.
- Lonardi, Emile; Andonov, Radomir; and Cimenti, Giovanni, to Paul Wurth S.A. Device for inserting a lance into a pressurized container, in particular a blast furnace. 5,462,260, Cl. 266-226.000.
- Longacre, Andrew, Jr.; Hussey, Robert M.; and Pidhirny, John M., to Welch Allyn, Inc. Apparatus for optimizing throughput in decoded-output scanners and method of using same. 5,463,214, Cl. 235-472.000.
- Longsworth, Ralph C., to APD Cryogenics Inc. Means and apparatus for convectively cooling a superconducting magnet. 5,461,873, Cl. 62-51.100.
- Lopez, Bladimir I.: *See—*
  - Deavenport, Joseph L.; and Lopez, Bladimir I., 5,463,127, Cl. 564-292.000.
- Lopez-Ramirez, Juan, to Rockwell International Corporation. Use of at commands to test modem with HP3065. 5,463,633, Cl. 371-20.300.
- Loral Aerospace Corp.: *See—*
  - Halloran, Timothy, 5,463,355, Cl. 332-103.000.
- L'Oreal: *See—*
  - Gueret, Jean-Louis H., 5,462,798, Cl. 428-364.000.
- Loschelder, Todd C.; and Mikol, Erwin F., to Moen Incorporated. Anti-siphon mixing valve. 5,462,079, Cl. 137-216.000.
- Lou, Maurice M. K.: *See—*
  - Tang, Sing C.; Lou, Maurice M. K.; and Balun, Thomas J., 5,463,558, Cl. 364-472.000.
- Louis, Charles F.: *See—*
  - Campbell, Kevin P.; Knudson, C. Michael; Kahl, Steven D.; Louis, Charles F.; and Mickelson, James R., 5,462,857, Cl. 435-7.210.
- Louis, Didier: *See—*
  - Desrosiers, Bernard; Louis, Didier; Pinchon, Didier; and Steimle, Andre, 5,463,574, Cl. 364-748.000.
- Louison, Bernard, to SEB S.A. Brushing device for grooming animals. 5,462,018, Cl. 119-86.000.
- Loup, Didier, to Valeo Thermique Habitacle. Heating and ventilating and/or air conditioning apparatus for the cabin of a motor vehicle. 5,462,483, Cl. 454-160.000.
- Love, W. John, to Caterpillar Inc. Power supply protection circuit. 5,463,521, Cl. 361-58.000.
- Low, Murray K.: *See—*
  - Anderson, Charles R.; Warfield, Robert W.; Cseri, Istvan; Low, Murray K.; Liaw, Weikuo; and Bush, Alan M., 5,463,724, Cl. 395-148.000.
- Low, Qwai H.: *See—*
  - Chia, Chok J.; Alagaratnam, Manian; Low, Qwai H.; and Lim, Seng-Sooi, 5,463,529, Cl. 361-704.000.
- Lowe, Christopher R.: *See—*
  - Britt, Adrian J.; Bruce, Neil C.; and Lowe, Christopher R., 5,462,868, Cl. 435-196.000.
- Lowe, Danny D.; Wilson, Gordon G.; Baker, Michael E.; and Garner, Abram, to Wilson, Gordon; and Lowe, Danny D. Player interactive live action football game. 5,462,275, Cl. 273-94.000.
- LSI Logic Corporation: *See—*
  - Bair, Owen S.; Yin, Patrick; and Chen, Chih-Chung, 5,463,563, Cl. 364-490.000.
  - Chia, Chok J.; Alagaratnam, Manian; Low, Qwai H.; and Lim, Seng-Sooi, 5,463,529, Cl. 361-704.000.
- LTS Lohmann Therapie-Systeme GmbH & Co. KG: *See—*
  - Wolter, Karin; Müller, Walter; Simon, Günter; Nalbach, Christa; and Hoffmann, Hans-Rainer, 5,462,746, Cl. 424-449.000.
- Lubowitz, Hyman R.: *See—*
  - Sheppard, Clyde H.; and Lubowitz, Hyman R., 5,463,076, Cl. 548-431.000.
- Lucas Industries plc: *See—*
  - Thomas, Gerald S., 5,462,252, Cl. 251-25.000.

- Lucas Industries Public Limited Company: *See—*
  - Best, Christopher H., 5,462,033, Cl. 123-502.000.
  - Buckley, Paul, 5,462,028, Cl. 123-447.000.
  - Nicol, Stuart W., 5,462,029, Cl. 123-450.000.
- Lucas-Novasensor: *See—*
  - Koen, Edward F., 5,461,922, Cl. 73-756.000.
- Lucky Limited: *See—*
  - Kim, Yong Z.; Oh, Hun S.; Yeo, Jae H.; Lim, Jong C.; Bang, Chan S.; Kim, Won S.; and Yim, Hyeon J., 5,462,935, Cl. 514-206.000.
- Luder, Ernst: *See—*
  - Glück, Joachim, 5,462,887, Cl. 437-48.000.
- Ludwig Institute for Cancer Research: *See—*
  - Boon-Falleur, Thierry; van der Bruggen, Pierre; De Plaen, Etienne; Lurquin, Christophe; Traversari, Catia; Gaugler, Beatrice; and Van den Eynde, Benoit, 5,462,871, Cl. 435-240.200.
- Lueschow, Kevin J.: *See—*
  - Stratton, Ken L.; Lueschow, Kevin J.; Barton, James C.; and Hayes, Thomas G., 5,462,125, Cl. 172-826.000.
- Luetkens, Melvin L., Jr.: *See—*
  - Lindemann, David C.; Chiang, Weilong L.; Luetkens, Melvin L., Jr.; Pischke, Robert D.; and Schubert, John C., 5,462,794, Cl. 428-317.100.
- Lui, Norbert; Marhold, Albrecht; and Gassen, Karl-Rudolf, to Bayer Aktiengesellschaft. Process for preparing perfluoroalkoxy (alkylthio) benzenes. 5,463,088, Cl. 549-362.000.
- Lui, Norbert; Marhold, Albrecht; and Bielefeldt, Dietmar, to Bayer Aktiengesellschaft. Process for preparing hexafluorobutene. 5,463,150, Cl. 570-157.000.
- Luling, Martin G.: *See—*
  - Bonner, Stephen D.; Rosthal, Richard A.; Bagersh, Abdullah A.; Luling, Martin G.; and Jundt, Jacques A., 5,463,320, Cl. 324-366.000.
- Lumatec Industries, Inc.: *See—*
  - Vandenbelt, Rudy; and Altman, Peter R., 5,463,539, Cl. 362-189.000.
- Luminis Pty Ltd.: *See—*
  - Shaw, Allan; and Luxton, Russell E., 5,461,877, Cl. 62-185.000.
- Lumonics Inc.: *See—*
  - James, Douglas J.; Andrews, Kenneth J.; and McKee, Terrence J., 5,463,200, Cl. 219-121.680.
- Lund, Mark T.: *See—*
  - Stahley, Robert E.; Lund, Mark T.; and Collias, Dimitris I., 5,462,208, Cl. 222-207.000.
- Luo, Ronnier: *See—*
  - MacDonald, Lindsay W.; Johnson, Anthony J.; and Luo, Ronnier, 5,463,480, Cl. 358-520.000.
- Lupo, Andrew, Jr.: *See—*
  - Shih, Neng-Yang; Aslanian, Robert; Lupo, Andrew, Jr.; Piwinski, John J.; Green, Michael J.; and Ganguly, Ashit K., 5,463,074, Cl. 548-314.700.
- Lurquin, Christophe: *See—*
  - Boon-Falleur, Thierry; van der Bruggen, Pierre; De Plaen, Etienne; Lurquin, Christophe; Traversari, Catia; Gaugler, Beatrice; and Van den Eynde, Benoit, 5,462,871, Cl. 435-240.200.
- Lürssen, Klaus: *See—*
  - Fischer, Reiner; Bretschneider, Thomas; Krüger, Bernd-Wieland; Erdelen, Christoph; Santel, Hans-Joachim; Lürssen, Klaus; Schmidt, Robert R.; Wachendorff-Neumann, Ulrike; and Stendel, Wilhelm, 5,462,913, Cl. 504-138.000.
- Luthi, Simon; Kälin, Xavier; Scholz, Wolfgang; and Stüssi, Edgar, to Adidas AG. Midsole for shoe. 5,461,800, Cl. 36-28.000.
- Lutron Electronics, Co., Inc.: *See—*
  - D'Aleo, Michael J.; Ference, Jonathan H.; Hakkarainen, Simo P.; Spira, Joel S.; and Tucker, Darryl W., 5,463,286, Cl. 315-295.000.
- Lutz, Dale R.; MacDougall, Trevor W.; Taylor, William L.; Varner, Wayne F.; and Wandmacher, Robert A., to Minnesota Mining and Manufacturing Company. Faraday-effect sensing coil with stable birefringence. 5,463,312, Cl. 324-96.000.
- Luxton, Russell E.: *See—*
  - Shaw, Allan; and Luxton, Russell E., 5,461,877, Cl. 62-185.000.
- Lyons, Oral G.: *See—*
  - Hager, Robert J.; Gibson, Warren K.; and Lyons, Oral G., 5,463,527, Cl. 361-685.000.
- Lysenko, Zenon; and Pews, Richard G., to Dow Chemical Company, The. Cleaving arylethers. 5,463,129, Cl. 564-423.000.
- Lytle, William B.: *See—*
  - Peek, Gregory A.; Lytle, William B.; and Dyer, John A., 5,462,380, Cl. 403-329.000.
- M&M Precision Systems Corporation: *See—*
  - Royer, Tony A.; and Cowan, Mark, 5,461,797, Cl. 33-501.700.
- Maag Pump Systems AG: *See—*
  - Stehr, Roger; and Boelsterli, Urs, 5,462,420, Cl. 418-83.000.
- Macaulay, John M.; Searson, Peter C.; Duboc, Robert M., Jr.; and Spindt, Christopher J., to Silicon Video Corporation. Fabrication of filamentary field-emission device, including self-aligned gate. 5,462,467, Cl. 445-50.000.
- Macaulay, John M.: *See—*
  - Geis, Michael W.; Macaulay, John M.; and Twichell, Jonathan C., 5,463,271, Cl. 313-346.00R.
- MacDonald, Lindsay W.; Johnson, Anthony J.; and Luo, Ronnier, to Crosfield Electronics Limited. Image processor for output devices which transforms data into acceptable color space. 5,463,480, Cl. 358-520.000.
- MacDonald, Wayne D., to Columbia Industries, Inc. Bowling ball with weight block. 5,462,491, Cl. 473-126.000.
- MacDougall, Trevor W.: *See—*
  - Lutz, Dale R.; MacDougall, Trevor W.; Taylor, William L.; Varner, Wayne F.; and Wandmacher, Robert A., 5,463,312, Cl. 324-96.000.
- Mach, Patrick A., to Minnesota Mining and Manufacturing Company. Conditioned culture medium for rapid growth and detection of microbes. 5,462,860, Cl. 435-34.000.
- Machacek, Zdenek: *See—*
  - Tilman, Paul A.; Scott, Richmond M.; and Machacek, Zdenek, 5,462,360, Cl. 383-63.000.
- Macor Marine Systems International GmbH: *See—*
  - Wendt, Heinz; and Pataj, Bruno, 5,462,002, Cl. 114-260.000.
- Macronix International Co., Ltd.: *See—*
  - Chao, Liang; Lin, Tien-Ler; and Yiu, Tom D., 5,463,586, Cl. 365-210.000.
- Madaus, Paul W.: *See—*
  - Pascucci, Gregory A.; Rasmussen, David E.; Decious, Gaylon M.; Garbe, James R.; Hyzer, Susan M.; Woest, Karen L.; Vairavan, Vairavan; Koch, David L.; Gottschalk, Donald A., Jr.; Burkhardt, Dennis E.; Standish, Darrell E.; Madaus, Paul W.; Spacek, Dan J.;, 5,463,735, Cl. 395-200.100.
- Madduri, Hari H.: *See—*
  - Forman, Ira R.; and Madduri, Hari H., 5,463,733, Cl. 395-182.080.
- Maddux, Larry D., to Cambro Manufacturing Company. Tray and dish cart. 5,462,299, Cl. 280-47.350.
- Madison, Stephen A.: *See—*
  - Batal, David J.; and Madison, Stephen A., 5,463,115, Cl. 562-430.000.
- Maeda, Akira; Sugimura, Yoshikane; Funabashi, Motohisa; Nakano, Toshihiko; Someya, Ryuko; and Kosaka, Michitaka, to Hitachi, Ltd. Learning method and apparatus. 5,463,718, Cl. 395-23.000.
- Maeda, Takashi; Furukido, Takeshi; Hoshino, Kousaku; Udo, Satoru; and Izumi, Masayoshi, to Oiles Corporation. Spherical annular seal with outer sliding layer. 5,462,291, Cl. 277-100.000.
- Maeda, Takeshi: *See—*
  - Kirino, Fumiyoshi; Saito, Atsushi; Toda, Tsuyoshi; Ide, Hiroshi; Tsuchinaga, Hiroyuki; Maeda, Takeshi; and Kugiya, Fumio, 5,463,600, Cl. 369-13.000.
- Maeda, Yoshiaki: *See—*
  - Ogura, Kuniaki; Ishikawa, Hiroyuki; Maeda, Yoshiaki; and Komamura, Kouichi, 5,462,577, Cl. 75-345.000.
- Maejima, Kazuhiro; and Takemata, Toshiharu, to Komori Corporation. Plate mounting apparatus for printing press. 5,461,980, Cl. 101-415.100.
- Maeno, Keiichi: *See—*
  - Takanashi, Itsuo; Nakagaki, Shintaro; Negishi, Ichiro; Suzuki, Tetsuji; Tatsumi, Fujiko; Takahashi, Ryusaku; and Maeno, Keiichi, 5,463,468, Cl. 358-296.000.
- Magee, Phillip D.: *See—*
  - Meisenburg, Gary L.; Eick, Edward C.; Magee, Phillip D.; Mixon, Charles M.; Weronke, Robert B.; Shields, Waylon D.; Smith, Woody R.; and Pavey, Steven J., 5,462,463, Cl. 440-80.000.
- Mageland, Otto M.: *See—*
  - Pascucci, Gregory A.; Rasmussen, David E.; Decious, Gaylon M.; Garbe, James R.; Hyzer, Susan M.; Woest, Karen L.; Vairavan, Vairavan; Koch, David L.; Gottschalk, Donald A., Jr.; Burkhardt, Dennis E.; Standish, Darrell E.; Madaus, Paul W.; Spacek, Dan J.;, 5,463,735, Cl. 395-200.100.
- Mages, Walter J.: *See—*
  - Damm, Klaus; Mages, Walter J.; and Sommer, Wolfgang, 5,462,395, Cl. 411-107.000.
- MagneTek, Inc.: *See—*
  - Van Wagener, Raymond H.; Freimuth, Lothar; and Stein, Michael A., 5,463,522, Cl. 361-103.000.
- Magnetic Revolutions Limited L.L.I.: *See—*
  - Flynn, Charles J., 5,463,263, Cl. 310-181.000.
- Magnin, Bruno: *See—*
  - Grandclement, Charly; and Magnin, Bruno, 5,461,989, Cl. 108-153.000.
- Mahr, Michael J., to Henry Schein, Inc. Dental hand tool clearing shield. 5,462,434, Cl. 433-97.000.
- Maier, Ursula: *See—*
  - Hintermaier, Helmut; Maier, Ursula; and Weiss, Stefan, 5,463,055, Cl. 544-299.000.
- Mailliet, Pierre: *See—*
  - Benck, Jean; and Mailliet, Pierre, 5,462,433, Cl. 432-99.000.
- Makado, Shoichi: *See—*
  - Fukano, Yoshihiro; Makado, Shoichi; and Arakawa, Takeshi, 5,462,087, Cl. 137-884.000.
- Maki, Hidetaka: *See—*
  - Hasegawa, Yusuke; and Maki, Hidetaka, 5,462,037, Cl. 123-673.000.
- Makita, Takeshi; Sugiura, Susumu; and Yamada, Osamu, to Canon Kabushiki Kaisha. Image processing method and apparatus. 5,463,478, Cl. 358-455.000.
- Malek, Joseph H.: *See—*
  - Hereford, Cliff E., deceased; and Malek, Joseph H., 5,462,176, Cl. 209-577.000.
- Malik, Aslam A.: *See—*
  - Manser, Gerald E.; Malik, Aslam A.; and Archibald, Thomas G., 5,463,019, Cl. 528-402.000.
- Malim, Michael H.: *See—*
  - Kingsman, Alan J.; Kingsman, Susan M.; Adams, Sally E.; Mellor, Elizabeth J. C.; and Malim, Michael H., 5,463,024, Cl. 530-350.000.

- Malinowski, Alan E.: *See—*
  - Vaios, Christos I.; Malinowski, Alan E.; and Diliani, Dimitri N., 5,463,681, Cl. 379-189.000.
- Malleron, Jean-Luc: *See—*
  - Achard, Daniel; Grisoni, Serge; Malleron, Jean-Luc; Peyronel, Jean-Francois; and Tabart, Michel, 5,463,077, Cl. 548-515.000.
- Malouvier, Dominique; Müller, Peter; and Sebastiani, Oscar, to Muller, Peter; and Sebastiani, Oscar. Method of analyzing the functioning of the lungs. 5,462,061, Cl. 128-720.000.
- Mamiya, Kiyotaka; Imada, Michihiro; and Morimasa, Takanobu, to Mazda Motor Corporation. Air-fuel ratio control system for internal combustion engine. 5,462,039, Cl. 123-686.000.
- Mamyshev, Pavel V.; and Mollenauer, Linn F., to AT&T Corp. Soliton transmission system having sliding-frequency guiding filters with particular filter strengths and sliding rates. 5,463,489, Cl. 359-173.000.
- Man Gutehoffnungshutte Aktiengesellschaft: *See—*
  - Guido, Heinz, 5,462,259, Cl. 266-45.000.
- MAN Roland Druckmaschinen AG: *See—*
  - Thuer, Walter, 5,462,165, Cl. 206-410.000.
- Man, Susan K.: *See—*
  - Fisher, Gregory M.; Cebulka, Kathleen D.; Man, Susan K.; Nazif, Zaher A.; and Vinciguerra, Lori J., 5,463,682, Cl. 379-201.000.
- Mandel, Barry P.; Resto, Suzzette S.; Rizzolo, Charles D.; Green, Frederick A.; Van Dongen, Richard A.; and Billings, Phillip A., to Xerox Corporation. Variable force sheets or set ejector. 5,462,265, Cl. 270-53.000.
- Mann, Donaerl B., to D'Mannco, Inc. Knee brace having an inflatable bladder support. 5,462,517, Cl. 602-26.000.
- Mannesmann Aktiengesellschaft: *See—*
  - Gersemsky, Udo, 5,461,985, Cl. 105-30.000.
  - Von Hagen, Ingo; Popperling, Rolf; Schlerkmann, Hubertus; and Zeislmair, Ulrike, 5,462,615, Cl. 148-592.000.
  - Wenzel, Harald, 5,461,861, Cl. 60-618.000.
- Mannesmann Kienzle GmbH: *See—*
  - Widl, Gerhard; and Fichter, Manfred, 5,463,373, Cl. 340-441.000.
- Mano, Hiroshi: *See—*
  - Yamada, Hiromichi; Ohkubo, Masaharu; Ojima, Masaki; Sasame, Hiroshi; Kawana, Takashi; Seto, Kaoru; Mano, Hiroshi; Saito, Tetsuo; Kashihara, Atsushi; and Ito, Michio, 5,463,473, Cl. 358-300.000.
- Manring, Lewis E.; and West, Michael W. J., to Du Pont de Nemours, E. I., and Company. Esterification of carboxylate containing polymers. 5,463,182, Cl. 525-330.400.
- Mansdoerfer, Richard L., Jr.: *See—*
  - Bash, Stephan R.; Di Rubbo, Salvatore R. L.; Gibilisco, Paul F.; and Mansdoerfer, Richard L., Jr., 5,463,677, Cl. 379-88.000.
- Manser, Gerald E.; Malik, Aslam A.; and Archibald, Thomas G., to Aerojet-General Corporation. Polymers and copolymers from 3-azidomethyl-3-nitratomethyloxetane. 5,463,019, Cl. 528-402.000.
- Manusch, Cristoph; Obersteller, Udo; and Klaassen, Willem, to Pritt Produktionsgesellschaft mbH. Applicator-roller assembly for tape dispenser. 5,462,633, Cl. 156-577.000.
- Maor, Yasmin: *See—*
  - Aderka, Dan; Maor, Yasmin; Wallach, David; and Revel, Michel, 5,462,731, Cl. 424-85.200.
- Marathon Oil Company: *See—*
  - Sydansk, Robert D., 5,462,390, Cl. 405-264.000.
- Marbot, Roland, to Bull, S.A. Adjustable delay circuit of current intensity having delay as a hyperbolic function. 5,463,343, Cl. 327-270.000.
- Marcangelo, Steven. Edge guiding apparatus for sewing machines. 5,461,999, Cl. 112-306.000.
- Marchand, Pierre: *See—*
  - Delfort, Bruno; Daqudal, Bertrand; Lallement, Jacques; Born, Maurice; Marchand, Pierre; and Hipeaux, Jean-Claude, 5,462,682, Cl. 252-18.000.
- Marconi Instruments Limited: *See—*
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- Marcus, Bonita K.: *See—*
  - Resasco, Daniel E.; Marcus, Bonita K.; Huang, Chen-Shi; and Durante, Vincent A., 5,462,904, Cl. 502-222.000.
- Marek, Jiri; Schubert, Dietrich; Baumann, Helmut; Muenzel, Horst; Offenberg, Michael; and Willmann, Martin, to Robert Bosch GmbH. Acceleration sensor. 5,461,917, Cl. 73-514.160.
- Marhold, Albrecht: *See—*
  - Lui, Norbert; Marhold, Albrecht; and Gassen, Karl-Rudolf, 5,463,088, Cl. 549-362.000.
  - Lui, Norbert; Marhold, Albrecht; and Bielefeldt, Dietmar, 5,463,150, Cl. 570-157.000.
- Marhold, Harald: *See—*
  - Kos, Bernd; and Marhold, Harald, 5,462,578, Cl. 75-404.000.
- Markland, Max C., to Joshua Group Ltd. Lateral movement trainer selectively positionable for storage or use. 5,462,506, Cl. 482-51.000.
- Marko, Paul D.; Wadin, Craig P.; and Brown, David L., to Motorola, Inc. Nested digital phase lock loop. 5,463,351, Cl. 331-1.00A.
- Markowitz, Arthur D.; and Sabo, John J., to New York Mercantile Exchange. Portable trade recordation system including means for abbreviated entry of data. 5,463,547, Cl. 364-408.000.
- Marks, John W. G.; and Yates, Simon J., to Chemring Limited. Dispenser. 5,461,960, Cl. 89-1.510.
- Markusch, Peter H.; and Rosthauser, James W., to Bayer Corporation. Polyurethane carpet backing process based on polymeric MDI quasi-prepolymers. 5,462,766, Cl. 427-244.000.
- Marlow, John V.: *See—*
  - Vincze, Albert M.; Seymour, Theodore J.; Culkeen, Patrick; Tang, Nai-Yong; Lewis, Gerald P.; Niessen, Paul; and Marlow, John V., 5,462,109, Cl. 164-479.000.
- Marrucci, Paolo; Sgarzi, Germano; and Vitale, Fabio, to Alenia Aeritalia & Selenia S.p.A. Preprocessor for detection of punctiform sources in infrared scenarios. 5,463,566, Cl. 364-516.000.
- Mars, Incorporated: *See—*
  - Furneaux, David M., 5,462,151, Cl. 194-318.000.
  - Waine, Peter J.; and Campbell, Bernard J., 5,462,149, Cl. 194-206.000.
- Marsh, Michael J. C.; and Hodson, Trevor M., to CSIR. Telecommunications network having a distributed network of decentralized local stations. 5,463,671, Cl. 379-56.000.
- Marshall, Jill A.: *See—*
  - Young, David T.; Marshall, Jill A.; Schweikert, Emile A.; and Park, Melvin A., 5,463,220, Cl. 250-288.000.
- Marti, Hans-Rudolf, to A. & J. Stockli AG. Device for mounting a handle to a pan body. 5,462,195, Cl. 220-752.000.
- Martin, David R.: *See—*
  - Hoff, Richard W.; and Martin, David R., 5,462,405, Cl. 416-97.00R.
- Martin, Juan F.: *See—*
  - Groenen, Martinus A. M.; Veenstra, Annemarie E.; Van Solingen, Pieter; Koekman, Bertus P.; Van Der Voort, Lucia H. M.; Martin, Juan F.; Gutierrez, Santiago; Diez, Bruno; Alvarez, Emilio; Barredo, Jose L.; and Esmahan, Christina, 5,462,862, Cl. 435-69.100.
- Martin Marietta Corporation: *See—*
  - Langan, Timothy J.; Pickens, Joseph R.; Heubaum, Frank H.; and Kramer, Lawrence S., 5,462,712, Cl. 420-528.000.
- Martin, Roy: *See—*
  - Kane, James; Martin, Roy; and Schilling, Anne, 5,462,880, Cl. 436-138.000.
- Martinez, Jose, Jr.; and Joyce, Michael P. Toothbrush. 5,462,377, Cl. 401-185.000.
- Martinez, Serge: *See—*
  - Barth, Francis; Casellas, Pierre; Congy, Christian; Martinez, Serge; and Rinaldi, Murielle, 5,462,960, Cl. 514-406.000.
- Marubeni Tubulars, Inc.: *See—*
  - Klementich, Erich F., 5,462,315, Cl. 285-24.000.
- Maruyama, Akira, to Seiko Epson Corporation. Nonvolatile semiconductor system. 5,463,587, Cl. 365-210.000.
- Maruyama, Takumi; Onodera, Takashi; Hatakenaka, Nobuko; Uno, Hiroaki; and Yokoshi, Noriyuki, to Fujitsu Limited. Controlling synchronization in a system having a plurality of units when a unit is disconnected from or connected to the system that is active. 5,463,663, Cl. 375-356.000.
- Marvy, Alain A., to Cigar Lake Mining Corporation. Waste disposal process. 5,463,172, Cl. 588-252.000.
- Mas, Janet L.: *See—*
  - Hou, Donald; Draper, Richard W.; Lee, Gary M.; Mas, Janet L.; and Mergelsberg, Ingrid, 5,463,051, Cl. 540-576.000.
- Masamichi, Kaneko: *See—*
  - Isao, Kiba; and Masamichi, Kaneko, 5,462,233, Cl. 241-18.000.
- Maschinenfabrik Rieter AG: *See—*
  - Klee, Werner; and Gisel, Thomas, 5,462,239, Cl. 242-18.00R.
- Mashimo, Kiyokazu: *See—*
  - Nukada, Katsumi; Imai, Akira; Daimon, Katsumi; Iijima, Masakazu; Mashimo, Kiyokazu; Sakaguchi, Yasuo; and Takegawa, Ichiro, 5,463,043, Cl. 540-141.000.
- Masiero, Antonio: *See—*
  - Cuzzato, Paolo; and Masiero, Antonio, 5,463,151, Cl. 570-166.000.
- Massachusetts Institute of Technology: *See—*
  - Geis, Michael W.; Macaulay, John M.; and Twichell, Jonathan C., 5,463,271, Cl. 313-346.00R.
- Massara, James M.; and Davis, Glenn A., to Scientific-Atlanta, Inc. Apparatus and method for controlling distribution of electrical energy to a space conditioning load. 5,462,225, Cl. 236-47.000.
- Massarelli, Lynn: *See—*
  - Sounik, James R.; Wilkison, William W., III; Russ, Keith M.; and Massarelli, Lynn, 5,463,108, Cl. 560-130.000.
- Mastri, Dominick L.: *See—*
  - Kolesa, Michael S.; Mastri, Dominick L.; Young, Wayne P.; and Bolanos, Henry, 5,462,558, Cl. 606-139.000.
- Mastroyiannis, Mihalis: *See—*
  - van Steenbrugge, Bernard; de Leeuw, Henricus; and Mastroyiannis, Mihalis, 5,463,619, Cl. 370-58.100.
- Masuda, Mitsuo; and Fujii, Hiroshi, to Yamakawa Industrial Co., Ltd. Bumper reinforcement and manufacturing method therefor. 5,462,325, Cl. 293-102.000.
- Masuda, Yukihiro: *See—*
  - Deguchi, Hiroaki; Yamashita, Masahiro; and Masuda, Yukihiro, 5,463,421, Cl. 348-296.000.
- Masumi, Taizo, to University of Tokyo, The. Superconductive optoelectronic devices with the basic substance Bi_2O_3 of superconductive-conjugate photoconductivity. 5,462,916, Cl. 505-182.000.
- Masumoto, Katuhisa; Nagatomi, Toshio; Nakamura, Akihiko; and Yamada, Yoshimi, to Sumitomo Chemical Company, Limited. Process of producing 2-iminothiazoline derivatives and process of producing their intermediates. 5,463,069, Cl. 548-190.000.
- Masumoto, Yasuhiro; and Shimada, Isao, to Sailor Pen Co., Ltd. Applicator having cap which pressurizes and seals inner space. 5,462,379, Cl. 401-213.000.

Matai, Masahiro, to NEC Corporation. Paging receiver having a speaker and an LED alternatively driven on receiving a call. 5,463,380, Cl. 340-825.440.
Mathes, Gene R.: *See*—
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Mathews, Roger A.: *See*—
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Matsuba Electric Manufacturing Co., Ltd.: *See*—
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Matsubara, Kunihiro: *See*—
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Matsuda, Hiroto, to Canon Kabushiki Kaisha. Liquid jet recording head with multiple liquid chambers. 5,463,412, Cl. 347-43.000.
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Matsuda, Shinpei: *See*—
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Matsuda, Takehisa; Moghaddam, Minoo J.; and Sakurai, Katsukiyo, to Seikagaku Kogyo Kabushiki Kaisha. Photocurable glycosaminoglycan derivatives, crosslinked glycosaminoglycans and method of production thereof. 5,462,976, Cl. 522-74.000.
Matsuda, Yoshio: *See*—
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Matsuhisa, Yoji: *See*—
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Matsui, Tomoji, to NEC Corporation. Motor control device. 5,463,293, Cl. 318-285.000.
Matsuishi, Tsugumi; Hori, Toshihiko; and Suda, Shinji, to Mitsubishi Denki Kabushiki Kaisha. Microcomputer, program development apparatus, and program development system. 5,463,738, Cl. 395-823.000.
Matsuki, Masaya: *See*—
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Matsuki, Masuo; and Ikesue, Haruyuki, to NSK Ltd. Gas generator. 5,461,983, Cl. 102-530.000.
Matsuki, Sadao; Motogi, Moriyuki; Nabeshima, Keitaro; and Kadowaki, Minoru, to Toray Industries, Inc. Combined and multi-component false-twist textured filament yarn, production method thereof, and knitted/woven fabric using the yarn. 5,462,790, Cl. 428-229.000.
Matsumoto, Jiro; and Yanagisawa, Ikuo, to Nippon Light Metal Co., Ltd. Electrically heatable caulking system and method. 5,461,768, Cl. 29-509.000.
Matsumoto, Koji: *See*—
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Matsunaga, Kazuki: *See*—
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Matsunami, Mitsuo, to Sharp Kabushiki Kaisha. Large scale high density semiconductor apparatus. 5,463,246, Cl. 257-621.000.
Matsuo, Kozo: *See*—
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Matsuo, Shinpei: *See*—
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Matsuoka, Akihiko; Ohnishi, Hiroshi; Kunieda, Yoshinori; Misaizu, Kouei; and Yamamoto, Yuuri, to Matsushita Electric Industrial Co., Ltd. Frame synchronizing apparatus for quadrature modulation data communication radio receiver. 5,463,627, Cl. 370-105.100.
Matsuoka, Akio: *See*—
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Matsuoka, Fumitomo; and Ikeda, Naoki, to Kabushiki Kaisha Toshiba. Method of making a semiconductor device with sidewall etch stopper and wide through-hole having multilayered wiring structure. 5,462,893, Cl. 437-195.000.
Matsuoka, Kazuhiko: *See*—
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Matsushima, Kiyomitsu; Odake, Hidekazu; Ohashi, Tamotsu; and Tsukada, Isamu, to Yoshida Kogyo K.K. Slat for transporting device for extruded articles of aluminum or aluminum alloy. 5,462,154, Cl. 198-699.000.
Matsushima, Yoshimasa; and Hagiwara, Toshimitsu, to Takasago International Corporation. 1,4-bis(4,4-diphenyl-1,3-butadienyl)benzene derivative and electrophotographic photoreceptor using the same. 5,463,128, Cl. 564-452.000.
Matsushita Electric Corporation of America: *See*—
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Matsushita Electric Industrial Co., Ltd.: *See*—
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Matsuzaki, Kazuo; and Amano, Akira, to Fuji Electric Co., Ltd. Electromagnetic wave detecting apparatus. 5,463,226, Cl. 250-374.000.
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- Maxtor Corporation: *See—*
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- Maxwell, Thomas P.: *See—*
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- Mayo, Stephen M.: *See—*
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- Maytag Corporation: *See—*
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- Mazda Motor Corporation: *See—*
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  - Minami, Takanori; Shiraishi, Noriaki; Shimizu, Tsutomu; Takamuku, Kenji; Tsushio, Yoshinori; Mizushima, Yoshio; Yoshimoto, Kazuyuki; and Kadokura, Masaki, 5,462,021, Cl. 123-3.000.
- Mazzola, Anthony H. Air coil. 5,461,813, Cl. 42-74.000.
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- McAneney, Brian: *See—*
  - Moffat, Karen A.; Pontes, Fatima M.; Paine, Anthony J.; McAneney, Brian; and Puri, Paul, 5,462,828, Cl. 430-106.000.
- McCann, James D.; and Mullins, Randal L., to Scitex Digital Printing, Inc. Four inch print engine module. 5,463,415, Cl. 347-74.000.
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- McCarthy, John G.: *See—*
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- McClellan, John T.: *See—*
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- McDugle, Woodrow G.: *See—*
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- McEntee, Jarlath: *See—*
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- McEwen, J. C.: *See—*
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- McFadden, Gordon M.: *See—*
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- McFarland, Michael J.: *See—*
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- McGaw, Inc.: *See—*
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- McGinley, Emanuel J.; and Tuason, Domingo C., Jr., to FMC Corporation. Microcrystalline cellulose and glucomannan aggregates. 5,462,761, Cl. 426-573.000.
- McGinniss, Vincent D.; Bunk, Albert R.; and Mikuni, Hiroyuki, to Three Bond Company, Ltd. Electrically-conductive and ionically-conductive polymeric networks and their preparation. 5,462,696, Cl. 252-500.000.
- McGlamery, Gerald G.: *See—*
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- McGlothin, Clayton E. Emergency warning flag systems. 5,462,004, Cl. 116-63.00R.
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- McGrath, Donald T.: *See—*
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- McGregor, Gavin, to National Research Council of Canada. Method of manufacturing electrically conductive elements particularly EDM or ECM electrodes. 5,461,769, Cl. 29-527.400.
- McGrew, Gordon N.: *See—*
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- McGuire, Kenneth J.: *See—*
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- McKee, Eric. Lifting device for a cover and seat on a bowl of a toilet. 5,461,733, Cl. 4-246.100.
- McKee, Terrence J.: *See—*
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- McKillip, John J., to Stack, Jr., Stanley. Integrated card and business form assembly and method for fabricating same on label formation equipment. 5,462,488, Cl. 462-26.000.
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- McLean, Donald A.: *See—*
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- McMillan, James S.; and Tarsha, Simon, to Pipe Rehab International, Inc. Method for forming a flange on an end of a synthetic liner. 5,462,706, Cl. 264-138.000.
- McMillan, Larry D.: *See—*
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- McMillan, Stewart G.; and Kolacz, David J., to Task Force Tips, Inc. Monitor with safety valve. 5,462,228, Cl. 239-285.000.
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- McNeil-PPC, Inc.: *See—*
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- McNell-PPC, Inc.: *See—*
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- McTaggart, Fergus; Pemberton, Denis; and Smith, Graham J., to Imperial Chemical Industries PLC. Cross-linked quaternary ammonium derivatives of poly(N, N-dialkylallyl) ammonium polymers. 5,462,730, Cl. 424-78.350.
- McVey, John B.: *See—*
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- MDS Health Group Limited: *See—*
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  - Fernandez, Jose M.; and Meadows, Vernon, 5,462,814, Cl. 429-7.000.
- Mediolanum Farmaceutici S.p.A.: *See—*
  - Ferruti, Paolo; Ranucci, Elisabetta; and Bignotti, Fabio, 5,463,012, Cl. 528-196.000.
- Medipro Sciences Limited: *See—*
  - Turner, Josephine S.; Murray, D. Gary; Zuccolin, John D.; and Li, Ruey S., 5,462,743, Cl. 424-448.000.
- Mehaffey, James D.: *See—*
  - Kirkpatrick, Paul A.; and Mehaffey, James D., 5,463,559, Cl. 364-483.000.
- Mehnert, David W., to Kraft Foods, Inc. Flavor enhancement in cultured dairy products. 5,462,755, Cl. 426-36.000.
- Mehra, Yuv R.: *See—*
  - Wood, Glenn C.; and Mehra, Yuv R., 5,462,583, Cl. 95-192.000.
- Meier, Jacques, to Ferag AG. Process and apparatus for opening folded printed products. 5,462,266, Cl. 270-54.000.
- Meijer, Jean-Pierre: *See—*
  - Ward, Dennis M.; Aerts, Ronny A. W.; Meijer, Jean-Pierre; Arnswald, Silke; Sandoval, Gerald A.; and Schneemann, Herbert, 5,463,555, Cl. 364-468.000.
- Meinecke, Errol L.: *See—*
  - Farley, Scott A.; and Meinecke, Errol L., 5,462,487, Cl. 460-105.000.
- Meinfelder, Horst: *See—*
  - Demar, Adelbert; Ebner, Wolfgang; Meinfelder, Horst; and Köberlein, Josef, 5,462,155, Cl. 198-760.000.
- Meisenburg, Gary L.; Eick, Edward C.; Magee, Phillip D.; Mixon, Charles M.; Weronke, Robert B.; Shields, Waylon D.; Smith, Woody R.; and Pavey, Steven J., to Brunswick Corporation. Marine dual propeller lower bore drive assembly. 5,462,463, Cl. 440-80.000.
- Meisterling, Jesse R., to Raymond Engineering Inc. Acoustic transducer, transducerized fastener and method of manufacture. 5,461,923, Cl. 73-761.000.
- Meki, Naoto; Imahase, Tomotoshi; Nishida, Kazue; Fujimoto, Hiroaki; Mikitani, Kenichi; Takano, Hirotaka; Ogasawara, Yoriko; and Tamaki, Masahiro, to Sumitomo Chemical Company, Limited. Pyrazole oxime derivatives, compositions and use. 5,462,961, Cl. 514-407.000.
- Mellor, Elizabeth J. C.: *See—*
  - Kingsman, Alan J.; Kingsman, Susan M.; Adams, Sally E.; Mellor, Elizabeth J. C.; and Malim, Michael H., 5,463,024, Cl. 530-350.000.
- Melville, Kenneth B. Self centering pipe axis laser guide. 5,461,793, Cl. 33-286.000.
- Mendez, Victor; and Hawes, Kevin J., to Delco Electronics Corporation. Method and apparatus for tire pressure monitoring and for shared keyless entry control. 5,463,374, Cl. 340-442.000.

- Mendia, Jose I. I.; and Urruela, Jose R., to Sener, Ingenieria Y Sistemas, S.A. Divergent slave petal for sealing in variable geometry exhaust nozzles for gas turbine propulsion units. 5,461,856, Cl. 60-230.000.
- Mennen Company, The: *See*—
  - Rech, Dawn M.; and Barr, Morton L., 5,462,736, Cl. 424-401.000.
- Menzel, Karl-Heinz: *See*—
  - Sassmannshausen, Werner; Menzel, Karl-Heinz; Sassmannshausen, Werner; Schreiber, Stefan; Kleindienst, Anke; and Günther, Hubert, 5,461,959, Cl. 84-421.000.
- Merbach, Lothar, to Rowenta-Werke GmbH. Dental device attachable to an electric toothbrush drive. 5,461,744, Cl. 15-22.100.
- Mercer, Melissa J.: *See*—
  - Slavicek, James M.; and Mercer, Melissa J., 5,462,732, Cl. 424-93.200.
- Merchant, Zaffer S.: *See*—
  - Nikas, Dimitrios; and Merchant, Zaffer S., 5,463,382, Cl. 340-825.440.
- Merck & Co., Inc.: *See*—
  - Askin, David; Eng, Kan K.; and Volante, Ralph P., .5,463,067, Cl. 548-113.000.
  - Brenner, Gerald S.; Katdare, Ashok V.; Pretzer, Denise; and Whiteford, Donna T., 5,462,932, Cl. 514-108.000.
- Mergelsberg, Ingrid: *See*—
  - Hou, Donald; Draper, Richard W.; Lee, Gary M.; Mas, Janet L.; and Mergelsberg, Ingrid, 5,463,051, Cl. 540-576.000.
- Merkel, Paul B.; and Singer, Stephen P., to Eastman Kodak Company. Color photographic materials including magenta coupler, inhibitor-releasing coupler and carbonamide compound, and methods. 5,462,848, Cl. 430-546.000.
- Merrell Dow Pharmaceuticals Inc.: *See*—
  - Stemerick, David M., 5,463,181, Cl. 514-125.000.
- Merrill, Warren R., Jr.; and Taylor-Merrill, Jacqueline M. Step ladder stabilizer. 5,462,133, Cl. 182-172.000.
- Merritt, Carleton G.: *See*—
  - Ventres, Romeo J.; Matuszak, Edward A.; and Merritt, Carleton G., 5,462,758, Cl. 426-557.000.
- Messina, Frank D., to AT&T IPM Corp. Undersea cable burial plowshare and sled apparatus. 5,462,389, Cl. 405-183.000.
- Mestetsky, Pat A.; and Davis, Robert E., to United Laboratories, Inc. Method of cleaning using a foamed liquid. 5,462,607, Cl. 134-22.120.
- Metapro: *See*—
  - Kim, John Y., 5,461,799, Cl. 36-7.200.
- Metroka, Michael P.: *See*—
  - Dillon, Thomas M.; Krolopp, Robert K.; and Metroka, Michael P., 5,463,646, Cl. 371-69.100.
- Mette, Manfred. Apparatus and method for homogeneous mixing of fluid components to form a mixed product having a more accurately set mixture ratio. 5,462,352, Cl. 366-131.000.
- Metzger, Albert: *See*—
  - Guardiola, Pierre-Henri; Iv, Van-Tha; Metzger, Albert; Cleon, Louis-Marie; and Dannawi, Marwan, 5,462,144, Cl. 188-377.000.
- Meunier, Robert: *See*—
  - Nedderman, William H., Jr.; and Meunier, Robert, 5,462,000, Cl. 114-249.000.
- Meyer, Burton C.: *See*—
  - O'Patka, Dennis J.; Williamson, Craig C.; Meyer, Burton C.; and Wildman, John R., 5,462,285, Cl. 273-459.000.
- Meyer, Fernand, to Association pour la Recherche et le Development des Methodes et Processus Industriels (Armines). Method for the processing of images by hierarchically organized queues. 5,463,698, Cl. 382-276.000.
- Meyer, Karen M.: *See*—
  - Covert, Charles H.; Wagner, Richard W.; Turner, Kenneth W.; and Meyer, Karen M., 5,462,100, Cl. 141-59.000.
- Meyerson, Bernard S.: *See*—
  - Dennard, Robert H.; Meyerson, Bernard S.; and Rosenberg, Robert, 5,462,883, Cl. 437-21.000.
- Mezger, Frans K.: *See*—
  - Lehrieder, Erwin P. J.; and Mezger, Frans K., 5,461,851, Cl. 59-4.000.
- Michael, Daryl A.: *See*—
  - Ellingson, David I.; Michael, Daryl A.; and Nelms, William M., 5,462,348, Cl. 312-301.000.
- Michaels, John H.: *See*—
  - Bolton, Theodore S.; and Michaels, John H., 5,461,879, Cl. 62-280.000.
- Michal, Vratislav M., to Eastman Kodak Company. Assemblage and method for relieving overpressure in an enclosure. 5,461,831, Cl. 52-1.000.
- Mickelson, James R.: *See*—
  - Campbell, Kevin P.; Knudson, C. Michael; Kahl, Steven D.; Louis, Charles F.; and Mickelson, James R., 5,462,857, Cl. 435-7.210.
- Microelectronics and Computer Technology Corporation: *See*—
  - Simmons, Richard L.; and Bertram, Michael J., 5,462,217, Cl. 228-180.220.
- Microlog Corporation: *See*—
  - Morduch, Georg E.; Parkinson, Alvin O.; and Urso, Thomas S., Jr., 5,463,684, Cl. 379-202.000.
- Microsoft Corporation: *See*—
  - Chou, Daniel S., 5,463,471, Cl. 358-298.000.
- Midavaine, John C.: *See*—
  - Bailey, Richard A.; and Midavaine, John C., 5,462,468, Cl. 445-59.000.
- Midwest Research Institute: *See*—
  - Bhattacharya, Raghu N.; and Ginley, David S., 5,462,647, Cl. 205-74.000.
- Mieloszynski, Jean-Luc: *See*—
  - Born, Maurice; Aberkane, Ourida; Mieloszynski, Jean-Luc; Paquer, Daniel; and Parc, Guy, 5,463,132, Cl. 568-22.000.
- Miess, Georg-Emerich; Roth, Peter M.; Heinrich, Karl; and Rewitzer, Siegfried, to Hoechst Aktiengesellschaft. Method for reprocessing solvent mixtures containing constituents of low volatility and apparatus suitable therefor. 5,462,643, Cl. 203-72.000.
- Mifune, Hideo: *See*—
  - Nitta, Tomio; Mifune, Hideo; Seki, Masato; Kaga, Yosimitu; and Serizawa, Noriyuki, 5,462,044, Cl. 126-262.000.
- Mikitani, Kenichi: *See*—
  - Meki, Naoto; Imahase, Tomotoshi; Nishida, Kazue; Fujimoto, Hiroaki; Mikitani, Kenichi; Takano, Hirotaka; Ogasawara, Yoriko; and Tamaki, Masahiro, 5,462,961, Cl. 514-407.000.
- Mikol, Erwin F.: *See*—
  - Loschelder, Todd C.; and Mikol, Erwin F., 5,462,079, Cl. 137-216.000.
- Mikoshiba, Yoshihisa; Adachi, Teruhiko; and Tajiri, Kouji, to Teijin Limited. Polyamide hollow and/or non-circular fiber and process for making same. 5,462,802, Cl. 428-376.000.
- Mikuni, Hiroyuki: *See*—
  - McGinniss, Vincent D.; Bunk, Albert R.; and Mikuni, Hiroyuki, 5,462,696, Cl. 252-500.000.
- Miles Inc.: *See*—
  - Schwimmer, Alan F., 5,462,198, Cl. 221-130.000.
- Miller, Allen D.: *See*—
  - Demarest, Scott W.; Corba, Robert E.; Miller, Allen D.; Fritz, John M.; and Shanklin, Donald J., 5,462,099, Cl. 141-3.000.
- Miller, Michael R.: *See*—
  - Rea, Perry J.; Miller, Michael R.; Iler, Gary T.; and Stevens, William E., 5,462,313, Cl. 285-21.000.
- Miller, Paul D.: *See*—
  - Roth, Richard; Miller, Paul D.; and Plumb, William L., 5,462,159, Cl. 206-310.000.
- Miller, Stanley H.: *See*—
  - Skarda, Louis J.; Miller, Stanley H.; and McCullough, Timothy L., 5,463,261, Cl. 307-131.000.
- Miller, Stephen C.: *See*—
  - Dietz, Terry L.; and Miller, Stephen C., 5,462,550, Cl. 606-86.000.
- Miller, Ted. Lock blade knife. 5,461,786, Cl. 30-161.000.
- Millios, William L.; and Schulz, David E., to AT&T Corp. Relaying of messages between hearing impaired callers using keyboards and other callers. 5,463,665, Cl. 379-52.000.
- Mills, Daniel M.: *See*—
  - Chandrasekaran, Kugalur S.; Mills, Daniel M.; and Ogletree, Richard, 5,462,364, Cl. 384-111.000.
- Milstein, Yakov: *See*—
  - Wertheizer, Gideon; Be'ery Yair; Ovadia, Bat-Sheva; Gross, Yael; Perets, Ronen; and Milstein, Yakov, 5,463,749, Cl. 395-437.000.
- Milunas, Rimas S., to Saturn Corporation. Integrated traction control system. 5,463,551, Cl. 364-426.020.
- Mimura, Yoshiaki: *See*—
  - Isogai, Naoki; Mimura, Yoshiaki; and Fujieda, Masanao, 5,463,430, Cl. 351-208.000.
- Minagawa, Gary A.: *See*—
  - Pozniakas, Robert S.; and Minagawa, Gary A., 5,463,455, Cl. 355-299.000.
- Minami, Takanori; Shiraishi, Noriaki; Shimizu, Tsutomu; Takamuku, Kenji; Tsushio, Yoshinori; Mizushima, Yoshio; Yoshimoto, Kazuyuki; and Kadokura, Masaki, to Mazda Motor Corporation. Hydrogen gas supply systems for hydrogen engine and method of supplying hydrogen gas to the hydrogen gas supply system. 5,462,021, Cl. 123-3.000.
- Minarelli, Alessandro: *See*—
  - Boriani, Silvano; and Minarelli, Alessandro, 5,461,954, Cl. 83-49.000.
- Mine Safety Appliances Company: *See*—
  - Burkhardt, Elizabeth R., 5,463,131, Cl. 568-1.000.
- Ming, Lam H., to Outboard Marine Corporation. Outboard motor with oil sump cooling arrangement. 5,462,464, Cl. 440-88.000.
- Minick, Steven E.; Lawless, Michael W.; Soberon, Peter A.; Kaul, Ashok; and Hermann, Robert A., to Abbott Laboratories. Push button flow stop useable with a disposable infusion pumping chamber cassette. 5,462,256, Cl. 251-331.000.
- Minigrip, Inc.: *See*—
  - Tilman, Paul A.; Scott, Richmond M.; and Machacek, Zdenek, 5,462,360, Cl. 383-63.000.
- MiniMed, Inc., a Delaware corporation: *See*—
  - Srisathapat, Chad; and Yates, Paul A., 5,462,525, Cl. 604-67.000.
- Minneapolis Mining and Manufacturing Company: *See*—
  - Williams, Jerry W.; DeVoe, Robert J.; Klun, Thomas P.; Vesley, George F.; and Zimmerman, Patrick G., 5,462,797, Cl. 428-345.000.
- Minnesota Mining and Manufacturing: *See*—
  - Jubran, Nusrallah, 5,462,597, Cl. 118-31.500.
- Minnesota Mining and Manufacturing Company: *See*—
  - Adkins, Ronald R.; Fabbrini, Charles J.; and Strand, Neal T., 5,462,768, Cl. 427-265.000.
  - Ahlberg, Carl S.; Wilson, James A.; and Harrison, James R., 5,461,749, Cl. 15-228.000.
  - Bentsen, James G., 5,462,879, Cl. 436-136.000.
  - Calhoun, Clyde D.; and Kessel, Carl R., 5,462,765, Cl. 427-198.000.
  - Campbell, Jeffrey D.; and Gearing, Graham O., 5,463,379, Cl. 340-657.000.
  - Evans, Christopher M.; Buckingham, Mark R.; and Norman, Colin F., 5,462,823, Cl. 430-14.000.

Gehrich, John L.; Maxwell, Thomas P.; Hacker, Thomas G.; and Holody, Mark Z., 5,462,052, Cl. 128-632.000.
Lutz, Dale R.; MacDougall, Trevor W.; Taylor, William L.; Varner, Wayne F.; and Wandmacher, Robert A., 5,463,312, Cl. 324-96.000.
Mach, Patrick A., 5,462,860, Cl. 435-34.000.
Portelli, Gene B.; Schultz, William J.; Boden, John T.; and Kaufer, Daniel M., 5,462,996, Cl. 525-423.000.
Shearer, John R.; and Shelley, Philip, 5,462,563, Cl. 623-18.000.
Skarda, Louis J.; Miller, Stanley H.; and McCullough, Timothy L., 5,463,261, Cl. 307-131.000.
Swenson, Douglas A.; Fox, Herbert J.; Krueger, Dennis L.; and Lockridge, Rochelle L., 5,462,708, Cl. 264-174.110.
Woodson, Lewis P., 5,462,644, Cl. 204-131.000.
Minolta Camera Kabushiki Kaisha: *See—*
Shintani, Dai; Okada, Hiroyuki; Hoda, Takeo; Izumi, Shuji; Mukai, Hiromu; Hatamori, Osamu; and Tsuji, Sadafusa, 5,463,436, Cl. 354-81.000.
Minolta Co., Ltd.: *See—*
Hori, Haruhiko, 5,462,267, Cl. 271-10.040.
Minoru Industrial Company, Limited: *See—*
Ikumoto, Junichi; and Yasuda, Akio, 5,461,993, Cl. 111-52.000.
Minton, Gerald T.; Horwich, Lisa J.; and Gilbert, Steven R., to Procter & Gamble Company, The. Package seal for individually packaged sanitary napkins. 5,462,166, Cl. 206-440.000.
Mio, Masao, to Mitsubishi Denki Kabushiki Kaisha. Liquid-crystal display. 5,463,408, Cl. 345-52.000.
Mirle, Srinivas K.; and Williams, Trevor J., to P T Sub Inc. Photocurable composition, flexible, photosensitive articles made therefrom, and methods of improving solvent resistance and flexibility of those articles. 5,462,835, Cl. 430-287.000.
Misaizu, Kouei: *See—*
Matsuoka, Akihiko; Ohnishi, Hiroshi; Kunieda, Yoshinori; Misaizu, Kouei; and Yamamoto, Yuuri, 5,463,627, Cl. 370-105.100.
Mishima, Masaru: *See—*
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Naka, Michiharu; Koizumi, Hideki; Takahashi, Yuzo; Kinoshita, Hirotugu; and Mishima, Masaru, 5,462,684, Cl. 252-51.50R.
Misiano, Carlo; and Simonetti, Enrlco, to CE.TE.V. Centro Technologie Del Vuoto. Apparatus for continuous reactive metal deposition in vacuum with web looping over upper and lower rollers. 5,462,602, Cl. 118-718.000.
Misiano, Carlo; Simonetti, Enrico; and Staffetti, Francesco, to Consorzio Ce.Te.V. Centro Tecnologie del Vuoto. Thin film multilayer structure as permeation barrier on plastic film. 5,462,779, Cl. 428-34.700.
Misner, Jerry W., to Eli Lilly and Company. One-pot process. 5,463,060, Cl. 546-68.000.
Mississippi Forest Products Laboratory: *See—*
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Misue, Kazuo: *See—*
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Mita Industrial Co., Ltd.: *See—*
Tanaka, Masashi; Fukami, Toshiyuki; Katsukawa, Masato; and Nakamori, Hideo, 5,462,825, Cl. 430-58.000.
Umeda, Yasushi; Tomiyama, Tetsuo; Yoshikawa, Hiroyuki; and Koike, Yuichi, 5,463,545, Cl. 364-187.000.
Mitchell, James B.; Samuni, Amram; DeGraff, William; and Hahn, Stephen, to United States of America, Health and Human Services. Nitroxides as protectors against oxidative stress. 5,462,946, Cl. 514-315.000.
Mitchell, Larry H.: *See—*
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Mitsubishi Denki Kabushiki Kaisha: *See—*
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Hashimoto, Akira; and Miwa, Hiroshi, 5,463,512, Cl. 360-104.000.
Ishii, Tatsuya, 5,463,235, Cl. 257-300.000.
Iwata, Shunichi; and Shimizu, Toru, 5,463,747, Cl. 395-375.000.
Kadota, Yoichi, 5,462,034, Cl. 123-520.000.
Kawaguchi, Takeo, 5,461,773, Cl. 29-605.000.
Kuriyama, Hirotada; and Kohno, Yoshio, 5,463,576, Cl. 365-63.000.
Kurosawa, Miki; Ogawa, Shuji; Sugahara, Masayuki; Funai, Kiyoshi; Yumura, Takashi; and Yamamoto, Tetsu, 5,463,202, Cl. 219-121.830.
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Ohta, Shun, 5,463,544, Cl. 364-147.000.
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Mitsubishi Gas Chemical Company, Inc.: *See—*
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Mitsubishi Gas Chemical Co., Ltd.: *See—*
Kokubu, Jun; Hiro, Yasuo; Hisano, Katsuhiko; and Watanabe, Susumu, 5,462,804, Cl. 428-402.240.
Shirai, Kazushi; Shinbo, Toshihiro; Takeda, Norio; and Arii, Mitsuzo, 5,463,316, Cl. 324-244.100.
Mitsubishi Oil Co., Ltd: *See—*
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Mitsubishi Semiconductor America, Inc.: *See—*
Gibbs, Vickie L.; and Kao, Rom-Shen, 5,463,642, Cl. 371-40.100.
Mitsubishi Shindoh Co., Ltd.: *See—*
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Mitsui PetrochemicalIndustries, Ltd.: *See—*
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Mitsuyasu, Tamotsu; and Sekiguchi, Takuji, to Nippon Hoso Kyokai. Head drum apparatus. 5,463,506, Cl. 360-77.170.
Miwa, Hiroshi: *See—*
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Miyabe, Shigeo: *See—*
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Miyagi National College of Technology: *See—*
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Miyama, Shinichi: *See—*
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Miyamoto, Harukazu; Miyamoto, Makoto; Andoo, Keikichi; Niihara, Toshio; and Ojima, Masahiro, to Hitachi, Ltd.; and Hitachi Maxwell, Ltd. Magneto-optical recording media and mangeto-optical device using the media. 5,462,811, Cl. 428-694.0EC.
Miyamoto, Makoto: *See—*
Miyamoto, Harukazu; Miyamoto, Makoto; Andoo, Keikichi; Niihara, Toshio; and Ojima, Masahiro, 5,462,811, Cl. 428-694.0EC.
Miyamoto, Masaomi: *See—*
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Miyasaka, Kiyoshi: *See—*
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Miyata, Hideaki: *See—*
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Miyata, Hirofumi; Akahoshi, Yoshihiro; Ikeda, Eiichiro; and Furukawa, Yutaka, to Bando Chemical Industries, Ltd. Continuous speed-shifting device. 5,462,492, Cl. 474-38.000.
Miyata, Tsuyoshi: *See—*
Oki, Tetsuro; Harada, Koichiro; Neki, Ryuichi; Kawakami, Kazuo; Miyata, Tsuyoshi; and Matsuo, Kozo, 5,462,900, Cl. 437-249.000.
Miyauchi, Masayoshi: *See—*
Tokuda, Toshimasa; Furukawa, Ikkoh; and Miyauchi, Masayoshi, 5,463,013, Cl. 528-196.000.
Miyazaki, Naoki, to Mitsubishi Denki Kabushiki Kaisha. Apparatus and method for forming wire bonding ball. 5,463,197, Cl. 219-56.220.

Miyazaki, Tsuyoshi; Sanchika, Kouzoh; Nishida, Mitsuhiro; Yasukohchi, Tohru; Kitano, Shigeru; Suginaka, Akinori; and Kadoma, Yoshihito, to NOF Corporation. Phospholipid derivative and reactive vesicle-forming agent. 5,463,066, Cl. 548-112.000.
Miyazawa, Shoichi: *See—*
Kimura, Hiroshi; Miyazawa, Shoichi; Horita, Ryutaro; Hase, Kenichi; Hirano, Akihiko; and Uragami, Akira, 5,463,504, Cl. 360-65.000.
Miyazoe, Seigo; Hisai, Tsuneyoshi; Fushimi, Akira; Takeoka, Kazuhiko; Okude, Yoshitaka; and Kurauchi, Takeo, to Nippon Paint Co., Ltd. Process for forming a coating on a substrate. 5,462,770, Cl. 427-407.100.
Miyoshi, Yoshihiro; Shiraishi, Hiroyuki; Kawai, Kiyoshi; and Koga, Hideaki, to Sumitomo Chemical Company, Limited. Process for producing olefin polymers. 5,463,000, Cl. 526-119.000.
Mizuhashi, Tohru: *See—*
Terao, Kazuhiko; Iida, Hidetoku; Nakayama, Takeyasu; Kubo, Toshiya; Horigome, Jiro; Matsuoka, Yoshihiro; Takeda, Nobutoshi; and Mizuhashi, Tohru, 5,463,709, Cl. 385-85.000.
Mizuishi, Harumitsu: *See—*
Yashiki, Yuichi; Hondumi, Masahiko; Ohki, Yuzuru; Ito, Takashi; Nakjajima, Fumitaka; Mori, Masakazu; Aoki, Takayoshi; Mizuishi, Harumitsu; and Shibuya, Yuusaku, 5,463,456, Cl. 355-299.000.
Mizuishi, Koji: *See—*
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Mizuki, Masayuki: *See—*
Oka, Nobuyuki; Sato, Toshio; and Mizuki, Masayuki, 5,463,602, Cl. 369-44.290.
Mizumachi, Motohiro: *See—*
Ito, Kengo; Mizumachi, Motohiro; Fujiwara, Yoshio; and Shinohara, Satoru, 5,462,910, Cl. 503-227.000.
Mizuno, Hideharu: *See—*
Hosaka, Tohru; Mizuno, Hideharu; Koushima, Yuji; Kohara, Teiji; and Natsuume, Tadao, 5,462,995, Cl. 525-332.100.
Mizuno, Hisamitsu: *See—*
Kurotori, Tsuneo; Echigo, Katsuhiro; Urakawa, Mitsuaki; Mizuno, Hisamitsu; and Hibi, Kunio, 5,463,447, Cl. 355-202.000.
Mizuno, Koichi: *See—*
Adachi, Hideaki; Setsune, Kentaro; and Mizuno, Koichi, 5,462,921, Cl. 505-473.000.
Mizushima Ferroalloy Co., Ltd.: *See—*
Narahara, Hiroshi; and Suzuki, Kouji, 5,462,579, Cl. 75-624.000.
Mizushima, Yoshio: *See—*
Minami, Takanori; Shiraishi, Noriaki; Shimizu, Tsutomu; Takamuku, Kenji; Tsushio, Yoshinori; Mizushima, Yoshio; Yoshimoto, Kazuyuki; and Kadokura, Masaki, 5,462,021, Cl. 123-3.000.
Mizutani, Tatsumi: *See—*
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MKS Instruments, Inc.: *See—*
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Mobil Oil Corporation: *See—*
Audeh, Costandi A.; Shihabi, David S.; Socha, Richard F.; and Stevenson, Scott A., 5,463,168, Cl. 585-854.000.
Jennings, Alfred R., Jr.; and Chambers, Michael R., 5,462,118, Cl. 166-312.000.
Northrop, Paul S., 5,463,165, Cl. 588-250.000.
Mochizuki, Isao: *See—*
Watanabe, Makoto; Mochizuki, Isao; Sato, Yoshitsugu; Takagi, Takeyuki; and Okada, Hiroaki, 5,463,195, Cl. 200-5.00A.
Mochizuki, Manabu: *See—*
Kurotori, Tsuneo; Mochizuki, Manabu; Ariyama, Kenzo; Kojima, Kenji; Tsuruoka, Ichiro; Echigo, Katsuhiro; Miyao, Mayumi; and Ikeda, Itsuo, 5,463,453, Cl. 355-256.000.
Moen Incorporated: *See—*
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Moens, Luc J. R.: *See—*
De Knaep, Alfons G. M.; Moens, Luc J. R.; and Vreysen, Eduard J. C., 5,463,049, Cl. 540-556.000.
Moffat, Karen A.; Pontes, Fatima M.; Paine, Anthony J.; McAneney, Brian; and Puri, Paul, to Xerox Corporation. Styrene/n-butyl acrylate toner resins with excellent gloss and fix properties. 5,462,828, Cl. 430-106.000.
Moghaddam, Minoo J.: *See—*
Matsuda, Takehisa; Moghaddam, Minoo J.; and Sakurai, Katsukiyo, 5,462,976, Cl. 522-74.000.
Mogi, Hirokazu: *See—*
Harigaya, Isao; Mogi, Hirokazu; Kozuki, Susumu; Iijima, Ryunosuke; Toyama, Masamichi; and Hirasawa, Masahide, 5,463,442, Cl. 354-400.000.
Mohlengraft, John S., to GTE California Incorporated. Manhole cover tool. 5,462,385, Cl. 404-25.000.
Mohler, Eric L.: *See—*
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Mohundro, Edgar L.: *See—*
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Moldex Plastics & Tool Inc.: *See—*
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Mollenauer, Linn F.: *See—*
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Möller, Alexander: *See—*
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Moloney, Maurice M.; and Radke, Sharon, to Calgene Inc. Transformation and foreign gene expression in Brassica species. 5,463,174, Cl. 800-205.000.
Moltech Corporation: *See—*
Skotheim, Terje A., 5,462,566, Cl. 29-623.100.
Monbaliu, Marcel: *See—*
Roosen, Raymond; Van Gorp, Herman; and Monbaliu, Marcel, 5,462,822, Cl. 430-7.000.
Monsanto Company: *See—*
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Montabord, Lucien: *See—*
Huvey, Michel; Grosjean, Francois; and Montabord, Lucien, 5,462,774, Cl. 427-555.000.
Monteleone, Michael G.; Weiss, Richard A.; Evans, Mark D.; and Hanna, Marie R., to International Flavors & Fragrances Inc. 1-oxo-substituted and unsubstituted isobutyl-4-ethoxy-benzenes and mixtures thereof with bicyclopentadiene derivatives, uses of same in perfumery and methods for preparing same. 5,462,923, Cl. 512-19.000.
Montgomery, Robert L., to Fireblock International, Inc. Fire retardant materials and methods of use thereof. 5,462,699, Cl. 252-609.000.
Montino, Alessandro: *See—*
Bastioli, Catia; Bellotti, Vittorio; Del Tredici, Gianfranco; Montino, Alessandro; and Ponti, Roberto, 5,462,980, Cl. 524-47.000.
Montividas, Robert E.: *See—*
Hodson, Price R.; Chu, Federico; Buchanan, Arnold; and Montividas, Robert E., 5,461,910, Cl. 73-170.120.
Moog, John F.; and Strauser, Buford R., to Timken Company, The. Shock-absorbing package. 5,462,171, Cl. 206-592.000.
Moor, Adolf H. K.: *See—*
Van Der Hoek, Marinus J.; Moor, Adolf H. K.; Bruinsma, Anastasius J. A.; Roos, Jaap; and Buisman, Jacobus C., 5,462,244, Cl. 246-122.00R.
Moore, Brian B.: *See—*
Elko, David A.; Frey, Jeffrey A.; Helffrich, Audrey A.; Isenberg, John F., Jr.; Moore, Brian B.; Nick, Jeffery M.; Swanson, Michael D.; and Williams, Joseph A., 5,463,736, Cl. 395-848.000.
Moore, Denis L.: *See—*
Filion, Scott M.; Frost, Colin C.; Moore, Denis L.; Roberge, Richard D.; and Yedlin, Vincent J., 5,463,258, Cl. 307-10.100.
Moore, Earl H.; Frick, Thomas J.; and Smith, Wayne W., to Delfield Company, The. Heat transfer device and method. 5,461,878, Cl. 62-255.000.
Moore, John R. Vehicle heater. 5,463,203, Cl. 219-202.000.
Mora, Giovanni: *See—*
Buoli, Carlo; Mora, Giovanni; and Turillo, Tommaso, 5,463,360, Cl. 331-96.000.
Moran, John L., III; Sridhar, Manickam R.; and Brown, William L., to Motorola, Inc. TX preemphasis filter and TX power control based high speed two wire modem. 5,463,661, Cl. 375-222.000.
Morana, Frank J. Hair trimming device. 5,461,780, Cl. 30-30.000.
Morduch, Georg E.; Parkinson, Alvin O.; and Urso, Thomas S., Jr., to Microlog Corporation. Telecommunications system for transferring calls without a private branch exchange. 5,463,684, Cl. 379-202.000.
Moreau, Jacques-Pierre; and Coy, David H., to Tulane Educational Fund, The Administrators of the. Peptides aiding nerve regeneration. 5,462,927, Cl. 514-17.000.
Morehouse, James H.; Furay, David M.; Blagaila, John; Dion, F. Eugene; Shelstad, Scott A.; and Woods, Jimmy L., to Conner Peripherals, Inc. Low profile disk drive apparatus incorporating a three-tiered housing. 5,463,507, Cl. 360-97.020.
Moreira, José R. F.: *See—*
de Souza, Walber P.; and Moreira, José R. F., 5,462,119, Cl. 166-348.000.
Morgan, Paul F.: *See—*
Acquaviva, Thomas; Rees, James D.; Morgan, Paul F.; and Ferrara, Joseph J., 5,463,451, Cl. 355-233.000.
Mori, Hiroyoshi: *See—*
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Mori, Kenji: *See—*
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Mori, Masakazu: *See—*
Yashiki, Yuichi; Hondumi, Masahiko; Ohki, Yuzuru; Ito, Takashi; Nakjajima, Fumitaka; Mori, Masakazu; Aoki, Takayoshi; Mizuishi, Harumitsu; and Shibuya, Yuusaku, 5,463,456, Cl. 355-299.000.
Morimasa, Takanobu: *See—*
Mamiya, Kiyotaka; Imada, Michihiro; and Morimasa, Takanobu, 5,462,039, Cl. 123-686.000.
Morimoto, Takashi: *See—*
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Morin, Claude: *See—*
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- Morioka, Hiroshi; Noguchi, Minori; Ohshima, Yoshimasa; Kembo, Yukio; Nishiyama, Hidetoshi; Matsuoka, Kazuhiko; and Shigyo, Yoshiharu, to Hitachi, Ltd. Method and apparatus for analyzing the state of generation of foreign particles in semiconductor fabrication process. 5,463,459, Cl. 356-237.000.
- Morishita, Masataka: *See—*
  - Kawashima, Makoto; Nagano, Kazuhiro; Hori, Kazuyoshi; Ishikawa, Hiroaki; and Morishita, Masataka, 5,462,929, Cl. 514-43.000.
- Morita, Seiji, to Nikon Corporation. Optical recording medium having large guide groove track pitch/meander amplitude ratio. 5,463,614, Cl. 369-275.400.
- Morita, Shigetaka; Igarashi, Yoshio; and Suzuki, Masanao, to Hitachi Metals, Ltd. Airtight aluminum alloy casting and its manufacturing method. 5,462,612, Cl. 148-439.000.
- Morita, Toshimasa, to Sanshin Kogyo Kabushiki Kaisha. Outboard motor engine. 5,461,940, Cl. 74-603.000.
- Moriyama, Sumihiro: *See—*
  - Sugiyama, Norihide; Nakamura, Masaru; Moriyama, Sumihiro; and Sasaki, Fumihiro, 5,462,586, Cl. 96-13.000.
- Moriyama, Takaaki: *See—*
  - Yoshikawa, Takao; and Moriyama, Takaaki, 5,462,977, Cl. 522-160.000.
- Moroney, Paul: *See—*
  - Walker, Gordon K.; and Moroney, Paul, 5,463,403, Cl. 342-359.000.
- Morrison, Gerald L.: *See—*
  - Hall, Kenneth R.; Morrison, Gerald L.; and Holste, James C., 5,461,932, Cl. 73-861.610.
- Morrissey, Douglas E.; Cavanagh, Edward T., Jr.; and Ng, Kin H., to Unisys Corporation. I/O subsystem with header and error detection code generation and checking. 5,463,762, Cl. 395-185.020.
- Morrow, Howard E.: *See—*
  - Gal, George; and Morrow, Howard E., 5,463,498, Cl. 359-622.000.
- Morrow, John K.: *See—*
  - Polinski, Russell E.; and Morrow, John K., 5,462,167, Cl. 206-455.000.
- Morse, Kenneth: *See—*
  - Kantner, Robert F., Jr.; Iverson, Vaughn S.; Morse, Kenneth; Pietras, Mark A.; and Rodriguez, Arturo A., 5,463,701, Cl. 382-166.000.
- Morse, Theodore H.; Rimai, Donald S.; Potucek, Martin; and Sonnenberg, Sven, to Eastman Kodak Company. Reduction in metallization of a piezoelectric sensor for a xerographic development process to increase sensitivity of the sensor. 5,463,449, Cl. 355-203.000.
- Morton International, Inc.: *See—*
  - Kida, Jeffrey T.; and Kendrick, Alan D., 5,462,448, Cl. 439-357.000.
- Morton, Philip G.: *See—*
  - Chaney, Michael T.; and Morton, Philip G., 5,461,837, Cl. 52-204.680.
- Mos, Johannes: *See—*
  - Hartog, Jan; Van Steen, Bartholomeus J.; Mos, Johannes; and Schipper, Jacques, 5,462,942, Cl. 514-254.000.
- Moskowitz, Ronald: *See—*
  - Raj, Kuldip; and Moskowitz, Ronald, 5,462,685, Cl. 252-62.560.
- Mostaert, Erik: *See—*
  - Hauquier, Guido; Cortens, Willem; Coppens, Paul; Vermeersch, Joan; Mostaert, Erik; and Verschueren, Eric, 5,462,833, Cl. 430-159.000.
- Mostello, Robert A., to BOC Group, Inc., The. Air separation method and apparatus. 5,461,872, Cl. 62-24.000.
- Motiduki, Kunimasa: *See—*
  - Wakimizu, Yukio; Motiduki, Kunimasa; and Nagasawa, Masakazu, 5,463,270, Cl. 313-318.010.
- Motogi, Moriyuki: *See—*
  - Matsuki, Sadao; Motogi, Moriyuki; Nabeshima, Keitaro; and Kadowaki, Minoru, 5,462,790, Cl. 428-229.000.
- Motoki, Akira; and Murayama, Yoichi. Method of manufacturing electromagnetic wave shielding plastic molding. 5,462,771, Cl. 427-537.000.
- Motorola: *See—*
  - Bradley, Wayne H.; and Werner, Richard E., 5,463,694, Cl. 381-92.000.
  - Kato, Yumiko; Jaskie, James E.; and Wiemann, David A., 5,463,273, Cl. 313-461.000.
  - Sorensen, Lars S., 5,463,628, Cl. 370-110.100.
  - Vannatta, Louis J.; and Phillips, James P., 5,463,406, Cl. 343-725.000.
  - Wijas, Thomas S., 5,463,688, Cl. 379-446.000.
- Motorola, Inc.: *See—*
  - Allen, Donald E., 5,463,361, Cl. 333-193.000.
  - Berry, James E.; Pace, Gary L.; Herold, Barry W.; McLaughlin, Kevin; and Graham-Meighan, Margaret, 5,463,306, Cl. 323-222.000.
  - Carson, Robert T.; Hogrefe, Arnold W.; and Juskey, Frank J., Jr., 5,463,190, Cl. 174-259.000.
  - Choon, Los P.; and Redman, Brian, 5,463,531, Cl. 361-737.000.
  - Countryman, Roger S.; and Alvarez, Jose, 5,463,353, Cl. 331-2.000.
  - Dillon, Thomas M.; Krolopp, Robert K.; and Metroka, Michael P., 5,463,646, Cl. 371-69.100.
  - Fernandez, Jose M.; and Meadows, Vernon, 5,462,814, Cl. 429-7.000.
  - Gillig, Steven F.; and Pederson, Glen E., 5,463,674, Cl. 379-59.000.
  - Gruender, Eugene H., Jr.; Clark, C. W.; and Kraft, Douglas R., 5,463,589, Cl. 365-230.010.
  - Holmes, Jeffrey G.; and McNeil, Andrew C., 5,461,774, Cl. 29-840.000.
  - Klayman, Jeffrey T., 5,463,389, Cl. 341-51.000.
  - Marko, Paul D.; Wadin, Craig P.; and Brown, David L., 5,463,351, Cl. 331-1.00A.
  - Moran, John L., III; Sridhar, Manickam R.; and Brown, William L., 5,463,661, Cl. 375-222.000.
  - Nikas, Dimitrios; and Merchant, Zaffer S., 5,463,382, Cl. 340-825.440.
  - Tayloe, Daniel R., 5,463,400, Cl. 342-352.000.
- Motozawa, Yasuki: *See—*
  - Seki, Kazuhiro; Aoki, Takashi; Hirahara, Shinichi; and Motozawa, Yasuki, 5,462,308, Cl. 280-749.000.
- Mouchmouchian, Silva. Baby feeding system. 5,462,101, Cl. 141-364.000.
- Mouliney, Michel: *See—*
  - Bracque, Gilles; Dehaine, Francois; Gourbier, Jean-Pierre; Gourdain, Daniel; Grelaud, Alain; Guillard, Alain; and Mouliney, Michel, 5,461,871, Cl. 62-24.000.
- Mozurkewich, George, to Ford Motor Company. Vibrating beam accelerometer. 5,461,918, Cl. 73-514.260.
- MTS System Corporation: *See—*
  - Harvey, Dennis N.; and Jenniges, Randal L., 5,463,463, Cl. 356-375.000.
- Mücke, Bruno: *See—*
  - Klötzer, Sieghart; and Mücke, Bruno, 5,462,843, Cl. 430-503.000.
- Mudwilder, Greg: *See—*
  - Plavidal, Richard W.; Nitescu, Petru N.; Mudwilder, Greg; and Crockett, Richard, 5,462,080, Cl. 137-337.000.
- Mueller, Heinz-Dieter: *See—*
  - Kurbjuhn, Klaus; and Mueller, Heinz-Dieter, 5,462,443, Cl. 439-78.000.
- Mueller, Richard A.: *See—*
  - Vazquez, Michael L.; Mueller, Richard A.; Talley, John J.; Getman, Daniel; DeCrescenzo, Gary A.; and Freskos, John N., 5,463,104, Cl. 514-533.000.
- Mueller, Richard H.: *See—*
  - Godfrey, Jollie D., Jr.; Mueller, Richard H.; Sedergran, Thomas C.; and Soundararajan, Nachimuthu, 5,463,059, Cl. 546-21.000.
- Mueller, Ted R., to International Business Machines Corporation. Method and system for system debugging through a keyboard device driver. 5,463,764, Cl. 395-182.130.
- Mueller, Thomas: *See—*
  - Himmelsbach, Frank; Linz, Guenter; Austel, Volkhard; Pieper, Helmut; Mueller, Thomas; Weisenberger, Johannes; and Seewaldt-Becker, Elke, 5,463,071, Cl. 548-251.000.
- Mueller, Thomas R.; and Sylvester, Gail M., to Delco Electronics Corporation. Gauge with magnetically fixed rest position. 5,463,314, Cl. 324-146.000.
- Muenzel, Horst: *See—*
  - Marek, Jiri; Schubert, Dietrich; Baumann, Helmut; Muenzel, Horst; Offenberg, Michael; and Willmann, Martin, 5,461,917, Cl. 73-514.160.
- Muhich, John S.: *See—*
  - Albaugh, Virgil A.; Muhich, John S.; Silha, Edward J.; and Vanover, Michael T., 5,463,739, Cl. 395-826.000.
- Muhle, Michael E.: *See—*
  - Griffin, John R.; DeChellis, Marc L.; and Muhle, Michael E., 5,462,999, Cl. 526-68.000.
- Muhlemann, Kurt, to U.S. Philips Corporation. Integrated semiconductor circuit protected against high voltage breakdown. 5,463,239, Cl. 257-355.000.
- Mukai, Hidehito; Sato, Kenichi; and Shibuta, Nobuhiro, to Sumitomo Electric Industries, Inc. Method of preparing oxide superconducting wire. 5,462,920, Cl. 505-432.000.
- Mukai, Hiromu: *See—*
  - Shintani, Dai; Okada, Hiroyuki; Hoda, Takeo; Izumi, Shuji; Mukai, Hiromu; Hatamori, Osamu; and Tsuji, Sadafusa, 5,463,436, Cl. 354-81.000.
- Mukherjee, Shyama P.: *See—*
  - Baum, Thomas H.; Mukherjee, Shyama P.; O'Toole, Terrence R.; Tai, Alice F.; and Viehbeck, Alfred, 5,462,897, Cl. 437-230.000.
- Mukherjee, Subhashish: *See—*
  - Jones, Steven C.; Mukherjee, Subhashish; and Kwan, Stephen C., 5,463,347, Cl. 330-253.000.
- Mulkey, Steven L.: *See—*
  - Clupper, Charles B.; Emigh, Jonathan D.; Mulkey, Steven L.; Fehringer, Robert L.; Flickner, Brett J.; Saldana, Daniel M.; and Delfer, Frank W., III, 5,462,399, Cl. 414-790.300.
- Muller, Fabien, to Delphi France Automotive Systems. Electrical connector for battery terminals. 5,462,453, Cl. 439-510.000.
- Muller, George W., to Celgene Corporation. Ring closure of N-phthaloylglutamines. 5,463,063, Cl. 546-201.000.
- Müller, Josef, to Hoechst Aktiengesellschaft. Bulk material container having a bottom outlet valve. 5,462,254, Cl. 251-144.000.
- Müller, Klaus-Helmut, to Bayer Aktiengesellschaft. Process for preparing difluoromethoxyarenes and difluoromethylthioarenes. 5,463,138, Cl. 568-655.000.
- Müller, Michael: *See—*
  - Eckel, Hans-Gerd; Kunkel, Anja; and Müller, Michael, 5,462,261, Cl. 267-140.130.
- Müller, Peter: *See—*
  - Malouvier, Dominique; Müller, Peter; and Sebastiani, Oscar, 5,462,061, Cl. 128-720.000.
- Müller, Thomas: *See—*
  - Bahrmann, Helmut; Greb, Wolfgana; Heymanns, Peter; Lappe, Peter; Müller, Thomas; Szameitat, Jürgen; and Wiebus, Ernst, 5,462,986, Cl. 524-296.000.
  - Bahrmann, Helmut; Greb, Wolfgang; Heymanns, Peter; Lappe, Peter; Müller, Thomas; Szameitat, Jürgen; and Wiebus, Ernst, 5,463,147, Cl. 568-882.000.
- Müller, Walter: *See—*

- Wolter, Karin; Müller, Walter; Simon, Günter; Nalbach, Christa; and Hoffmann, Hans-Rainer, 5,462,746, Cl. 424-449.000.
- Muller, Werner: *See—*
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- Müller, Wolfgang, to Bruker Analytische Messtechnik GmbH. Magnet system for NMR tomography. 5,463,364, Cl. 335-299.000.
- Müller-Broll, Gerhard: *See—*
  - Stief, Reinhard; Müller-Broll, Gerhard; Jost, Thomas; Mattutat, Manfred; and Schmitt, Klaus-Dieter, 5,462,331, Cl. 296-198.000.
- Mullins, Randal L.: *See—*
  - McCann, James D.; and Mullins, Randal L., 5,463,415, Cl. 347-74.000.
- Mundt, Randall S., to Lam Research Corporation. Hybrid electrostatic chuck. 5,463,526, Cl. 361-234.000.
- Munkel, Kenneth J., to Woodsmith Corporation. Cabinet scraper blade filing and burnishing tool. 5,461,943, Cl. 76-89.200.
- Murakami, Kakuji; and Nagai, Kiyofumi, to Ricoh Company, Ltd. Aqueous ink composition. 5,462,592, Cl. 106-22.00R.
- Murakami, Saburo. Automatic tightener. 5,462,098, Cl. 140-119.000.
- Murakami, Seishi, to Tokyo Electron Limited. Semiconductor processing apparatus. 5,462,603, Cl. 118-719.000.
- Murakami, Tomoyuki, to Innoshimaseiki Co., Ltd. Apparatus for producing precured retreaded tire. 5,462,630, Cl. 156-421.200.
- Murakami, Yoichi: *See—*
  - Kubota, Kazuomi; and Murakami, Yoichi, 5,463,086, Cl. 549-274.000.
- Murakami, Yukiyasu: *See—*
  - Tamazawa, Kazuharu; Kojima, Tadao; Arima, Hideki; Murakami, Yukiyasu; Isomura, Yasuo; Okada, Minoru; Takanobu, Kiyoshi; and Takenaka, Toichi, 5,463,064, Cl. 546-281.000.
- Muraki, Masato; Suzuki, Akiyoshi; and Imai, Shunzo, to Canon Kabushiki Kaisha. Illumination device including an optical integrator defining a plurality of secondary light sources and related method. 5,463,497, Cl. 359-618.000.
- Muramatsu, Masami: *See—*
  - Sumi, Yoshihiko; Ichikawa, Yataro; Aoki, Nobuo; and Muramatsu, Masami, 5,463,025, Cl. 530-380.000.
- Murata Mfg. Co., Ltd.: *See—*
  - Iwatani, Hidetoshi; Fujino, Masato; Matsumoto, Shinji; Fujii, Choichiro; and Kazama, Masakazu, 5,463,365, Cl. 336-98.000.
  - Nakaya, Kazuyoshi, 5,463,664, Cl. 375-360.000.
- Murata, Takahiko: *See—*
  - Kanayama, Shinji; Kabeshita, Akira; Nishino, Kenichi; Ohnakada, Satoshi; Murata, Takahiko; Kimura, Kazuhiro; and Nishida, Kazuto, 5,462,626, Cl. 156-272.800.
- Murayama, Yoichi: *See—*
  - Motoki, Akira; and Murayama, Yoichi, 5,462,771, Cl. 427-537.000.
- Murg, Erwin, to Swarovski Optik KG. Aiming telescope. 5,463,495, Cl. 359-429.000.
- Muroi, Junichi: *See—*
  - Kai, Osamu; Muroi, Junichi; Suzuki, Nobuo; Takagi, Tatsumi; Sakata, Shigekazu; and Oikawa, Hideyuki, 5,463,679, Cl. 379-145.000.
- Muroi, Takashiro; Sato, Toshio; Ito, Ikuo; and Takeda, Kyoichi, to Sumikin Chemical Co., Ltd. Method and apparatus for dehydrogenation. 5,463,156, Cl. 585-400.000.
- Murphy, Thomas B., to Doskocil Manufacturing Co. Inc. Kennel hull latch. 5,462,015, Cl. 119-19.000.
- Murphy, Timothy A., to Boeing Company, The. Shield integrity monitor. 5,463,317, Cl. 324-520.000.
- Murray, Brendan D.: *See—*
  - Singleton, David M.; and Murray, Brendan D., 5,463,143, Cl. 568-864.000.
- Murray, D. Gary: *See—*
  - Turner, Josephine S.; Murray, D. Gary; Zuccolin, John D.; and Li, Ruey S., 5,462,743, Cl. 424-448.000.
- Murray, James P.: *See—*
  - Murray, John J.; and Murray, James P., 5,461,833, Cl. 52-155.000.
- Murray, John J.; and Murray, James P. Easy-up sand anchor. 5,461,833, Cl. 52-155.000.
- Murray, William M. Bone and dental cement method and preform. 5,462,356, Cl. 366-348.000.
- Muth, Ross R.: *See—*
  - Kaplan, Donald S.; Hermes, Matthew E.; Muth, Ross R.; Brown, David L.; and Holzwarth, Henry A., 5,462,162, Cl. 206-339.000.
- Muto, Miyuki: *See—*
  - Ohnishi, Takao; Osugi, Yukihisa; and Muto, Miyuki, 5,463,462, Cl. 356-354.000.
- MVM Electronics: *See—*
  - Shah, Manhar L., 5,463,493, Cl. 359-312.000.
- Myerholtz, Carl A.: *See—*
  - Robotti, Karla M.; and Myerholtz, Carl A., 5,462,991, Cl. 525-54.300.
- N.V. Bekaert S.A.: *See—*
  - Bruyneel, Pol; and Bourgois, Luc, 5,461,850, Cl. 57-212.000.
- N.V. Nederlandse Spoorwegen: *See—*
  - Van Der Hoek, Marinus J.; Moor, Adolf H. K.; Bruinsma, Anastasius J. A.; Roos, Jaap; and Buisman, Jacobus C., 5,462,244, Cl. 246-122.00R.
- Nabeshima, Keitaro: *See—*
  - Matsuki, Sadao; Motogi, Moriyuki; Nabeshima, Keitaro; and Kadowaki, Minoru, 5,462,790, Cl. 428-229.000.
- Naddell, Marc C.: *See—*
  - Grube, Gary W.; Bunkenburg, Brian K.; and Naddell, Marc C., 5,463,617, Cl. 370-29.000.
- Nagahori, Takeshi; Oami, Toshimasa; and Anzai, Noriko, to NEC Corporation. Circuit for converting unipolar input to bipolar output. 5,463,345, Cl. 327-374.000.
- Nagai, Kiyofumi: *See—*
  - Murakami, Kakuji; and Nagai, Kiyofumi, 5,462,592, Cl. 106-22.00R.
- Nagakura, Akira: *See—*
  - Yuasa, Yoshifumi; Okeda, Yoshiki; Tachikawa, Akio; Nagakura, Akira; and Tsuruta, Haruki, 5,463,118, Cl. 562-502.000.
- Nagamatsu, Hiromitsu, to Hitachi Metals, Ltd. Chain and Connecting pin thereof. 5,461,852, Cl. 59-84.000.
- Nagami, Tetsuo; Ogura, Yoshitsugu; Ogai, Masahiko; Fukushima, Yoshiaki; Inagaki, Shinji; Fukumoto, Kazuhiro; Banno, Kouji; Sakakibara, Yuji; Takada, Yasuo; Ohta, Takashi; Okada, Akane; Yamada, Yukimura; Hayashi, Kiyotaka; Matsuura, Shinji; and Kuroda, Kaz. Exhaust gas purifying catalyst. 5,462,905, Cl. 502-232.000.
- Nagano, Kazuhiro: *See—*
  - Kawashima, Makoto; Nagano, Kazuhiro; Hori, Kazuyoshi; Ishikawa, Hiroaki; and Morishita, Masataka, 5,462,929, Cl. 514-43.000.
- Nagano, Saburou; Tateno, Shuichi; Kamitubo, Kouichi; Tajima, Kenichi; and Nakanishi, Masahito, to Kyocera Corporation. Composite ceramic sintered material. 5,462,813, Cl. 428-698.000.
- Nagao, Akira: *See—*
  - Yamamoto, Taizo; Konishi, Hirokazu; Kawaguchi, Yoshihisa; and Nagao, Akira, 5,463,465, Cl. 356-394.000.
- Nagaoka, Yukiko: *See—*
  - Sakurai, Tomohisa; Nagaoka, Yukiko; Kubota, Tetsumaru; and Ikeda, Yuichi, 5,462,522, Cl. 604-22.000.
- Nagasawa, Masakazu: *See—*
  - Wakimizu, Yukio; Motiduki, Kunimasa; and Nagasawa, Masakazu, 5,463,270, Cl. 313-318.010.
- Nagashima, Noriaki, to NEC Corporation. System for detecting non-coincidence of codes. 5,463,645, Cl. 371-67.100.
- Nagatomi, Toshio: *See—*
  - Masumoto, Katuhisa; Nagatomi, Toshio; Nakamura, Akihiko; and Yamada, Yoshimi, 5,463,069, Cl. 548-190.000.
- Nagayama, Atsuo: *See—*
  - Hara, Ryuichi; Nagayama, Atsuo; and Kumiya, Hidetoshi, 5,463,297, Cl. 318-568.130.
- Nagayasu, Takayoshi: *See—*
  - Negoto, Hidenori; Katayama, Mikio; Nakazawa, Kiyoshi; Kato, Hiroaki; Kanemori, Yuzuru; and Nagayasu, Takayoshi, 5,463,230, Cl. 257-66.000.
- Nagy, Tibor, to Robert Bosch GmbH. Method of producing elastic wiping blade for windshield wiper of motor vehicle. 5,462,707, Cl. 264-146.000.
- Naito, Ryuichi, to Pioneer Electronic Corporation. Optical disc with data recorded at different rates on different zones and recording apparatus, and reproducing apparatus therefor. 5,463,604, Cl. 369-50.000.
- Naitoh, Shigeki: *See—*
  - Saito, Noriaki; Morimoto, Takashi; Takebe, Kazuo; Shiomi, Yutaka; Naitoh, Shigeki; and Kanagawa, Shuichi, 5,462,997, Cl. 525-507.000.
- Naka, Michiharu; Koizumi, Hideki; Takahashi, Yuzo; Kinoshita, Hirotugu; and Mishima, Masaru, to Nippon Oil Co., Ltd.; and NSK Ltd. Grease composition containing alkyl diphenyl ether oil and diurea thickener. 5,462,684, Cl. 252-51.50R.
- Nakae, Tetsiochi; and Matsubara, Kunihiro, to Casio Computer Co., Ltd. Effect imparting apparatus having storage units for storing programs corresponding to form and effect to be imparted to an input signal and for storing output form programs to determine form of output signal with imparted effect. 5,463,691, Cl. 381-61.000.
- Nakagaki, Shintaro: *See—*
  - Takanashi, Itsuo; Nakagaki, Shintaro; Negishi, Ichiro; Suzuki, Tetsuji; Tatsumi, Fujiko; Takahashi, Ryusaku; and Maeno, Keiichi, 5,463,468, Cl. 358-296.000.
- Nakagawa, Akio: *See—*
  - Ogura, Tsuneo; Watanabe, Kiminori; Nakagawa, Akio; Yamaguchi, Yoshihiro; Yasuhara, Norio; Matsudai, Tomoko; Hasegawa, Shigeru; and Nakayama, Kazuya, 5,463,231, Cl. 257-138.000.
- Nakagawa, Shinichi: *See—*
  - Takabatake, Akihiko; Uramoto, Shinichi; and Nakagawa, Shinichi, 5,463,340, Cl. 327-211.000.
- Nakagomi, Hirofumi: *See—*
  - Wakisaka, Toshiaki; and Nakagomi, Hirofumi, 5,462,138, Cl. 188-77.00R.
- Nakahata, Kozo: *See—*
  - Ichinose, Toshiaki; Ninomiya, Takanori; Kuni, Asahiro; Nakahata, Kozo; Hamada, Toshimitsu; and Ayabe, Toshihiko, 5,463,667, Cl. 378-58.000.
- Nakajima, Tadayoshi: *See—*
  - Katoh, Hisashi; Nakajima, Tadayoshi; Hata, Tsunehisa; Miyano, Hideyo; and Koda, Shinsuke, 5,462,108, Cl. 164-98.000.
- Nakajima, Yuki: *See—*
  - Fukazawa, Nobuyuki; Suzuki, Tsuneji; Kawauchi, Nobuya; Komatsu, Hironori; Otsuka, Kengo; and Nakajima, Yuki, 5,463,061, Cl. 546-158.000.
- Nakamori, Hideo: *See—*
  - Tanaka, Masashi; Fukami, Toshiyuki; Katsukawa, Masato; and Nakamori, Hideo, 5,462,825, Cl. 430-58.000.
- Nakamura, Akihiko: *See—*

Masumoto, Katuhisa; Nagatomi, Toshio; Nakamura, Akihiko; and Yamada, Yoshimi, 5,463,069, Cl. 548-190.000.
Nakamura, Akira: *See—*
Yoshida, Hiroaki; Ohta, Masashi; and Nakamura, Akira, 5,462,343, Cl. 303-114.100.
Nakamura, Hiroaki: *See—*
Terashita, Takaaki; and Nakamura, Hiroaki, 5,463,470, Cl. 358-298.000.
Nakamura, Hisashi, to Zexel Corporation. Fuel injection timing control device and method for internal combustion engine. 5,462,032, Cl. 123-501.000.
Nakamura, Kazuyuki, to NEC Corproation. Static semiconductor memory device having improved read operation margin and speed. 5,463,580, Cl. 365-189.010.
Nakamura, Masaru: *See—*
Sugiyama, Norihide; Nakamura, Masaru; Moriyama, Sumihiro; and Sasaki, Fumihiro, 5,462,586, Cl. 96-13.000.
Nakamura, Shinichi: *See—*
Kosaka, Yoko; Takiguchi, Takao; Iwaki, Takashi; Togano, Takeshi; Nakamura, Shinichi; and Nakazawa, Ikuo, 5,462,694, Cl. 252-299.610.
Nakamura, Takao; Inada, Hiroshi; and Iiyama, Michitomo, to Sumitomo Electric Industries, Ltd. Superconducting field effect device with vertical channel formed of oxide superconductor material. 5,462,918, Cl. 505-193.000.
Nakamura, Takeshi: *See—*
Kan, Yoshio; Nakamura, Takeshi; and Akabane, Yukihiro, 5,462,489, Cl. 464-179.000.
Nakamura, Yusuke; and Sato, Takaaki, to Cancer Institute; and Eisai Co., Ltd. Anti-human prohibitin antibodies. 5,463,026, Cl. 530-387.900.
Nakane, Katsumi: *See—*
Nakano, Tsutomu; and Nakane, Katsumi, 5,463,557, Cl. 364-470.000.
Nakanishi, Masahito: *See—*
Nagano, Saburou; Tateno, Shuichi; Kamitubo, Kouichi; Tajima, Kenichi; and Nakanishi, Masahito, 5,462,813, Cl. 428-698.000.
Nakanishi, Tohru: *See—*
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Nakano, Masaaki; Inoue, Tomoaki; Amano, Hideaki; Takatsuka, Akio; Beppu, Osamu; Mori, Kenji; Yoshida, Takashi; and Kohno, Takashi, to Hitachi, Ltd. Spindle unit having pre-load mechanism. 5,463,511, Cl. 360-99.080.
Nakano, Masachika: *See—*
Kashima, Toshihiro; Hoshino, Masayuki; Nakano, Masachika; and Hirano, Tokushiro, 5,462,791, Cl. 428-259.000.
Nakano, Takeshi: *See—*
Tomioka, Isao; Nakano, Takeshi; Furukawa, Mikio; and Echigo, Yoshiaki, 5,463,016, Cl. 528-353.000.
Nakano, Toshihiko: *See—*
Maeda, Akira; Sugimura, Yoshikane; Funabashi, Motohisa; Nakano, Toshihiko; Someya, Ryuko; and Kosaka, Michitaka, 5,463,718, Cl. 395-23.000.
Nakano, Tsutomu; and Nakane, Katsumi, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Roving machine. 5,463,557, Cl. 364-470.000.
Nakao, Fujimasa: *See—*
Yamamoto, Ryoichi; Nakao, Fujimasa; Okamoto, Etsurou; and Yagi, Yasuhiko, 5,463,113, Cl. 562-414.000.
Nakata, Kazushi: *See—*
Yamamoto, Shigeru; Matsushita, Shigenori; Zhang, Shu H.; Nishita, Satoru; and Nakata, Kazushi, 5,462,122, Cl. 172-2.000.
Nakata, Naotaro; Aoki, Naofumi; and Okada, Kenji, to Rohm Co., Ltd.; and Nippon Telegraph & Telephone Corporation. Optical fiber receptacle and method of producing the same. 5,463,707, Cl. 385-35.000.
Nakata, Tetsuro, to Sony Corporation. Digital data rounding. 5,463,570, Cl. 364-745.000.
Nakaya, Kazuyoshi, to Murata Mfg. Co., Ltd. DQPSK delay detection circuit that produces stable clock signal in response to both I and Q signals. 5,463,664, Cl. 375-360.000.
Nakayama, Hiroshi, to NEC Corporation. Semiconductor memory device with built-in confirmation unit for accelerating test. 5,463,636, Cl. 395-183.010.
Nakayama, Kazuya: *See—*
Ogura, Tsuneo; Watanabe, Kiminori; Nakagawa, Akio; Yamaguchi, Yoshihiro; Yasuhara, Norio; Matsudai, Tomoko; Hasegawa, Shigeru; and Nakayama, Kazuya, 5,463,231, Cl. 257-138.000.
Nakayama, Takeyasu: *See—*
Terao, Kazuhiko; Iida, Hidetoku; Nakayama, Takeyasu; Kubo, Toshiya; Horigome, Jiro; Matsuoka, Yoshihiro; Takeda, Nobutoshi; and Mizuhashi, Tohru, 5,463,709, Cl. 385-85.000.
Nakazawa, Ikuo: *See—*
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Nakazawa, Kiyoshi: *See—*
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Nakazawa, Tamotsu, to Canon Kabushiki Kaisha. Image processing apparatus with compression error detector. 5,463,700, Cl. 382-232.000.
Nakjajima, Fumitaka: *See—*
Yashiki, Yuichi; Hondumi, Masahiko; Ohki, Yuzuru; Ito, Takashi; Nakjajima, Fumitaka; Mori, Masakazu; Aoki, Takayoshi; Mizuishi, Harumitsu; and Shibuya, Yuusaku, 5,463,456, Cl. 355-299.000.
Nalbach, Christa: *See—*
Wolter, Karin; Müller, Walter; Simon, Günter; Nalbach, Christa; and Hoffmann, Hans-Rainer, 5,462,746, Cl. 424-449.000.
Nalco Chemical Company: *See—*
Smith, Scott J.; and Lind, Eric J., 5,462,972, Cl. 521-53.000.
Nam, Ki H.: *See—*
Cho, Jung H.; Oh, Chang H.; and Nam, Ki H., 5,463,046, Cl. 540-350.000.
Nami, Yasuo: *See—*
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Narabayashi, Tadashi: *See—*
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Narahara, Hiroshi; and Suzuki, Kouji, to Mizushima Ferroalloy Co., Ltd. Method and apparatus for manufacturing medium or low carbon ferromanganese. 5,462,579, Cl. 75-624.000.
Narayan, Ramani: *See—*
Bloembergen, Steven; and Narayan, Ramani, 5,462,983, Cl. 524-51.000.
Narushima, Shinichi: *See—*
Kawasaki, Hiroaki; Sakurada, Hiroshi; Narushima, Shinichi; Iwasa, Tadashi; and Yamaguchi, Hiroshi, 5,463,276, Cl. 313-496.000.
Nassar, Rami V., to AMSTED Industries Incorporated. Side arm structure of a steering arm assembly having an undercut radius. 5,461,987, Cl. 105-167.000.
Nasu, Motohito. Solid-liquid separator for sludge. 5,462,661, Cl. 210-206.000.
Nasu, Yasuhiro; Ichimura, Teruhiko; and Matsumoto, Tomotaka, to Fujitsu Limited. Method of manufacturing thin film transistors in a liquid crystal display apparatus. 5,462,885, Cl. 437-40.000.
National Electrostatics Corp.: *See—*
Schroeder, James B., 5,463,268, Cl. 313-293.000.
National Optronics, Inc.: *See—*
Kennedy, Brian H., 5,462,475, Cl. 451-384.000.
National Research Council of Canada: *See—*
McGregor, Gavin, 5,461,769, Cl. 29-527.400.
National Semiconductor Corporation: *See—*
Kuo, James R., 5,463,331, Cl. 326-86.000.
Llewellyn, William D., 5,463,655, Cl. 375-359.000.
Yee, Loren W.; and Sinh, Nguyen X., 5,463,332, Cl. 326-126.000.
National Service Industries, Inc.: *See—*
Johnson, James C., 5,463,280, Cl. 315-187.000.
Natsuume, Tadao: *See—*
Hosaka, Tohru; Mizuno, Hideharu; Koushima, Yuji; Kohara, Teiji; and Natsuume, Tadao, 5,462,995, Cl. 525-332.100.
Naue/Johnson Controls Engineering Verwaltungs GmbH: *See—*
Schmale, Gerhard; Sommer, Norbert; and Zynda, Martin, 5,462,339, Cl. 297-452.550.
Navitrak Corp.: *See—*
Hill, David C., 5,461,792, Cl. 33-1.0SD.
Nawaki, Masaru: *See—*
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Nazeeruddin, Mohammad K.: *See—*
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Nazif, Zaher A.: *See—*
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Neal, Daniel R.: *See—*
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Nealon, William J.; and Rajan, Heidi A., to AT&T IPM Corp. Apparatus and method of configuring a cordless telephone for operating in a frequency hopping system. 5,463,659, Cl. 375-202.000.
Nebashi, Noriyuki: *See—*
Wakabayashi, Kimihiro; and Nebashi, Noriyuki, 5,462,648, Cl. 205-75.000.
NEC Corporation: *See—*
Aimoto, Yoshiharu; and Sugibayashi, Tadahiko, 5,463,591, Cl. 365-230.050.
Chonan, Toru, 5,463,588, Cl. 365-226.000.
Fukuoka, Akira; Kawai, Jun; and Tagami, Satoru, 5,463,266, Cl. 310-359.000.
Goto, Hiroyuki, 5,463,550, Cl. 364-489.000.
Hamauchi, Tetsuji, 5,463,760, Cl. 395-500.000.
Hoshino, Yasuharu, 5,463,584, Cl. 365-189.050.
Hoshino, Yoshimasa, 5,463,513, Cl. 360-104.000.
Ikeda, Yasuo, 5,462,899, Cl. 437-238.000.
Ishikawa, Toru, 5,463,592, Cl. 365-230.060.
Isono, Toshio, 5,463,255, Cl. 257-773.000.
Iwasaki, Motoya, 5,463,401, Cl. 342-359.000.
Joichi, Masahiko; and Furukawa, Yoshihisa, 5,463,767, Cl. 395-183.130.
Kage, Kouzou, 5,463,672, Cl. 379-59.000.
Kakizaki, Akemi, 5,463,477, Cl. 358-431.000.
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Matai, Masahiro, 5,463,380, Cl. 340-825.440.
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Saitoh, Takenori, 5,463,737, Cl. 395-496.000.
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Sawai, Yasunori, 5,463,395, Cl. 341-156.000.
Shinjo, Teruya; Yamamoto, Hidefumi; Anno, Toshihiko; and Takada, Toshio, 5,462,795, Cl. 428-332.000.
Suzuki, Hiroshi, 5,463,621, Cl. 370-60.000.
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Takizawa, Hiroshi, 5,463,687, Cl. 379-433.000.
Tsukada, Michiko; and Matsuoka, Akio, 5,462,889, Cl. 437-60.000.
Tsunoda, Kazuyuki; and Fujisawa, Ichiro, 5,463,368, Cl. 340-309.150.
Umezawa, Kazuhiko, 5,463,528, Cl. 361-699.000.
Watanabe, Toshio, 5,463,240, Cl. 257-369.000.
Yamaguchi, Masahiro, 5,462,837, Cl. 430-311.000.
Yamaji, Hirotaka, 5,463,350, Cl. 330-296.000.

NEC Corproation: *See—*
Nakamura, Kazuyuki, 5,463,580, Cl. 365-189.010.

NEC Electronics, Inc.: *See—*
Sun, Young-Jen, 5,463,394, Cl. 341-136.000.
Toy, Steve, 5,463,311, Cl. 324-96.000.

Nedderman, William H., Jr.; and Meunier, Robert, to United States of America, Navy. Non-turbulent pull down eye for buoyant test vehicle. 5,462,000, Cl. 114-249.000.

Negishi, Ichiro: *See—*
Takanashi, Itsuo; Nakagaki, Shintaro; Negishi, Ichiro; Suzuki, Tetsuji; Tatsumi, Fujiko; Takahashi, Ryusaku; and Maeno, Keiichi, 5,463,468, Cl. 358-296.000.

Negoto, Hidenori; Katayama, Mikio; Nakazawa, Kiyoshi; Kato, Hiroaki; Kanemori, Yuzuru; and Nagayasu, Takayoshi, to Sharp Kabushiki Kaisha. Active matrix board. 5,463,230, Cl. 257-66.000.

Neier, Benjamin R., to Roto-Mix Enterprises, Ltd. Livestock feed mixer. 5,462,354, Cl. 366-314.000.

Neki, Ryuichi: *See—*
Oki, Tetsuro; Harada, Koichiro; Neki, Ryuichi; Kawakami, Kazuo; Miyata, Tsuyoshi; and Matsuo, Kozo, 5,462,900, Cl. 437-249.000.

Nelams, Frank: *See—*
Herman, Ella H.; Nelams, Frank; and Hilbish, Joseph M., 5,462,539, Cl. 604-385.100.

Nelms, William M.: *See—*
Ellingson, David I.; Michael, Daryl A.; and Nelms, William M., 5,462,348, Cl. 312-301.000.

Nelson, Dale H., to AT&T IPM Corp. Electrostatic discharge protection with hysteresis trigger circuit. 5,463,520, Cl. 361-56.000.

Nelson Industries, Inc.: *See—*
Verdegan, Barry M.; Holm, Christopher E.; Fallon, Stephen L.; and Schwandt, Brian W., 5,462,679, Cl. 210-798.000.

Nelson, Philip L.: *See—*
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Nemoto, Shusuke: *See—*
Azuma, Toshiro; Seno, Yasuo; Kitagawara, Hiroshi; and Nemoto, Shusuke, 5,462,148, Cl. 192-48.300.

Neri, Carlo; Costanzi, Silvestro; and Angaroni, Mariangela, to Enichem Synthesis S.p.A. Solid blends of stabilizers for polymers. 5,462,984, Cl. 524-102.000.

Nesler, Clay G.: *See—*
Pascucci, Gregory A.; Rasmussen, David E.; Decious, Gaylon M.; Garbe, James R.; Hyzer, Susan M.; Woest, Karen L.; Vairavan, Vairavan; Koch, David L.; Gottschalk, Donald A., Jr.; Burkhardt, Dennis E.; Standish, Darrell E.; Madaus, Paul W.; Spacek, Dan J.;, 5,463,735, Cl. 395-200.100.

Nestec S.A.: *See—*
Wadell, Lars G. A., 5,462,152, Cl. 198-409.000.

Neuffer, Kurt: *See—*
Bullmer, Wolfgang; and Neuffer, Kurt, 5,462,499, Cl. 477-120.000.

Neuhoff, David L.; and Pappas, Thrasyvoulos N., to AT&T Corp. Model-based halftoning. 5,463,472, Cl. 358-298.000.

Neurogen Corporation: *See—*
Thurkauf, Andrew; and Hutchison, Alan, 5,463,054, Cl. 544-250.000.

Neuspiel, Peter J. Filter underdrain module and underdrain system. 5,462,664, Cl. 210-274.000.

New England Medical Center Hospitals, Inc.: *See—*
Bachovchin, William W.; Plaut, Andrew G.; and Flentke George R., 5,462,928, Cl. 514-19.000.
Wang, Paul J.; and Groeneveld, Peter W., 5,462,545, Cl. 606-41.000.

New York Mercantile Exchange: *See—*
Markowitz, Arthur D.; and Sabo, John J., 5,463,547, Cl. 364-408.000.

New York University: *See—*
Clarkson, Allen B., Jr.; and Grady, Robert W., 5,462,969, Cl. 514-575.000.

Newman, David S.: *See—*
Yifrach, Aharon; and Newman, David S., 5,463,599, Cl. 369-7.000.

Newman, John A.: *See—*
Funderburk, C. Michael; Jordan, P. Kurt; Newman, John A.; McEwen, J. C.; and Howell, David C., 5,461,998, Cl. 112-306.000.

Newman, Lawrence F., to Foster Wheeler Energy Corporation. Mounting and linkage system for burners in a furnace. 5,461,990, Cl. 110-261.000.

Newton, John K.: *See—*
DeWachter, Gary; and Newton, John K., 5,462,381, Cl. 403-365.000.

Next Computer, Inc.: *See—*
Crandall, Richard E., 5,463,690, Cl. 380-30.000.

Ng, Kin H.: *See—*
Morrissey, Douglas E.; Cavanagh, Edward T., Jr.; and Ng, Kin H., 5,463,762, Cl. 395-185.020.

NGK Insulators, Ltd.: *See—*
Abe, Fumio; Kondo, Tomoharu; and Deguchi, Yuuji, 5,463,206, Cl. 219-553.000.
Ohnishi, Takao; Osugi, Yukihisa; and Muto, Miyuki, 5,463,462, Cl. 356-354.000.

Ngoc, Hung D.; and Salazar, Mariano, to Goodyear Tire & Rubber Company, The. Rubbery polymer. 5,462,993, Cl. 525-274.000.

Nguyen, Luong T.: *See—*
Shaber, Steven H.; and Nguyen, Luong T., 5,462,931, Cl. 514-63.000.

Nguyen, Nghi V.; Cannell, David W.; and Mathews, Roger A., to Redken Laboratories, Inc. Assessment of damage in keratin fibers. 5,461,925, Cl. 73-789.000.

Nguyen, Ngon B.; and Jones, Franklin B., to Westinghouse Electric Corp. Semiconductor component package. 5,463,250, Cl. 257-698.000.

Nguyen, Ngon B.: *See—*
Jones, Franklin B.; Nguyen, Ngon B.; and Laurandeau, Leroy, 5,463,252, Cl. 257-723.000.

Nguyen, Son V.; Dobuzinsky, David M.; Dopp, Douglas J.; and Harmon, David L. Fluorinated silicon nitride films. 5,462,812, Cl. 428-696.000.

Niagara Therapy Manufacturing, Inc.: *See—*
Anderson, Louis R., 5,462,516, Cl. 601-99.000.

Nicholas, Darrel D.; and Schultz, Tor P., to Mississippi Forest Products Laboratory. Synergistic wood preservative compositions. 5,462,589, Cl. 106-18.330.

Nichols, Raymond L., II: *See—*
Nichols, Raymond L., Sr.; and Nichols, Raymond L., II, 5,462,507, Cl. 482-104.000.

Nichols, Raymond L., Sr.; and Nichols, Raymond L., II, to Southern Xercise, Inc. Apparatus for docking an exercise machine. 5,462,507, Cl. 482-104.000.

Nick, Jeffery M.: *See—*
Elko, David A.; Frey, Jeffrey A.; Helffrich, Audrey A.; Isenberg, John F., Jr.; Moore, Brian B.; Nick, Jeffery M.; Swanson, Michael D.; and Williams, Joseph A., 5,463,736, Cl. 395-848.000.

Nicol, Stuart W., to Lucas Industries public limited company. Fuel pumping apparatus. 5,462,029, Cl. 123-450.000.

Nidek Co., Ltd.: *See—*
Isogai, Naoki; Mimura, Yoshiaki; and Fujieda, Masanao, 5,463,430, Cl. 351-208.000.

Nielsen, Peter: *See—*
Stevens-Wright, Debbie; Russo, Massimo; Nielsen, Peter; and Bertram, Paul, 5,462,527, Cl. 604-95.000.

Niemann, Klaus: *See—*
Körber, Joachim; Niemann, Klaus; Frederich, Fritz; and Günther, Christian, 5,463,550, Cl. 364-426.010.

Niessen, Paul: *See—*
Vincze, Albert M.; Seymour, Theodore J.; Culkeen, Patrick; Tang, Nai-Yong; Lewis, Gerald P.; Niessen, Paul; and Marlow, John V., 5,462,109, Cl. 164-479.000.

Nihei, Mitsuo: *See—*
Kimura, Tomoaki; Nihei, Mitsuo; Horii, Kenji; and Yoshimoto, Kenichi, 5,461,770, Cl. 29-527.700.

Niihara, Toshio: *See—*
Miyamoto, Harukazu; Miyamoto, Makoto; Andoo, Keikichi; Niihara, Toshio; and Ojima, Masahiro, 5,462,811, Cl. 428-694.0EC.

Niimi, Masahiro; Hariu, Yukari; Kataura, Koichi; Ishii, Yoshibumi; and Kato, Kazuaki, to Towa Chemical Industry Co., Ltd. Manufacturing method of high purity maltose and its reduced product. 5,462,864, Cl. 435-100.000.

Niimura, Koichi; Ikeda, Yuko; Kato, Akira; and Ando, Takao, to Kureha Chemical Industry Co., Ltd. Azole derivatives, pharmaceutical compositions containing the same, and method for treating mycosis and estrogen-dependent diseases. 5,462,957, Cl. 514-397.000.

Niitsu, Yasuhiko: *See—*
Onoue, Takashi; Araki, Kiyoshi; Ishida, Noriya; Kitamura, Toshiya; Niitsu, Yasuhiko; Yanagisawa, Makiko; Sakamoto, Ryo; and Sato, Fumihiro, 5,462,821, Cl. 429-218.000.

Nikas, Dimitrios; and Merchant, Zaffer S., to Motorola, Inc. Method and apparatus for controlling message transmissions in an acknowledge-back selective call communication system. 5,463,382, Cl. 340-825.440.

Nikon Corporation: *See—*
Ezawa, Akira, 5,463,435, Cl. 354-21.000.
Konishi, Toshio; Horibe, Toshihiko; Yashiro, Toru; Watanabe, Kouji; and Shuin, Toshiya, 5,462,806, Cl. 428-451.000.
Morita, Seiji, 5,463,614, Cl. 369-275.400.
Tanaka, Etsuo; Kai, Tadao; Okano, Hiroshi; Katayama, Akira; and Imura, Yoshio, 5,463,443, Cl. 354-430.000.

Ninomiya, Masayuki: *See—*
Sakamoto, Akihiko; Takahashi, Tadashi; and Ninomiya, Masayuki, 5,462,805, Cl. 428-430.000.

Ninomiya, Takanori: *See—*

Ichinose, Toshiaki; Ninomiya, Takanori; Kuni, Asahiro; Nakahata, Kozo; Hamada, Toshimitsu; and Ayabe, Toshihiko, 5,463,667, Cl. 378-58.000.

Nippon Chemical Industrial Co., Ltd.: *See—*

Ichimura, Shozo; Tabei, Seikichi; and Hashimoto, Michinori, 5,462,693, Cl. 252-190.000.

Nippon Electric Glass Co., Ltd.: *See—*

Sakamoto, Akihiko; Takahashi, Tadashi; and Ninomiya, Masayuki, 5,462,805, Cl. 428-430.000.

Nippon Hoso Kyokai: *See—*

Mitsuyasu, Tamotsu; and Sekiguchi, Takuji, 5,463,506, Cl. 360-77.170.

Nippon Light Metal Co., Ltd.: *See—*

Matsumoto, Jiro; and Yanagisawa, Ikuo, 5,461,768, Cl. 29-509.000.

Nippon Oil Company, Limited: *See—*

Sano, Akira; Shiraishi, Takeichi; Suzuki, Kunihiro; Okamoto, Mitsuo; Usui, Katumi; Shimizu, Hiroyuki; and Matsuura, Kazuo, 5,463,001, Cl. 526-124.500.

Nippon Oil Co., Ltd.: *See—*

Kinoshita, Hirotugu; Nomura, Souichi; and Mishima, Masaru, 5,462,683, Cl. 252-25.000.

Naka, Michiharu; Koizumi, Hideki; Takahashi, Yuzo; Kinoshita, Hirotugu; and Mishima, Masaru, 5,462,684, Cl. 252-51.50R.

Nippon Paint Co., Ltd.: *See—*

Miyazoe, Seigo; Hisai, Tsuneyoshi; Fushimi, Akira; Takeoka, Kazuhiko; Okude, Yoshitaka; and Kurauchi, Takeo, 5,462,770, Cl. 427-407.100.

Nippon Soda Co., Ltd.: *See—*

Sato, Takehiro; Kinosita, Kimiaki; Kaeriyama, Minoru; and Hidaka, Tomoya, 5,463,133, Cl. 568-33.000.

Nippon Steel Corporation: *See—*

Shinjo, Teruya; Yamamoto, Hidefumi; Anno, Toshihiko; and Takada, Toshio, 5,462,795, Cl. 428-332.000.

Nippon Telegraph and Telephone Corporation: *See—*

Awaya, Nobuyoshi; and Arita, Yoshinobu, 5,462,014, Cl. 118-725.000.

Nakata, Naotaro; Aoki, Naofumi; and Okada, Kenji, 5,463,707, Cl. 385-35.000.

Nippon Zeon Co., Ltd.: *See—*

Hosaka, Tohru; Mizuno, Hideharu; Koushima, Yuji; Kohara, Teiji; and Natsuume, Tadao, 5,462,995, Cl. 525-332.100.

Sugawara, Tomoo; Kudo, Shingo; and Okumura, Kin-ichi, 5,463,002, Cl. 526-161.000.

Nippondenso Co., Ltd.: *See—*

Fujii, Tetsuo; and Imai, Masahito, 5,461,916, Cl. 73-514.320.

Kamio, Shigeru; Hara, Mitsuo; and Tasaka, Hitoshi, 5,463,298, Cl. 318-599.000.

Komura, Atushi; Kondo, Kenji; and Kuroyanagi, Akira, 5,462,896, Cl. 437-228.000.

Ushida, Masayasu, 5,462,022, Cl. 123-90.170.

Nishi, Takashi; Matsuda, Masami; Noshita, Kenji; Kikuchi, Makoto; Izumida, Tatsuo; Tamata, Shin; and Kiuchi, Yoshimasa, to Hitachi, Ltd. Method for solidification of waste, and apparatus, waste form, and solidifying material therefor. 5,463,171, Cl. 588-4.000.

Nishida, Junichi; Araki, Morio; Arakawa, Takeharu; Ishida, Tessho; Ayukai, Yasushiro; Baba, Toshiharu; Sakaguchi, Masahiko; Nobe, Kenichi; Kaneko, Michihiro; and Shinohara, Jun, to Pioneer Electronic Corporation. Method of processing information of recording disc and apparatus for processing the same. 5,463,605, Cl. 369-58.000.

Nishida, Kazue: *See—*

Meki, Naoto; Imahase, Tomotoshi; Nishida, Kazue; Fujimoto, Hiroaki; Mikitani, Kenichi; Takano, Hirotaka; Ogasawara, Yoriko; and Tamaki, Masahiro, 5,462,961, Cl. 514-407.000.

Nishida, Kazuto: *See—*

Kanayama, Shinji; Kabeshita, Akira; Nishino, Kenichi; Ohnakada, Satoshi; Murata, Takahiko; Kimura, Kazuhiro; and Nishida, Kazuto, 5,462,626, Cl. 156-272.800.

Nishida, Masato: *See—*

Oshima, Toshio; Ohiwa, Tsunemi; Nishida, Masato; Matsumoto, Taiji; Itoh, Akihiko; and Takeuchi, Yoji, 5,463,212, Cl. 235-468.000.

Nishida, Mitsuhiro: *See—*

Miyazaki, Tsuyoshi; Sanchika, Kouzoh; Nishida, Mitsuhiro; Yasukohchi, Tohru; Kitano, Shigeru; Suginaka, Akinori; and Kadoma, Yoshihito, 5,463,066, Cl. 548-112.000.

Nishiguchi, Masaru: *See—*

Asabe, Kazutaka; Nishiguchi, Masaru; and Yamamoto, Sukeyoshi, 5,462,808, Cl. 428-551.000.

Nishihira, Keigo; and Tanaka, Shuji, to Ube Industries, Ltd. Process for preparing carbamates. 5,463,109, Cl. 560-157.000.

Nishii, Shinji; Wake, Shigeo; and Ogawa, Takeshi, to Sumitomo Chemical Company, Limited. Process for producing 1,4-dicyano-2-butene. 5,463,103, Cl. 558-341.000.

Nishijima, Hideo: *See—*

Kaniwa, Kouji; Nishijima, Hideo; Fujita, Kouji; and Nishimura, Keizo, 5,463,505, Cl. 360-73.040.

Nishikawa, Koichiro, to Canon Kabushiki Kaisha. Two-beam optical head for forming first and second light spots on a recording medium. 5,463,610, Cl. 369-121.000.

Nishikawa Rubber Co., Ltd.: *See—*

Yamane, Tadanao, 5,462,292, Cl. 277-181.000.

Nishikawa, Tetsuo; and Hagiwara, Tatsuya, to Fuji Photo Film Co., Ltd. Semiconductor delay line driven by an input signal-derived reference signal. 5,463,475, Cl. 358-325.000.

Nishimura, Ikuya: *See—*

Yuhta, Toshio; Nishimura, Ikuya; Kano, Daijiro; Saitou, Tsuyoshi; Suzuki, Tomita; and Tanaka, Mamoru, 5,462,362, Cl. 384-13.000.

Nishimura, Keizo: *See—*

Kaniwa, Kouji; Nishijima, Hideo; Fujita, Kouji; and Nishimura, Keizo, 5,463,505, Cl. 360-73.040.

Nishimura, Makoto. Process for brazing metal, and apparatus therefor. 5,462,216, Cl. 228-47.100.

Nishino, Kenichi: *See—*

Kanayama, Shinji; Kabeshita, Akira; Nishino, Kenichi; Ohnakada, Satoshi; Murata, Takahiko; Kimura, Kazuhiro; and Nishida, Kazuto, 5,462,626, Cl. 156-272.800.

Nishioka, Naohiro: *See—*

Tanabe, Kouji; and Nishioka, Naohiro, 5,461,775, Cl. 29-840.000.

Nishita, Satoru: *See—*

Yamamoto, Shigeru; Matsushita, Shigenori; Zhang, Shu H.; Nishita, Satoru; and Nakata, Kazushi, 5,462,122, Cl. 172-2.000.

Nishiyama, Hidetoshi: *See—*

Morioka, Hiroshi; Noguchi, Minori; Ohshima, Yoshimasa; Kembo, Yukio; Nishiyama, Hidetoshi; Matsuoka, Kazuhiko; and Shigyo, Yoshiharu, 5,463,459, Cl. 356-237.000.

Nishiyama, Masanori: *See—*

Chujo, Takao; Hamano, Hisashi; Nishiyama, Masanori; Saeki, Yasuhiro; Ogawa, Tatsuya; and Endou, Kouhei, 5,463,015, Cl. 528-308.200.

Nishizawa, Takatoshi: *See—*

Ohashi, Takashi; Hembo, Motoshi; Nishizawa, Takatoshi; and Sunaga, Isao, 5,462,788, Cl. 428-201.000.

Niskanen, Toivo; and Peltonen, Kari, to A. Ahlstrom Corporation. Method and apparatus for separating gas from a gaseous material. 5,462,585, Cl. 95-261.000.

Nisshin Flour Milling Co., Ltd.: *See—*

Ohwaki, Tatsuya; and Sakai, Hiroshi, 5,462,869, Cl. 435-212.000.

Nisshin Steel Co., Ltd.: *See—*

Uematsu, Yoshihiro; Hiramatsu, Naoto; and Oku, Manabu, 5,462,611, Cl. 148-325.000.

Nissin Kohki Co., Ltd.: *See—*

Kato, Takaaki, 5,463,387, Cl. 341-31.000.

Nistor, Thomas A.: *See—*

Froling, Thomas H.; Nistor, Thomas A.; and Sigety, Stephen, Jr., 5,461,938, Cl. 74-502.400.

Nitescu, Petru N.: *See—*

Plavidal, Richard W.; Nitescu, Petru N.; Mudwilder, Greg; and Crockett, Richard, 5,462,080, Cl. 137-337.000.

Nitsuko Corporation: *See—*

Ohsawa, Shigeru, 5,463,676, Cl. 379-67.000.

Nitta, Tomio; Mifune, Hideo; Seki, Masato; Kaga, Yosimitu; and Serizawa, Noriyuki, to Tokai Corporation. Safety device for use with portable heater. 5,462,044, Cl. 126-262.000.

Nitto Boseki Co., Ltd.: *See—*

Taguchi, Hideo; Shioura, Kozo; and Sugeno, Miwa, 5,462,571, Cl. 65-437.000.

Nitto Denko Corporation: *See—*

Omata, Tetsuo; and Tanida, Kaichi, 5,463,085, Cl. 549-273.000.

Yoshikawa, Takao; and Moriyama, Takaaki, 5,462,977, Cl. 522-160.000.

Nittoli, Frank J., to Advance Car Wash Equipment, Inc. Automatic vehicle washing apparatus. 5,461,745, Cl. 15-97.300.

NKK Corporation: *See—*

Sugiyama, Shunichi; Kametani, Hiroshi; Yoshikoshi, Hideyuki; Ikeda, Nobuaki; and Hara, Tomihiro, 5,462,686, Cl. 252-62.620.

Noack, Wolf-Eckart; Schulz, Paul; and Tuller, F. Norman, to Henkel Kommanditgesellschaft auf Aktien. Process for the production of ether carboxylic acids and salts thereof. 5,463,114, Cl. 562-421.000.

Nobe, Kenichi: *See—*

Nishida, Junichi; Araki, Morio; Arakawa, Takeharu; Ishida, Tessho; Ayukai, Yasushiro; Baba, Toshiharu; Sakaguchi, Masahiko; Nobe, Kenichi; Kaneko, Michihiro; and Shinohara, Jun, 5,463,605, Cl. 369-58.000.

Noda, Shinya: *See—*

Watanabe, Kazushi; Sasaki, Shinichi; Ikemoto, Isao; Miyabe, Shigeo; and Noda, Shinya, 5,463,446, Cl. 355-200.000.

Noel, Jean L. Apparatus for secure positioning over and around a steering wheel and steering column to prevent theft. 5,461,891, Cl. 70-18.000.

NOF Corporation: *See—*

Miyazaki, Tsuyoshi; Sanchika, Kouzoh; Nishida, Mitsuhiro; Yasukohchi, Tohru; Kitano, Shigeru; Suginaka, Akinori; and Kadoma, Yoshihito, 5,463,066, Cl. 548-112.000.

Noguchi, Akio: *See—*

Uchiyama, Seiji; Noguchi, Akio; Ushio, Yukihide; Matsuo, Shinpei; Serizawa, Youji; Takeuchi, Makoto; Yamada, Kazurou; and Kato, Junichi, 5,463,410, Cl. 347-133.000.

Noguchi, Minori: *See—*

Morioka, Hiroshi; Noguchi, Minori; Ohshima, Yoshimasa; Kembo, Yukio; Nishiyama, Hidetoshi; Matsuoka, Kazuhiko; and Shigyo, Yoshiharu, 5,463,459, Cl. 356-237.000.

Nohmi, Yasuhiro; Yamaguchi, Tadashi; Matsuzawa, Kimio; Katagiri, Naoki; and Sakaguchi, Hotaka, to NEC Corporation. Coaxial cable. 5,463,188, Cl. 174-108.000.

Nomura, Souichi: *See—*

Kinoshita, Hirotugu; Nomura, Souichi; and Mishima, Masaru, 5,462,683, Cl. 252-25.000.

Norand Corporation: *See—*

Koenck, Steven E., 5,463,305, Cl. 320-21.000.

- Nordica S.p.A.: *See—*
  - Pozzobon, Alessandro, 5,462,296, Cl. 280-11.200.
- Noritsu Koku Co., Ltd.: *See—*
  - Yamaguchi, Takuji, 5,463,441, Cl. 354-321.000.
- Norling, Brian L., to AlliedSignal Inc. Micromachined thermal switch. 5,463,233, Cl. 257-254.000.
- Norman, Colin F.: *See—*
  - Evans, Christopher M.; Buckingham, Mark R.; and Norman, Colin F., 5,462,823, Cl. 430-14.000.
- Norpac GSE: *See—*
  - Smith, Donald K.; Haddix, Stephen J.; and Blomquist, Randall J., 5,462,238, Cl. 241-243.000.
- Norsk Hydro a.s.: *See—*
  - Sørheim, Ole Johan; Vik, Kai Magne; and Auran, Lars, 5,461,899, Cl. 72-272.000.
- North American Philips Corporation: *See—*
  - Mattas, Charles B., 5,463,284, Cl. 315-240.000.
- Northern Telecom Limited: *See—*
  - Epworth, Richard E., 5,463,487, Cl. 359-124.000.
  - Herscovici, Bernard, 5,463,673, Cl. 379-59.000.
- Northrop Grumman Corporation: *See—*
  - Casey, James A.; and McGill, Robert E., 5,462,055, Cl. 128-653.500.
- Northrop, Paul S., to Mobil Oil Corporation. Scrubbing of oilfield waste gas in subterranean formations. 5,463,165, Cl. 588-250.000.
- Northwestern University: *See—*
  - Razeghi, Manijeh, 5,462,008, Cl. 117-2.000.
- Norton, R. Scott. Drive reversing system for the feeder housing of an combine harvester. 5,462,486, Cl. 460-20.000.
- Norwich Eaton Pharmaceuticals, Inc.: *See—*
  - Yu, Chia-Nien; Pelosi, Stanford S., Jr.; and Calcagno, Mark A., 5,462,940, Cl. 514-235.800.
- Nose, Koichi: *See—*
  - Hayashi, Kenji; Watanabe, Nobuhisa; Nose, Koichi; Tanaka, Hiroshi; Ohtsuka, Issei; Kokushi, Motoji; Hiyoshi, Hironobu; Kobayashi, Hiroko; Yamada, Toshie; and Horie, Toru, 5,462,958, Cl. 514-399.000.
- Noshita, Kenji: *See—*
  - Nishi, Takashi; Matsuda, Masami; Noshita, Kenji; Kikuchi, Makoto; Izumida, Tatsuo; Tamata, Shin; and Kiuchi, Yoshimasa, 5,463,171, Cl. 588-4.000.
- Notohara, Yasuo: *See—*
  - Futami, Motoo; Endo, Tunehiro; Notohara, Yasuo; and Kitayama, Tooru, 5,463,299, Cl. 318-618.000.
- Novacek, Laurel A.; Sharp, Fraser R.; and McLean, Donald A., to Inviro Medical Devices Ltd. Safety syringe needle device with interchangeable and retractable needle platform. 5,462,531, Cl. 604-110.000.
- Novamont S.p.A.: *See—*
  - Bastioli, Catia; Bellotti, Vittorio; Del Tredici, Gianfranco; Montino, Alessandro; and Ponti, Roberto, 5,462,980, Cl. 524-47.000.
  - Bastioli, Catia; Bellotti, Vittorio; Del Tredici, Gianfranco; and Ponti, Roberto, 5,462,981, Cl. 524-47.000.
  - Bastioli, Catia; Lombi, Roberto; Del Tredici, Gianfranco; and Guanella, Italo, 5,462,982, Cl. 524-47.000.
- Novo Nordisk A/S: *See—*
  - Bonnichsen, Frits F.; and Jørgensen, Peter N., 5,462,535, Cl. 604-272.000.
- Novoste Corporation: *See—*
  - Rosen, Jonathan J.; and Larsen, Charles E., 5,462,255, Cl. 251-149.600.
- NSK Ltd.: *See—*
  - Kan, Yoshio; Nakamura, Takeshi; and Akabane, Yukihiro, 5,462,489, Cl. 464-179.000.
  - Matsuki, Masuo; and Ikesue, Haruyuki, 5,461,983, Cl. 102-530.000.
  - Naka, Michiharu; Koizumi, Hideki; Takahashi, Yuzo; Kinoshita, Hirotugu; and Mishima, Masaru, 5,462,684, Cl. 252-51.50R.
  - Okubo, Kiyoshi, 5,461,767, Cl. 29-454.000.
  - Ono, Katsuyasu, 5,463,260, Cl. 307-121.000.
  - Sato, Chuichi; Tsukamoto, Shigemi; and Shinno, Hidenori, 5,462,361, Cl. 384-9.000.
  - Yuhta, Toshio; Nishimura, Ikuya; Kano, Daijiro; Saitou, Tsuyoshi; Suzuki, Tomita; and Tanaka, Mamoru, 5,462,362, Cl. 384-13.000.
- NSK-Warner K.K.: *See—*
  - Wakisaka, Toshiaki; and Nakagomi, Hirofumi, 5,462,138, Cl. 188-77.00R.
- NTT Mobile Communication Network, Inc.: *See—*
  - Tsunoda, Kazuyuki; and Fujisawa, Ichiro, 5,463,368, Cl. 340-309.150.
- Nukada, Katsumi; and Daimon, Katsumi, to Fuji Xerox Co., Ltd. Process for preparing purified hydroxymetal phthalocyanine and electrophotographic photoreceptor using the same. 5,463,041, Cl. 540-139.000.
- Nukada, Katsumi; Imai, Akira; Daimon, Katsumi; Iijima, Masakazu; Mashimo, Kiyokazu; Sakaguchi, Yasuo; and Takegawa, Ichiro, to Fuji Xerox Co., Ltd. Process for producing a dichlorotin phthalocyanine crystal. 5,463,043, Cl. 540-141.000.
- Nukada, Katsumi; Imai, Akira; and Iijima, Masakazu, to Fuji Xerox Co., Ltd. Process for preparing chlorogallium phthalocyanine crystal. 5,463,044, Cl. 540-143.000.
- Nupro Company: *See—*
  - Perusek, Robert V.; Koch, Ulrich H.; and Kalata, Gregory S., 5,462,081, Cl. 137-498.000.
- Nuti, Marco, to Piaggio Veicoli Europei S.p.A. Auxiliary carburetion device in direct fuel injection engines. 5,462,024, Cl. 123-179.140.
- Nutt, Hubert, to Hilti Aktiengesellschaft. Setting tool for threaded rods. 5,461,946, Cl. 81-53.200.
- NWM de Kruithoorn B.V.: *See—*
  - Stuitje, Peter; Harkema, Ronald; and Taal, Cornelie, 5,462,576, Cl. 75-248.000.
- Nyman, Bengt E. Snowboard with dual-acting, interchangeable edges. 5,462,304, Cl. 280-609.000.
- Oami, Toshimasa: *See—*
  - Nagahori, Takeshi; Oami, Toshimasa; and Anzai, Noriko, 5,463,345, Cl. 327-374.000.
- Oberhelman, David L.; and Herriman, Lisa. Beverage container cover. 5,462,168, Cl. 206-457.000.
- Obermeier, Wolfgang: *See—*
  - Baumann, Edgar; Obermeier, Wolfgang; and Werner, Karl, 5,463,467, Cl. 356-446.000.
- Obersteller, Udo: *See—*
  - Manusch, Cristoph; Obersteller, Udo; and Klaassen, Willem, 5,462,633, Cl. 156-577.000.
- OCG Microelectronic Materials, Inc.: *See—*
  - Daraktchiev, Ivan S., 5,462,207, Cl. 222-148.000.
- Ochiai, Tomiaki: *See—*
  - Teraoka, Masao; Ochiai, Tomiaki; and Hasegawa, Mitsuru, 5,462,035, Cl. 123-561.000.
- Oda, Yoshimasa; and Ota, Masato, to Seiko Seiki Kabushiki Kaisha. Grinding wheel spindle assembly. 5,462,470, Cl. 451-294.000.
- Odake, Hidekazu: *See—*
  - Matsushima, Kiyomitsu; Odake, Hidekazu; Ohashi, Tamotsu; and Tsukada, Isamu, 5,462,154, Cl. 198-699.000.
- O'Donnell, Michael J. Compact disc storage and display rack. 5,462,177, Cl. 211-40.000.
- Offenberg, Michael: *See—*
  - Marek, Jiri; Schubert, Dietrich; Baumann, Helmut; Muenzel, Horst; Offenberg, Michael; and Willmann, Martin, 5,461,917, Cl. 73-514.160.
- Ogai, Masahiko: *See—*
  - Nagami, Tetsuo; Ogura, Yoshitsugu; Ogai, Masahiko; Fukushima, Yoshiaki; Inagaki, Shinji; Fukumoto, Kazuhiro; Banno, Kouji; Sakakibara, Yuji; Takada, Yasuo; Ohta, Takashi; Okada, Akane; Yamada, Yukimura; Hayashi, Kiyotaka; Matsuura, Shinji; and Kuroda, Kaz, 5,462,905, Cl. 502-232.000.
- Ogan, Marc; Tomasella, Frank P.; and Tu, Jan-I, to Bracco International B.V. 2,4,6-triiodo-1,3-benzenedicarboxylic acid compounds used as radiolabelling reagents. 5,463,080, Cl. 548-545.000.
- Ogasawara, Yoriko: *See—*
  - Meki, Naoto; Imahase, Tomotoshi; Nishida, Kazue; Fujimoto, Hiroaki; Mikitani, Kenichi; Takano, Hirotaka; Ogasawara, Yoriko; and Tamaki, Masahiro, 5,462,961, Cl. 514-407.000.
- Ogawa, Junji: *See—*
  - Kobayashi, kazuya; Miyasaka, Kiyoshi; and Ogawa, Junji, 5,463,582, Cl. 365-189.050.
- Ogawa, Kouichi, to Mitsubishi Denki Kabushiki Kaisha. Magnetic field correction device with slotted passive shims. 5,463,363, Cl. 335-299.000.
- Ogawa, Shuji: *See—*
  - Kurosawa, Miki; Ogawa, Shuji; Sugahara, Masayuki; Funai, Kiyoshi; Yumura, Takashi; and Yamamoto, Tetsu, 5,463,202, Cl. 219-121.830.
- Ogawa, Tadatoshi: *See—*
  - Hayashida, Haruo; Ichige, Akihiro; Ogawa, Tadatoshi; Yamada, Takeshi; Tada, Teruo; Zenigame, Masaaki; Wano, Toyoki; and Kondo, Kazuo, 5,462,777, Cl. 428-2.000.
- Ogawa, Takeshi: *See—*
  - Nishii, Shinji; Wake, Shigeo; and Ogawa, Takeshi, 5,463,103, Cl. 558-341.000.
- Ogawa, Tatsuya: *See—*
  - Chujo, Takao; Hamano, Hisashi; Nishiyama, Masanori; Saeki, Yasuhiro; Ogawa, Tatsuya; and Endou, Kouhei, 5,463,015, Cl. 528-308.200.
- Ogawa, Yasushi; Schmidt, David; and Dasch, James, to Celtrix Pharmaceuticals, Inc. Transforming growth factor β2,3. 5,462,925, Cl. 514-12.000.
- Ogino, Katsuhiko: *See—*
  - Takano, Kiyotaka; Fusegawa, Izumi; Yamagishi, Hirotoshi; Mizuishi, Koji; and Ogino, Katsuhiko, 5,462,010, Cl. 117-14.000.
- Ogletree, Richard: *See—*
  - Chandrasekaran, Kugalur S.; Mills, Daniel M.; and Ogletree, Richard, 5,462,364, Cl. 384-111.000.
- Oguma, Yoshio: *See—*
  - Ikeda, Shigeru; and Oguma, Yoshio, 5,461,737, Cl. 5-475.000.
- Ogura, Kuniaki; Ishikawa, Hiroyuki; Maeda, Yoshiaki; and Komamura, Kouichi, to Kawasaki Steel Corporation. Water-atomized iron powder and method. 5,462,577, Cl. 75-345.000.
- Ogura, Toshihiko: *See—*
  - Umemura, Masaya; Ogura, Toshihiko; Osaka, Hideki; and Shinozaki, Masatsugu, 5,462,442, Cl. 439-69.000.
- Ogura, Tsuneo; Watanabe, Kiminori; Nakagawa, Akio; Yamaguchi, Yoshihiro; Yasuhara, Norio; Matsudai, Tomoko; Hasegawa, Shigeru; and Nakayama, Kazuya, to Kabushiki Kaisha Toshiba. Method of operating thyristor with insulated gates. 5,463,231, Cl. 257-138.000.
- Ogura, Yoshitsugu: *See—*
  - Nagami, Tetsuo; Ogura, Yoshitsugu; Ogai, Masahiko; Fukushima, Yoshiaki; Inagaki, Shinji; Fukumoto, Kazuhiro; Banno, Kouji; Sakakibara, Yuji; Takada, Yasuo; Ohta, Takashi; Okada, Akane; Yamada, Yukimura; Hayashi, Kiyotaka; Matsuura, Shinji; and Kuroda, Kaz, 5,462,905, Cl. 502-232.000.

- Oh, Chang H.: *See—*
  - Cho, Jung H.; Oh, Chang H.; and Nam, Ki H., 5,463,046, Cl. 540-350.000.
- Oh, Dong Y.: *See—*
  - Kim, Jung C.; Oh, Dong Y.; Choe, Gyu S.; Hong, Kyung S.; Kim, Kyung H.; Lee, Joo H.; Lee, Ha I.; Park, Kyeong B.; Gil, Dong S.; Kwon, Oh H.; and Kwon, Byoung H., 5,461,886, Cl. 68-3.0SS.
- Oh, Hun S.: *See—*
  - Kim, Yong Z.; Oh, Hun S.; Yeo, Jae H.; Lim, Jong C.; Bang, Chan S.; Kim, Won S.; and Yim, Hyeon J., 5,462,935, Cl. 514-206.000.
- Ohashi, Takashi; Hembo, Motoshi; Nishizawa, Takatosni; and Sunaga, Isao, to Oji Yuka Goseishi Co., Ltd. Thermoplastic resin film having excellent printability. 5,462,788, Cl. 428-201.000.
- Ohashi, Tamotsu: *See—*
  - Matsushima, Kiyomitsu; Odake, Hidekazu; Ohashi, Tamotsu; and Tsukada, Isamu, 5,462,154, Cl. 198-699.000.
- Ohgane, Takao: *See—*
  - Sumikawa, Michito; Koguchi, Yoshihito; Ohgane, Takao; Irie, Yasuo; and Takahashi, Satoji, 5,463,116, Cl. 562-450.000.
- Ohio State University Research Foundation, The: *See—*
  - Epstein, Arthur J.; Roe, Mitchell G.; Ginder, John M.; Hajiseyedjavadi, Hamid; and Joo, Jinsoo, 5,463,014, Cl. 528-210.000.
- Ohiwa, Tsunemi: *See—*
  - Oshima, Toshio; Ohiwa, Tsunemi; Nishida, Masato; Matsumoto, Taiji; Itoh, Akihiko; and Takeuchi, Yoji, 5,463,212, Cl. 235-468.000.
- Ohki, Yuzuru: *See—*
  - Yashiki, Yuichi; Hondumi, Masahiko; Ohki, Yuzuru; Ito, Takashi; Nakjajima, Fumitaka; Mori, Masakazu; Aoki, Takayoshi; Mizuishi, Harumitsu; and Shibuya, Yuusaku, 5,463,456, Cl. 355-299.000.
- Ohkubo, Hitoshi: *See—*
  - Shibazaki, Osamu; and Ohkubo, Hitoshi, 5,462,710, Cl. 264-297.200.
- Ohkubo, Masaharu: *See—*
  - Yamada, Hiromichi; Ohkubo, Masaharu; Ojima, Masaki; Sasame, Hiroshi; Kawana, Takashi; Seto, Kaoru; Mano, Hiroshi; Saito, Tetsuo; Kashihara, Atsushi; and Ito, Michio, 5,463,473, Cl. 358-300.000.
- Ohlson, Björn: *See—*
  - Samelius, Anders; Ohlson, Björn; and Lindström, Stefan, 5,462,293, Cl. 279-4.030.
- Ohnaka, Hidemi: *See—*
  - Itou, Takaaki; Tanaka, Hiroshi; Takeda, Keiso; Ohnaka, Hidemi; Kunitake, Kazuhisa; and Tanahashi, Toshio, 5,461,857, Cl. 60-276.000.
- Ohnakada, Satoshi: *See—*
  - Kanayama, Shinji; Kabeshita, Akira; Nishino, Kenichi; Ohnakada, Satoshi; Murata, Takahiko; Kimura, Kazuhiro; and Nishida, Kazuto, 5,462,626, Cl. 156-272.800.
- Ohnishi, Hiroshi: *See—*
  - Matsuoka, Akihiko; Ohnishi, Hiroshi; Kunieda, Yoshinori; Misaizu, Kouei; and Yamamoto, Yuuri, 5,463,627, Cl. 370-105.100.
- Ohnishi, Takao; Osugi, Yukihisa; and Muto, Miyuki, to NGK Insulators, Ltd. Method of and apparatus for inspecting honeycomb-shaped object having plural through holes. 5,463,462, Cl. 356-354.000.
- Ohno Co., Ltd.: *See—*
  - Sadayoshi, Kaju, 5,461,996, Cl. 112-80.300.
- Ohsawa, Shigeru, to Nitsuko Corporation. Key telephone system with a voice storage equipment. 5,463,676, Cl. 379-67.000.
- Ohshima, Naoto: *See—*
  - Asami, Masahiro; Ohshima, Naoto; and Otani, Shigeaki, 5,462,850, Cl. 430-569.000.
- Ohshima, Yoshimasa: *See—*
  - Morioka, Hiroshi; Noguchi, Minori; Ohshima, Yoshimasa; Kembo, Yukio; Nishiyama, Hidetoshi; Matsuoka, Kazuhiko; and Shigyo, Yoshiharu, 5,463,459, Cl. 356-237.000.
- Ohsumi, Koji: *See—*
  - Iino, Yukio; Ishii, Makoto; Ohsumi, Koji; and Tsuji, Takashi, 5,463,078, Cl. 548-541.000.
- Ohta, Eiji: *See—*
  - Funada, Masahiro; Ohta, Ken-ichi; Takaragi, Yoichi; and Ohta, Eiji, 5,463,469, Cl. 358-296.000.
- Ohta, Hiroshi: *See—*
  - Kitaguchi, Yuko; and Ohta, Hiroshi, 5,463,729, Cl. 395-161.000.
- Ohta, Ken-ichi: *See—*
  - Funada, Masahiro; Ohta, Ken-ichi; Takaragi, Yoichi; and Ohta, Eiji, 5,463,469, Cl. 358-296.000.
- Ohta, Masashi: *See—*
  - Yoshida, Hiroaki; Ohta, Masashi; and Nakamura, Akira, 5,462,343, Cl. 303-114.100.
- Ohta, Shun, to Mitsubishi Denki Kabushiki Kaisha. Programmable controller and method of monitoring a sequence program thereof. 5,463,544, Cl. 364-147.000.
- Ohta, Takashi: *See—*
  - Nagami, Tetsuo; Ogura, Yoshitsugu; Ogai, Masahiko; Fukushima, Yoshiaki; Inagaki, Shinji; Fukumoto, Kazuhiro; Banno, Kouji; Sakakibara, Yuji; Takada, Yasuo; Ohta, Takashi; Okada, Akane; Yamada, Yukimura; Hayashi, Kiyotaka; Matsuura, Shinji; and Kuroda, Kaz, 5,462,905, Cl. 502-232.000.
- Ohta, Tsuyoshi: *See—*
  - Yagi, Shigeru; Ono, Masato; Higashi, Taketoshi; Ohta, Tsuyoshi; and Fukuda, Yuzuru, 5,462,827, Cl. 430-65.000.
- Ohta, Yoshiteru: *See—*
  - Akahori, Kingo; Ohta, Yoshiteru; Omura, Takashi; Fujita, Mahito; and Harada, Naoki, 5,463,032, Cl. 534-642.000.
- Ohtsuka, Issei: *See—*
  - Hayashi, Kenji; Watanabe, Nobuhisa; Nose, Koichi; Tanaka, Hiroshi; Ohtsuka, Issei; Kokushi, Motoji; Hiyoshi, Hironobu; Kobayashi, Hiroko; Yamada, Toshie; and Horie, Toru, 5,462,958, Cl. 514-399.000.
- Ohuchi, Kazuya: *See—*
  - Toriumi, Akira; Shigyo, Naoyuki; Wada, Tetsunori; Tanimoto, Hiroyoshi; Ohuchi, Kazuya; and Yoshimi, Makoto, 5,463,234, Cl. 257-296.000.
- Ohwaki, Tatsuya; and Sakai, Hiroshi, to Nisshin Flour Milling Co., Ltd. Human endothelin converting enzyme isolated from blood or placenta by hydrated density. 5,462,869, Cl. 435-212.000.
- Oikawa, Hideyuki: *See—*
  - Kai, Osamu; Muroi, Junichi; Suzuki, Nobuo; Takagi, Tatsumi; Sakata, Shigekazu; and Oikawa, Hideyuki, 5,463,679, Cl. 379-145.000.
- Oiles Corporation: *See—*
  - Maeda, Takashi; Furukido, Takeshi; Hoshino, Kousaku; Udo, Satoru; and Izumi, Masayoshi, 5,462,291, Cl. 277-100.000.
- Oji Yuka Goseishi Co., Ltd.: *See—*
  - Ohashi, Takashi; Hembo, Motoshi; Nishizawa, Takatoshi; and Sunaga, Isao, 5,462,788, Cl. 428-201.000.
- Ojima, Masahiro: *See—*
  - Miyamoto, Harukazu; Miyamoto, Makoto; Andoo, Keikichi; Niihara, Toshio; and Ojima, Masahiro, 5,462,811, Cl. 428-694.0EC.
- Ojima, Masaki: *See—*
  - Yamada, Hiromichi; Ohkubo, Masaharu; Ojima, Masaki; Sasame, Hiroshi; Kawana, Takashi; Seto, Kaoru; Mano, Hiroshi; Saito, Tetsuo; Kashihara, Atsushi; and Ito, Michio, 5,463,473, Cl. 358-300.000.
- Oka, Nobuyuki; Sato, Toshio; and Mizuki, Masayuki, to Sony Corporation. Reproducing apparatus which can play multiple types of discs and biases focusing error signal based on disc type. 5,463,602, Cl. 369-44.290.
- Oka, Tohru; Harada, Chikao; and Suzuki, Hidenori, to Colin Corporation. Medical communication system. 5,462,051, Cl. 128-630.000.
- Okada, Akane: *See—*
  - Nagami, Tetsuo; Ogura, Yoshitsugu; Ogai, Masahiko; Fukushima, Yoshiaki; Inagaki, Shinji; Fukumoto, Kazuhiro; Banno, Kouji; Sakakibara, Yuji; Takada, Yasuo; Ohta, Takashi; Okada, Akane; Yamada, Yukimura; Hayashi, Kiyotaka; Matsuura, Shinji; and Kuroda, Kaz, 5,462,905, Cl. 502-232.000.
- Okada, Hiroaki: *See—*
  - Watanabe, Makoto; Mochizuki, Isao; Sato, Yoshitsugu; Takagi, Takeyuki; and Okada, Hiroaki, 5,463,195, Cl. 200-5.00A.
- Okada, Hiroyuki: *See—*
  - Shintani, Dai; Okada, Hiroyuki; Hoda, Takeo; Izumi, Shuji; Mukai, Hiromu; Hatamori, Osamu; and Tsuji, Sadafusa, 5,463,436, Cl. 354-81.000.
- Okada, Jouji; Kawamata, Akira; Tokunaga, Tadayuki; Torizuka, Makoto; and Asahi, Masahiko, to Kao Corporation. Fluorine-modified silicone, process for preparing the same, and cosmetics containing the same. 5,463,009, Cl. 528-15.000.
- Okada, Junji, to Fuji Xerox Co., Ltd. Process for manufacturing a semiconductor device using NH_4OH-H_2O_2 based etchant for Ti based thin film. 5,462,891, Cl. 437-187.000.
- Okada, Kenji: *See—*
  - Nakata, Naotaro; Aoki, Naofumi; and Okada, Kenji, 5,463,707, Cl. 385-35.000.
- Okada, Minoru: *See—*
  - Tamazawa, Kazuharu; Kojima, Tadao; Arima, Hideki; Murakami, Yukiyasu; Isomura, Yasuo; Okada, Minoru; Takanobu, Kiyoshi; and Takenaka, Toichi, 5,463,064, Cl. 546-281.000.
- Okami, Yoshinori: *See—*
  - Sotoyanagi, Osamu; Okami, Yoshinori; and Takahashi, Naoya, 5,463,771, Cl. 395-600.000.
- Okamoto, Etsurou: *See—*
  - Yamamoto, Ryoichi; Nakao, Fujimasa; Okamoto, Etsurou; and Yagi, Yasuhiko, 5,463,113, Cl. 562-414.000.
- Okamoto, Kouhei, to NEC Corporation. DC/DC converter and RS-232 interface circuit using the same. 5,463,542, Cl. 363-60.000.
- Okamoto, Mitsuo: *See—*
  - Sano, Akira; Shiraishi, Takeichi; Suzuki, Kunihiro; Okamoto, Mitsuo; Usui, Katumi; Shimizu, Hiroyuki; and Matsuura, Kazuo, 5,463,001, Cl. 526-124.500.
- Okamura, Okiyoshi; Sakai, Katsuma; and Yoshimura, Mitsunori, to Koa Oil Company, Ltd. Air cell. 5,462,816, Cl. 429-18.000.
- Okano, Hiroshi: *See—*
  - Tanaka, Etsuo; Kai, Tadao; Okano, Hiroshi; Katayama, Akira; and Imura, Yoshio, 5,463,443, Cl. 354-430.000.
- Okano, Shigeo: *See—*
  - Fukumoto, Takehiko; Iwai, Daisuke; Okano, Shigeo; Suzuki, Hiroshi; and Oshima, Mitsuyoshi, 5,463,149, Cl. 570-135.000.
- Okazaki, Hiroshi, to NEC Corporation. Fuzzy inference operation method and a device therefor. 5,463,719, Cl. 395-51.000.
- Okeda, Yoshiki: *See—*
  - Yuasa, Yoshifumi; Okeda, Yoshiki; Tachikawa, Akio; Nagakura, Akira; and Tsuruta, Haruki, 5,463,118, Cl. 562-502.000.
- Okesaku, Masahiro, to Hokuriku Seikei Industrial Co., Ltd. Picking device with selected spools for a water-jet loom. 5,462,095, Cl. 139-435.400.
- Oki Electric Industry Co., Ltd.: *See—*
  - Chen, Shih-Chang, 5,462,895, Cl. 437-200.000.
  - Fukasawa, Atsushi; Kawabe, Manabu; Kawahashi, Akiyoshi; and Sato, Takuro, 5,463,660, Cl. 375-205.000.

Isobe, Minoru; Yoshimura, Koutaro; and Togashi, Shigemi, 5,462,375, Cl. 400-680.000.

Oki, Tetsuro; Harada, Koichiro; Neki, Ryuichi; Kawakami, Kazuo; Miyata, Tsuyoshi; and Matsuo, Kozo, to Rohm Co., Ltd. Method of manufacturing semiconductor elements without burrs. 5,462,900, Cl. 437-249.000.

Oku, Manabu: *See—*

Uematsu, Yoshihiro; Hiramatsu, Naoto; and Oku, Manabu, 5,462,611, Cl. 148-325.000.

Okubo, Kiyoshi, to NSK Ltd. Manufacturing method of metal bellows. 5,461,767, Cl. 29-454.000.

Okude, Yoshitaka: *See—*

Miyazoe, Seigo; Hisai, Tsuneyoshi; Fushimi, Akira; Takeoka, Kazuhiko; Okude, Yoshitaka; and Kurauchi, Takeo, 5,462,770, Cl. 427-407.100.

Okumura, Kin-ichi: *See—*

Sugawara, Tomoo; Kudo, Shingo; and Okumura, Kin-ichi, 5,463,002, Cl. 526-161.000.

Okuno, Satoshi: *See—*

Inoue, Kazuhiro; Ito, Teruomi; Okuno, Satoshi; and Aono, Katsutoshi, 5,463,022, Cl. 530-322.000.

Okutsu, Hirokazu: *See—*

Watanabe, Naoki; Okutsu, Hirokazu; Isozaki, Masakazu; and Inoue, Kenji, 5,463,444, Cl. 355-27.000.

Oldham, Keith: *See—*

Bruneau, Pierre A. R.; Crawley, Graham C.; and Oldham, Keith, 5,462,953, Cl. 514-379.000.

Oldham, Susan L.; and Rosengard, Jordan L., to Hughes Aircraft Company. Microwave bonding of styrofoam with phenol-formaldehyde compounds. 5,462,627, Cl. 156-275.700.

Olesker, Alice: *See—*

Bischoff, Erwin; Gao, Zhan; Wohlfeil, Stefan; Hecker, Gabriele; Cleophax, Jeannine; Dubreuil, Didier; Gero, Stéphane; Olesker, Alice; Verre-Sebrie, Catherine; Vieira de Almeida, Mauro; and Vass, Georges, 5,463,087, Cl. 549-336.000.

Oliver Products Company: *See—*

Petersen, Bernard L.; Ledford, Alan M.; and Kruse, Gary L., 5,461,956, Cl. 83-221.000.

Olm, Myra T.: *See—*

Kuromoto, Traci Y.; Bell, Eric L.; McDugle, Woodrow G.; Eachus, Raymond S.; Puckett, Sherrill A.; Olm, Myra T.; and Wilson, Robert D., 5,462,849, Cl. 430-567.000.

Olsen, Robert W.: *See—*

Haworth, William S.; Olsen, Robert W.; and Goodin, Mark S., 5,462,619, Cl. 156-172.000.

Olstowski, Franek. Circular saws with laser guides for more precise movement during cutting. 5,461,790, Cl. 30-391.000.

Olympus Optical Co., Ltd.: *See—*

Kaneko, Nobuyuki; and Katsuhara, Wataru, 5,463,606, Cl. 369-59.000.

Sakurai, Tomohisa; Nagaoka, Yukiko; Kubota, Tetsumaru; and Ikeda, Yuichi, 5,462,522, Cl. 604-22.000.

Omata, Tetsuo; and Tanida, Kaichi, to Nitto Denko Corporation. Synthesis method of physiologically active delta-lactone. 5,463,085, Cl. 549-273.000.

Omura, Takashi: *See—*

Akahori, Kingo; Ohta, Yoshiteru; Omura, Takashi; Fujita, Mahito; and Harada, Naoki, 5,463,032, Cl. 534-642.000.

O'Neill, Andrew J.: *See—*

Dumont, Kenneth R.; O'Neill, Andrew J.; and Davies, Scott T., 5,463,706, Cl. 385-32.000.

O'Neill, Victoria A.: *See—*

Evenstad, Kenneth L.; O'Neill, Victoria A.; and Gorham, Thomas R., 5,462,740, Cl. 424-436.000.

Ono, Katsuyasu, to NSK Ltd. Trigger device for triggering a passive restraint device in a car. 5,463,260, Cl. 307-121.000.

Ono, Masato: *See—*

Yagi, Shigeru; Ono, Masato; Higashi, Taketoshi; Ohta, Tsuyoshi; and Fukuda, Yuzuru, 5,462,827, Cl. 430-65.000.

Ono, Tetsuo; Mizutani, Tatsumi; and Suzuki, Keizo, to Hitachi, Ltd. Surface processing method and an apparatus for carrying out the same. 5,462,635, Cl. 216-67.000.

Onodera, Takashi: *See—*

Maruyama, Takumi; Onodera, Takashi; Hatakenaka, Nobuko; Uno, Hiroaki; and Yokoshi, Noriyuki, 5,463,663, Cl. 375-356.000.

Onoue, Takashi; Araki, Kiyoshi; Ishida, Noriya; Kitamura, Toshiya; Niitsu, Yasuhiko; Yanagisawa, Makiko; Sakamoto, Ryo; and Sato, Fumihiro, to Dowa Mining Co., Ltd. Gallium based active material for the negative electrode, a negative electrode using the same, and batteries using said negative electrode. 5,462,821, Cl. 429-218.000.

Onuma, Yoshio; and Hamasaki, Katsuyoshi, to Shinko Electric Industries Co., Ltd. Fabrication method of superconducting quantum interference device constructed from short weak links with ultrafine metallic wires. 5,462,762, Cl. 427-63.000.

Oowaki, Yukihito; and Hasegawa, Takehiro, to Kabushiki Kaisha Toshiba. Semiconductor memory. 5,463,577, Cl. 365-63.000.

O'Patka, Dennis J.; Williamson, Craig C.; Meyer, Burton C.; and Wildman, John R. Game with animated character. 5,462,285, Cl. 273-459.000.

Oppermann, Günter: *See—*

Podszun, Wolfgang; Bloodworth, Robert; and Oppermann, Günter, 5,462,687, Cl. 252-79.000.

Opresco, Ovidiu, to Weatherchem Corporation. Screws-on child resistant consumer-friendly closure. 5,462,182, Cl. 215-216.000.

Opti, Inc.: *See—*

Ghosh, Subir K.; and Bhattacharya, Dipankar, 5,463,759, Cl. 395-461.000.

Optical Sensors Incorporated: *See—*

Kane, James; Martin, Roy; and Schilling, Anne, 5,462,880, Cl. 436-138.000.

Orascoptic Research, Inc.: *See—*

Buchroeder, Richard A., 5,463,500, Cl. 359-744.000.

Origin Medsystems, Inc.: *See—*

Gresl, Charles, 5,462,532, Cl. 604-164.000.

Orka Optik GmbH: *See—*

Heyler, Adolf, 5,461,915, Cl. 73-431.000.

Orlandi, Ireneo: *See—*

Zacche', Vanni; Orlandi, Ireneo; and Pedercini, Maurizio, 5,462,632, Cl. 156-566.000.

Orlowski, Thomas E.: *See—*

Swift, Joseph A.; and Orlowski, Thomas E., 5,462,773, Cl. 427-555.000.

Ort, Oswald; Bauer, Klaus; and Bieringer, Hermann, to Hoechst Aktiengesellschaft. Arylsulfonylureas, processes for their preparation, and their use as herbicides and growth regulators. 5,463,081, Cl. 549-13.000.

Osaka, Hideki: *See—*

Umemura, Masaya; Ogura, Toshihiko; Osaka, Hideki; and Shinozaki, Masatsugu, 5,462,442, Cl. 439-69.000.

Osaka-shi: *See—*

Hara, Koji; Fujita, Koki; Kuwahara, Nobuhiro; Kitahata, Sumio; and Koizumi, Kyoko, 5,463,039, Cl. 536-124.000.

Osaki, Shigemasa: *See—*

Hu, Chen-Ze; Dolence, Eric K.; Osaki, Shigemasa; and Sanders, Clifton G., 5,463,010, Cl. 528-25.000.

Osborn, Lloyd J. Auxiliary door lock for an outwardly opening door. 5,462,321, Cl. 292-288.000.

Osborne, James L.: *See—*

Enscore, David J.; Campbell, Patricia S.; Osborne, James L.; Smart, Melinda K.; and Yum, Su I., 5,462,745, Cl. 424-448.000.

Oshima, Mitsuyoshi: *See—*

Fukumoto, Takehiko; Iwai, Daisuke; Okano, Shigeo; Suzuki, Hiroshi; and Oshima, Mitsuyoshi, 5,463,149, Cl. 570-135.000.

Oshima, Toshio; Ohiwa, Tsunemi; Nishida, Masato; Matsumoto, Taiji; Itoh, Akihiko; and Takeuchi, Yoji, to Hitachi Maxell, Ltd. Latent image forming member and method of manufacturing, latent image reading apparatus and latent image reading system. 5,463,212, Cl. 235-468.000.

Ostrover, Lewis S.: *See—*

Cookson, Christopher J.; and Ostrover, Lewis S., 5,463,565, Cl. 364-514.00R.

Osugi, Yukihisa: *See—*

Ohnishi, Takao; Osugi, Yukihisa; and Muto, Miyuki, 5,463,462, Cl. 356-354.000.

Ota, Atushi: *See—*

Hasegawa, Tamotsu; Arakawa, Yasuyuki; and Ota, Atushi, 5,462,107, Cl. 164-63.000.

Ota, Hiroyuki: *See—*

Takei, Toshiaki; Kayamori, Satoshi; and Ota, Hiroyuki, 5,462,985, Cl. 524-204.000.

Ota, Manabu: *See—*

Iwata, Toshinori; and Ota, Manabu, 5,462,085, Cl. 137-625.430.

Ota, Masato: *See—*

Oda, Yoshimasa; and Ota, Masato, 5,462,470, Cl. 451-294.000.

Otaka, Tadashi; Mori, Hiroyoshi; and Todokoro, Hideo, to Hitachi, Ltd. Electron beam measuring apparatus. 5,463,221, Cl. 250-310.000.

Otani, Shigeaki, to Fuji Photo Film Co., Ltd. Silver halide color photographic material. 5,462,847, Cl. 430-508.000.

Otani, Shigeaki: *See—*

Asami, Masahiro; Ohshima, Naoto; and Otani, Shigeaki, 5,462,850, Cl. 430-569.000.

Otomo, Shigekazu; Kumasaka, Noriyuki; Shiiki, Kazuo; Yamashita, Takeo; Saito, Noritoshi; and Tarutani, Yoshinobu, to Hitachi, Ltd. Magnetic head and magnetic recording and reproducing apparatus using a superconducting quantum interference device. 5,463,518, Cl. 505-171.000.

O'Toole, Terrence R.: *See—*

Baum, Thomas H.; Mukherjee, Shyama P.; O'Toole, Terrence R.; Tai, Alice F.; and Viehbeck, Alfred, 5,462,897, Cl. 437-230.000.

Otsuka Kagaku Kabushiki Kaisha: *See—*

Ishikawa, Yoshio, 5,462,778, Cl. 428-17.000.

Otsuka, Kengo: *See—*

Fukazawa, Nobuyuki; Suzuki, Tsuneji; Kawauchi, Nobuya; Komatsu, Hironori; Otsuka, Kengo; and Nakajima, Yuki, 5,463,061, Cl. 546-158.000.

Ott, Herbert: *See—*

Bullmer, Wolfgang; Kronenberg, Klemens; and Ott, Herbert, 5,462,501, Cl. 477-155.000.

Ottesen, Hal H., to International Business Machines Corporation. System and method for reducing seek time for read operations in mirrored DASD files. 5,463,758, Cl. 395-441.000.

Ottestad Breathing Systems AS: *See—*

Ottestad, Nils T., 5,461,901, Cl. 73-4.00R.

Ottestad, Nils T., to Ottestad Breathing Systems AS. Testing apparatus for pressure gauges implementing pneumatic feedback to control stepless regulating valve. 5,461,901, Cl. 73-4.00R.

Ou, John D. Y., to Exxon Chemical Patents Inc. Mercury removal by dispersed-metal adsorbents. 5,463,167, Cl. 585-823.000.

Outboard Marine Corporation: *See—*

Ming, Lam H., 5,462,464, Cl. 440-88.000.

Ovadia, Bat-Sheva: *See—*
Wertheizer, Gideon; Be'ery Yair; Ovadia, Bat-Sheva; Gross, Yael; Perets, Ronen; and Milstein, Yakov, 5,463,749, Cl. 395-437.000.

Ovadia, Shmuel. System for conversion of sea wave energy. 5,461,862, Cl. 60-641.900.

Owens-Illinois Closure Inc.: *See—*
Gregory, James L.; Burzynski, Dennis J.; Rote, Bruce J.; and Sprowl, Frank L., 5,462,187, Cl. 215-350.000.
Haffner, Eugene F.; and Rios, Luz, 5,462,202, Cl. 222-109.000.
Ingram, Keith W.; and Crowley, Daniel J., Jr., 5,462,184, Cl. 215-252.000.

Oximberg, Carol A. AC motor controller with 180 degree conductive switches. 5,463,300, Cl. 318-801.000.

Oya, Kazuhiro, to Fuji Xerox Co., Ltd. Image processing system. 5,463,476, Cl. 358-426.000.

Oyama, Takamasa; Kato, Masao; and Miwa, Michio, to Matsushita Electric Industrial Co., Ltd. Method and apparatus for measuring a distance of a route in a solid figure. 5,463,568, Cl. 364-561.000.

Ozawa, Masaki: *See—*
Kobuke, Yoshiaki; Togashi, Akio; Ozawa, Masaki; and Watanabe, Masayuki, 5,463,099, Cl. 556-117.000.

Ozawa, Takeshi: *See—*
Doi, Toshiya; Ozawa, Takeshi; Tanaka, Kazuhide; Yuasa, Toyotaka; Kamo, Tomoichi; and Matsuda, Shinpei, 5,462,922, Cl. 505-785.000.

Oztaskin, Ali S.: *See—*
Kundu, Aniruddha; and Oztaskin, Ali S., 5,463,744, Cl. 395-375.000.

P.I.D. Rauch Industrial Design Ltd.: *See—*
Rauch, Joseph A., 5,461,782, Cl. 30-47.000.

P.J. Van Ouwerkerk Holding B.V.: *See—*
Van Ouwerkerk, Pieter J., 5,462,230, Cl. 239-428.500.

P.T. Djarum, Bagian Produski Cerutu, Per Wakilan: *See—*
Rahardja, Budianto, 5,462,070, Cl. 131-76.000.

P T Sub Inc.: *See—*
Mirle, Srinivas K.; and Williams, Trevor J., 5,462,835, Cl. 430-287.000.

Pace, Gary L.: *See—*
Berry, James E.; Pace, Gary L.; Herold, Barry W.; McLaughlin, Kevin; and Graham-Meighan, Margaret, 5,463,306, Cl. 323-222.000.

Pache, Rémy, to Eta SA Fabriques d'Ebauches. Receiver for local calls with low energy consumption. 5,463,383, Cl. 340-825.440.

Pacofsky, Gregory J.: *See—*
Fevig, John M.; Abelman, Matthew M.; Amparo, Eugene C.; Cacciola, Joseph; Kettner, Charles A.; Pacofsky, Gregory J.; and Wang, Chia-Lin, 5,462,964, Cl. 514-423.000.

Paff, Thomas J.: *See—*
Street, David G.; Paff, Thomas J.; Thomas, Dean A.; and McGlynn, Joseph P., 5,462,316, Cl. 285-81.000.

Pagallo, Giulia: *See—*
Beemink, Ernest H.; Pagallo, Giulia; and Bozinovic, Radmilo, 5,463,696, Cl. 382-186.000.

Page, Lew B. Drum crusher. 5,461,973, Cl. 100-53.000.

Pagotto, Jack: *See—*
Liang, Septimus H.-C.; Harrison, Brian H.; and Pagotto, Jack, 5,462,908, Cl. 502-401.000.

Paige, Martin G. Pressurized steam heated cooking pan. 5,462,045, Cl. 126-378.000.

Paik, Yi H.; Simon, Ethan S.; and Swift, Graham, to Rohm and Haas Company. Process for preparing polysuccinimides from maleamic acid. 5,463,017, Cl. 528-361.000.

Paine, Anthony J.: *See—*
Moffat, Karen A.; Pontes, Fatima M.; Paine, Anthony J.; McAneney, Brian; and Puri, Paul, 5,462,828, Cl. 430-106.000.

Pajerski, A. Victor: *See—*
Patrick, Edward P.; and Pajerski, A. Victor, 5,462,609, Cl. 148-241.000.

Pakusch, Joachim: *See—*
Penzel, Erich; Franzmann, Gernot; Angel, Maximilian; Pakusch, Joachim; and Schuler, Bernhard, 5,462,978, Cl. 523-342.000.

Pall Corporation: *See—*
Hopkins, Scott D.; and Pierce, Timothy P., 5,462,675, Cl. 210-767.000.
Wollinsky, Kurt H.; and Saefkow, Michael W. K., 5,462,667, Cl. 210-645.000.

Palm, Christof: *See—*
Becker, Rainer; Huellmann, Michael; Palm, Christof; and Franzischka, Wolfgang, 5,463,020, Cl. 528-408.000.

Palmer, James K. FM band multiple signal modulator. 5,463,356, Cl. 332-117.000.

Palmer, Yvette L.: *See—*
Skotnicki, Jerauld S.; and Palmer, Yvette L., 5,463,048, Cl. 540-456.000.

Palmieri, Costantino: *See—*
Guzzi, Umberto; Palmieri, Costantino; and Croci, Tiziano, 5,462,945, Cl. 514-277.000.

Pan, Jing-Jong, to United States of America, Air Force. Broadband multiwavelength narrow linewidth laser source using an electro-optic modulator. 5,463,647, Cl. 372-12.000.

Pannone, John L., to United Technologies Corporation. Compressor stator vane assembly. 5,462,403, Cl. 415-173.100.

Panontin, Renzo; and Del Ben, Ivo, to G.P.E. S.R.L. Photographic material advancement adaptation unit for plant for continuous development of photographic material. 5,463,440, Cl. 354-298.000.

Panosh, Richard: *See—*
Rapoport, Uri; and Panosh, Richard, 5,462,054, Cl. 128-653.500.

Papadakis, Emmanuel P.; Russell, Steve F.; and Wormley, Samuel J., to Iowa State University Research Foundation, Inc. Direct-sequence spread-spectrum ultrasonic testing device. 5,461,921, Cl. 73-628.000.

Papenfuhs, Theodor; Kanschik-Conradsen, Andreas; and Pressler, Wilfried, to Hoechst Aktiengesellschaft. Process for the preparation of chlorofluoronitrobenzenes. 5,463,148, Cl. 568-938.000.

Papenfuhs, Theodor: *See—*
Kanschik-Conradsen, Andreas; and Papenfuhs, Theodor, 5,463,135, Cl. 568-331.000.

Papineschi, Thierry: *See—*
Gaillard, Christian; and Papineschi, Thierry, 5,462,258, Cl. 256-13.100.

Pappas, Michael J.; and Buechel, Frederick F. Acetabular reamer. 5,462,548, Cl. 606-80.000.

Pappas, Thrasyvoulos N.: *See—*
Neuhoff, David L.; and Pappas, Thrasyvoulos N., 5,463,472, Cl. 358-298.000.

Paquer, Daniel: *See—*
Born, Maurice; Aberkane, Ourida; Mieloszynski, Jean-Luc; Paquer, Daniel; and Parc, Guy, 5,463,132, Cl. 568-22.000.

Paradowski, Henri, to Compagnie Francaise d' et de Construction-Technique. Self-refrigerated method of cryogenic fractionation and purification of gas and heat exchanger for carrying out the method. 5,461,870, Cl. 62-11.000.

Parc, Guy: *See—*
Born, Maurice; Aberkane, Ourida; Mieloszynski, Jean-Luc; Paquer, Daniel; and Parc, Guy, 5,463,132, Cl. 568-22.000.

Parekh, Shyamal I.: *See—*
Barton, Derek H. R.; Parekh, Shyamal I.; Taylor, Dennis K.; and Tse, Chi-lam, 5,463,089, Cl. 549-458.000.

Paris, Jean; and Chemello, Jean-Pierre, to Salomon S.A. Ski boot with adjustable slant of the upper. 5,461,802, Cl. 36-121.000.

Park, Kyeong B.: *See—*
Kim, Jung C.; Oh, Dong Y.; Choe, Gyu S.; Hong, Kyung S.; Kim, Kyung H.; Lee, Joo H.; Lee, Ha I.; Park, Kyeong B.; Gil, Dong S.; Kwon, Oh H.; and Kwon, Byoung H., 5,461,886, Cl. 68-3.0SS.

Park, Melvin A.: *See—*
Young, David T.; Marshall, Jill A.; Schweikert, Emile A.; and Park, Melvin A., 5,463,220, Cl. 250-288.000.

Parker, Paul R.: *See—*
Zumberge, Mark A.; Canuteson, Eric L.; and Parker, Paul R., 5,461,914, Cl. 73-382.00R.

Parkhurst, Carmenina. Lodging facility automated processing station. 5,463,546, Cl. 364-407.000.

Parkinson, Alvin O.: *See—*
Morduch, Georg E.; Parkinson, Alvin O.; and Urso, Thomas S., Jr., 5,463,684, Cl. 379-202.000.

Parks, Terry J.: *See—*
Gaskins, Darius D.; and Parks, Terry J., 5,463,643, Cl. 371-40.100.

Pasad, Dilip; and Garcia, Frank, to Levi Strauss & Co. Mist treatment of garments. 5,461,742, Cl. 8-149.200.

Pascoe, James R.: *See—*
Kuhlmann, Erven J.; Pascoe, James R.; and Thom, Christopher J., 5,463,160, Cl. 585-671.000.

Pascucci, Gregory A.; Rasmussen, David E.; Decious, Gaylon M.; Garbe, James R.; Hyzer, Susan M.; Woest, Karen L.; Vairavan, Vairavan; Koch, David L.; Gottschalk, Donald A., Jr.; Burkhardt, Dennis E.; Standish, Darrell E.; Madaus, Paul W.; Spacek, Dan J.;. Method of downloading information stored in an arching device to destination network controller through intermediate network controllers in accordance with routing information. 5,463,735, Cl. 395-200.100.

Passavant-Werke AG: *See—*
Fresenius, Jürgen; and Gebhardt, Fritz, 5,462,663, Cl. 210-230.000.

Pataj, Bruno: *See—*
Wendt, Heinz; and Pataj, Bruno, 5,462,002, Cl. 114-260.000.

Patch, James R.: *See—*
Lindsey, Joe P.; and Patch, James R., 5,463,594, Cl. 367-38.000.

Patel, Mahendra S.: *See—*
Sudhakar, Chakka; Dolfinger, Frank, Jr.; Cesar, Max R.; Patel, Mahendra S.; and Fritz, Paul O., 5,462,651, Cl. 208-143.000.

Patel, Snehal: *See—*
Blackbourn, Robert L.; Allan, Edgar D.; Le, Loc B.; and Patel, Snehal, 5,463,136, Cl. 568-385.000.

Patel, Suresh R.: *See—*
Wiedner, Guenther; Duncan, John A.; and Patel, Suresh R., 5,461,724, Cl. 2-2.000.

Patel, Vishnubhai V.: *See—*
Grill, Alfred; and Patel, Vishnubhai V., 5,462,784, Cl. 428-65.500.

Patil, Abhimanyu O.: *See—*
Brois, Stanley J.; Patil, Abhimanyu O.; Schulz, Wolfgang W.; Hsu, Chang S.; and Garner, Richard T., 5,462,680, Cl. 252-9.000.

Paton, Anthony D.; and Kruse, Jurgen M., to XAAR Limited. Reduced nozzle viscous impedance. 5,463,416, Cl. 347-100.000.

Patrick, Edward P.; and Pajerski, A. Victor, to Aluminum Company of America. Electric arc method for treating the surface of lithoplate and other metals. 5,462,609, Cl. 148-241.000.

Patwong Technologies, Inc.: *See—*
Wong, Mag K.; and Wong, Patrick T. T., 5,463,223, Cl. 250-339.120.

Patzelt, Norbert; Blasczyk, Gotthard; and Eickholt, Hubert, to Krupp Polysius AG. Grinding plant and method of grinding and classifying brittle material for grinding. 5,462,234, Cl. 241-19.000.

Patzke, Ottokar: *See—*

- Prause, Reinhard; Patzke, Ottokar; Pawelletz, Reinhard; and Harbach, Bernhard, 5,461,920, Cl. 73-622.000.

Paul Wurth S.A.: *See—*
- Benck, Jean; and Mailliet, Pierre, 5,462,433, Cl. 432-99.000.
- Lonardi, Emile; Andonov, Radomir; and Cimenti, Giovanni, 5,462,260, Cl. 266-226.000.

Pavey, Steven J.: *See—*
- Meisenburg, Gary L.; Eick, Edward C.; Magee, Phillip D.; Mixon, Charles M.; Weronke, Robert B.; Shields, Waylon D.; Smith, Woody R.; and Pavey, Steven J., 5,462,463, Cl. 440-80.000.

Paw Paw Farmer's Factory Co.: *See—*
- Winterton, Dean A., 5,461,995, Cl. 111-139.000.

Pawelletz, Reinhard: *See—*
- Prause, Reinhard; Patzke, Ottokar; Pawelletz, Reinhard; and Harbach, Bernhard, 5,461,920, Cl. 73-622.000.

Payne, Scott T.; Wize, Gary A.; and Carl, James E., to General Motors Corporation. High strength vehicle recliner seat. 5,462,332, Cl. 297-216.100.

Pearce, Richard A.: *See—*
- Scofield, Robert L.; and Pearce, Richard A., 5,462,412, Cl. 416-210.00R.

Pearson, Chris C.: *See—*
- Bakholdin, Daniel; Bosley, Robert W.; and Pearson, Chris C., 5,462,402, Cl. 415-90.000.

Pearson, Stephen, to Theraposture Limited. Multi-positional bed. 5,461,740, Cl. 5-611.000.

Pedercini, Maurizio: *See—*
- Zacche', Vanni; Orlandi, Ireneo; and Pedercini, Maurizio, 5,462,632, Cl. 156-566.000.

Pedersen, Michael J.; Sampath, Vijay R.; and Litchfield, James F., to Atlantic Richfield Company. Method and apparatus for mixing and distributing fluids in a reactor. 5,462,719, Cl. 422-195.000.

Pederson, Glen E.: *See—*
- Gillig, Steven F.; and Pederson, Glen E., 5,463,674, Cl. 379-59.000.

Peek, Gregory A.; Lytle, William B.; and Dyer, John A., to LaBac Systems, Inc. Detent. 5,462,380, Cl. 403-329.000.

Peetz, Wolfgang, to Hawera Probst GmbH. Drilling tool. 5,462,130, Cl. 175-323.000.

Pegg, Timothy J.; Hjipieris, George; and Bullock, Andrew G., to Marconi Instruments Limited. Instrument for measuring the frequency and power of a microwave signal. 5,463,310, Cl. 324-95.000.

Pelosi, Stanford S., Jr.: *See—*
- Yu, Chia-Nien; Pelosi, Stanford S., Jr.; and Calcagno, Mark A., 5,462,940, Cl. 514-235.800.

Peltonen, Kari: *See—*
- Niskanen, Toivo; and Peltonen, Kari, 5,462,585, Cl. 95-261.000.

Pemberton, Denis: *See—*
- McTaggart, Fergus; Pemberton, Denis; and Smith, Graham J., 5,462,730, Cl. 424-78.350.

Penisson, Dennis J., to Bilco Tools, Inc. Method and apparatus for testing oilfield tubular threaded connections. 5,461,905, Cl. 73-46.000.

Pentalpha Enterprises Ltd.: *See—*
- Sham, John C. K.; and Leung, Fan Kai, 5,463,205, Cl. 219-502.000.

Penzel, Erich; Franzmann, Gernot; Angel, Maximilian; Pakusch, Joachim; and Schuler, Bernhard, to BASF Aktiengesellschaft. Use of unsaturated sulfonic acid polymers as spray drying assistants. 5,462,978, Cl. 523-342.000.

Pepsico, Inc.: *See—*
- Valyi, Emery I., 5,462,278, Cl. 273-138.00R.

Perdieus, Pieter: *See—*
- Jansen, Benedictus; Roefs, André; Sels, Francis; Perdieus, Pieter; and Florens, Raymond, 5,462,831, Cl. 430-139.000.

Perets, Ronen: *See—*
- Wertheizer, Gideon; Be'ery Yair; Ovadia, Bat-Sheva; Gross, Yael; Perets, Ronen; and Milstein, Yakov, 5,463,749, Cl. 395-437.000.

Perez-Bernal, Elena M.: *See—*
- Pinnavaia, Thomas J.; Perez-Bernal, Elena M.; Ruamo-Casero, Ricardo; and Chibwe, Malama, 5,463,042, Cl. 540-139.000.

Perfection Spring & Stamping Corp.: *See—*
- Seyler, Peter G., 5,462,335, Cl. 297-284.400.

Perkins, Raymond C., Jr. Image support apparatus. 5,461,804, Cl. 40-152.100.

Perkins, Thomas K., to Atlantic Richfield Company. Waste disposal in subterranean earth formations. 5,463,164, Cl. 588-250.000.

Perlman, Daniel, to Brandeis University. Temporary liquid storage cavities in a centrifuge tube. 5,462,881, Cl. 436-180.000.

Permar, Clark. Liquid treatment apparatus for providing a flow of pressurized liquid. 5,462,414, Cl. 417-313.000.

Peroxid-Chemie GmbH: *See—*
- Roesler, Richard; Schelle, Siegfried; Gnann, Michael; and Zeiss, Werner, 5,462,692, Cl. 252-186.260.

Perregaard, Jens K.; and Costall, Brenda, to H. Lundbeck A/S. Treatment of addiction to drugs and substances of abuse. 5,462,948, Cl. 514-323.000.

Perrero, Thomas, Jr. Socket type tool for removing oil filter cartridge. 5,461,948, Cl. 81-128.000.

Persson, Mats. Method and device for controlling a flow of fluid. 5,462,075, Cl. 137-2.000.

Perusek, Robert V.; Koch, Ulrich H.; and Kalata, Gregory S., to Nupro Company. Excess flow valve. 5,462,081, Cl. 137-498.000.

Pete, Derrick D.: *See—*
- Hendriksen, Dan E.; McGlamery, Gerald G.; Keenan, Michael J.; and Pete, Derrick D., 5,463,157, Cl. 585-511.000.

Petersen, Bernard L.; Ledford, Alan M.; and Kruse, Gary L., to Oliver Products Company. Variable thickness bread slicer. 5,461,956, Cl. 83-221.000.

Petersen, Corey D.; Hiser, Douglas L.; and Kardontchik, Jaime E., to IMP, Inc. Programmable operation transconductance amplifier. 5,463,349, Cl. 330-254.000.

Petersen, Corey D., to IMP, Inc. Computer disk drive integrated data path circuit optimized for handling both data and servo signals. 5,463,603, Cl. 369-48.000.

Peterwerth, Bernhard: *See—*
- Kastingschafer, Gerhard; Auf dem Venne, Johannes; Pingel, Herbert; Giesemann, Reinhard; Peterwerth, Bernhard; Gerhardt, Klaus; and Gebbe, Reinhold, 5,462,370, Cl. 384-549.000.

Petitpierre, Eric M.; and Holmes, John E., to Hubbell Incorporated. Electrical circuit card with EMI shielding strip adapted to make contact with non-outwardly facing surface of card-receiving housing. 5,463,532, Cl. 361-800.000.

Petroleo Brasileiro S.A.-Petrobras: *See—*
- de Souza, Walber P.; and Moreira, José R. F., 5,462,119, Cl. 166-348.000.

Pews, Richard G.: *See—*
- Lysenko, Zenon; and Pews, Richard G., 5,463,129, Cl. 564-423.000.

Peyronel, Jean-Francois: *See—*
- Achard, Daniel; Grisoni, Serge; Malleron, Jean-Luc; Peyronel, Jean-Francois; and Tabart, Michel, 5,463,077, Cl. 548-515.000.

Pfeiffer, Robert W. Processes using fluidized solids and apparatus for carrying out such processes. 5,462,717, Cl. 422-146.000.

Pfizer Inc.: *See—*
- Goldstein, Steven W.; and McDermott, Ruth E., 5,463,070, Cl. 548-236.000.
- Williams, Michael T., 5,463,126, Cl. 564-222.000.

Pfleuger, D. Russell. Chemical composition for lipstick sealant. 5,462,737, Cl. 424-401.000.

Pfrengle, Waldemar F. A., to Shell Research Limited. Fungicidal composition and method of combating fungi. 5,462,944, Cl. 514-275.000.

Pharmacia AB: *See—*
- Bogentoft, Conny; Carlsson, Anders; and Tomlin, Janet, 5,462,742, Cl. 424-439.000.

Pharmacia Aktiebolag: *See—*
- Kihlberg, Reinhold; Lindgren, Svante B.; and Sandberg, Lars G., 5,462,924, Cl. 574-12.000.

Philips Electronics North America Corporation: *See—*
- Bailey, Richard A.; and Midavaine, John C., 5,462,468, Cl. 445-59.000.
- Divincenzo, Gregory T.; and Gabrielson, Stefan, 5,463,199, Cl. 218-158.000.

Phillips, James P.: *See—*
- Vannatta, Louis J.; and Phillips, James P., 5,463,406, Cl. 343-725.000.

Phillips Petroleum Company: *See—*
- Callejas, Ricardo J.; and Greenwood, Gil J., 5,463,159, Cl. 585-648.000.
- Eastman, Alan D., 5,463,162, Cl. 585-724.000.
- Lin, Fan-Nan, 5,463,166, Cl. 585-748.000.

Piaggio Veicoli Europei S.p.A.: *See—*
- Nuti, Marco, 5,462,024, Cl. 123-179.140.

Pick, John H.; and Logan, Robert T., to Akzo N.V. 4-aryl-imidazole derivatives. 5,462,959, Cl. 514-400.000.

Pickens, Joseph R.: *See—*
- Langan, Timothy J.; Pickens, Joseph R.; Heubaum, Frank H.; and Kramer, Lawrence S., 5,462,712, Cl. 420-528.000.

Picker, Franck: *See—*
- Carroll, Lewis; Hendry, George; and Picker, Franck, 5,463,291, Cl. 315-502.000.

Pidhirny, John M.: *See—*
- Longacre, Andrew, Jr.; Hussey, Robert M.; and Pidhirny, John M., 5,463,214, Cl. 235-472.000.

Pieper, Helmut: *See—*
- Himmelsbach, Frank; Linz, Guenter; Austel, Volkhard; Pieper, Helmut; Mueller, Thomas; Weisenberger, Johannes; and Seewaldt-Becker, Elke, 5,463,071, Cl. 548-251.000.

Pierce, Thomas W. Resealable, refillable container system. 5,462,189, Cl. 220-254.000.

Pierce, Timothy P.: *See—*
- Hopkins, Scott D.; and Pierce, Timothy P., 5,462,675, Cl. 210-767.000.

Piers, George E., to Triton Engineering Services Company. Cleaning system for vibratory screening devices. 5,462,673, Cl. 210-739.000.

Pies, John R., to Compaq Computer Corporation. Apparatus for film coated passivation of ink channels in ink jet printhead. 5,462,600, Cl. 118-503.000.

Pietras, Mark A.: *See—*
- Kantner, Robert F., Jr.; Iverson, Vaughn S.; Morse, Kenneth; Pietras, Mark A.; and Rodriguez, Arturo A., 5,463,701, Cl. 382-166.000.

Piety, Richard W., to Computational Systems, Inc. Apparatus and method for rotationally positioning a rotor. 5,461,791, Cl. 33-1.00N.

Pimbley, Joseph M.: *See—*
- Kwasnick, Robert F.; and Pimbley, Joseph M., 5,463,322, Cl. 324-522.000.

Pinchon, Didier: *See—*
- Desrosiers, Bernard; Louis, Didier; Pinchon, Didier; and Steimle, Andre, 5,463,574, Cl. 364-748.000.

Ping, Wu K. Automatic cleaning device for use on a stock farm. 5,462,227, Cl. 239-227.000.

Pingel, Herbert: *See—*

  Kastingschafer, Gerhard; Auf dem Venne, Johannes; Pingel, Herbert; Giesemann, Reinhard; Peterwerth, Bernhard; Gerhardt, Klaus; and Gebbe, Reinhold, 5,462,370, Cl. 384-549.000.
Pinkos, Rolf; and Fischer, Rolf, to BASF Aktiengesellschaft. Preparation of five-membered nitrogen heterocycles. 5,463,079, Cl. 548-543.000.
Pinnavaia, Thomas J.; Perez-Bernal, Elena M.; Ruarno-Casero, Ricardo; and Chibwe, Malama, to Board of Trustees operating Michigan State University. Polyaryl-metallic complex intercalated layered double hydroxides. 5,463,042, Cl. 540-139.000.
Pinschmidt, Robert K., Jr.; Dixon, Dale D.; Burgoyne, William F., Jr.; and Goldstein, Joel E., to Air Products and Chemicals, Inc. Polymers of self- and diol reactive formaldehyde-free crosslinking monomers. 5,463,007, Cl. 526-266.000.
Pinschmidt, Robert K., Jr.: *See—*
  Chen, Ning; Renz, Walter L.; and Pinschmidt, Robert K., Jr., 5,463,110, Cl. 560-172.000.
Pioneer Electronic Corporation: *See—*
  Araki, Morio; Hayashi, Katsuyoshi; and Habu, Yukiko, 5,463,553, Cl. 364-444.000.
  Araki, Morio; Hayashi, Katsuyoshi; and Habu, Yukiko, 5,463,554, Cl. 364-444.000.
  Higuchi, Takanobu, 5,463,608, Cl. 369-109.000.
  Hiroshima, Yasunori; and Kondo, Kenji, 5,462,512, Cl. 483-57.000.
  Naito, Ryuichi, 5,463,604, Cl. 369-50.000.
  Nishida, Junichi; Araki, Morio; Arakawa, Takeharu; Ishida, Tessho; Ayukai, Yasushiro; Baba, Toshiharu; Sakaguchi, Masahiko; Nobe, Kenichi; Kaneko, Michihiro; and Shinohara, Jun, 5,463,605, Cl. 369-58.000.
Pioneer Hi-Bred International, Inc.: *See—*
  Hoffbeck, Loren J., 5,463,173, Cl. 800-200.000.
Pipe Rehab International, Inc.: *See—*
  McMillan, James S.; and Tarsha, Simon, 5,462,706, Cl. 264-138.000.
Pirc, Douglas J., to Warner-Lambert Company. Dynamic shaving system with integral push clean bar and spring member. 5,461,781, Cl. 30-41.000.
Pischke, Robert D.: *See—*
  Lindemann, David C.; Chiang, Weilong L.; Luetkens, Melvin L., Jr.; Pischke, Robert D.; and Schubert, John C., 5,462,794, Cl. 428-317.100.
Pittard, Gerard T.: *See—*
  Cohen, John H.; Leitko, Curtis E.; Pittard, Gerard T.; Clifton, Terry P.; and Rockower, Gerald, 5,462,077, Cl. 137-15.000.
Pitts, John, to Envirowaste Systems, Inc. Process and system for treating solid and liquid waste. 5,462,676, Cl. 210-774.000.
Piwinski, John J.: *See—*
  Shih, Neng-Yang; Aslanian, Robert; Lupo, Andrew, Jr.; Piwinski, John J.; Green, Michael J.; and Ganguly, Ashit K., 5,463,074, Cl. 548-314.700.
Planar Systems, Inc.: *See—*
  Khormaei, Iranpour, 5,463,279, Cl. 315-169.300.
Plastics, Inc.: *See—*
  Pomroy, James F.; and Traxler, Eva M., 5,462,192, Cl. 220-526.000.
Plaut, Andrew G.: *See—*
  Bachovchin, William W.; Plaut, Andrew G.; and Flentke George R., 5,462,928, Cl. 514-19.000.
Plavidal, Richard W.; Nitescu, Petru N.; Mudwilder, Greg; and Crockett, Richard, to Applied Materials, Inc. Heated removable throttle valve. 5,462,080, Cl. 137-337.000.
Plessey Semiconductors Limited: *See—*
  Gilbert, David P., 5,463,409, Cl. 345-167.000.
  Hastie, Neil S., 5,463,327, Cl. 326-37.000.
  Hobden, Mervyn K., 5,463,357, Cl. 332-151.000.
Plichta, Edward J.; and Behl, Wishvender K., to United States of America, Army. High temperature sodium-graphite electrochemical cell. 5,462,818, Cl. 429-104.000.
Plicon Corporation: *See—*
  Raines, Charles D.; and Hoffman, Kenneth C., 5,462,756, Cl. 426-129.000.
Plum Enterprises, Inc.: *See—*
  Carrington, Janice D., 5,461,730, Cl. 2-411.000.
Plumb, William L.: *See—*
  Roth, Richard; Miller, Paul D.; and Plumb, William L., 5,462,159, Cl. 206-310.000.
Podszun, Wolfgang; Bloodworth, Robert; and Oppermann, Günter, to Bayer Aktiengesellschaft. Electroviscous fluid based on polyether acrylates as disperse phase. 5,462,687, Cl. 252-79.000.
Polacek, Manfred, to Wacker-Werke GmbH & Co. KG. Vibrator with incorporated electric motor. 5,462,388, Cl. 404-113.000.
Polinski, Russell E.; and Morrow, John K., to Russell Specialties Corporation. Sports card tray and storage organizer device. 5,462,167, Cl. 206-455.000.
Polivka, Alan L.; and Zahm, Charles, to Harris Corporation. System for conducting video communications over satellite communication link with aircraft having physically compact, effectively conformal, phased array antenna. 5,463,656, Cl. 375-200.000.
Polley, Richard B.: *See—*
  Jones, William C., Jr.; Polley, Richard B.; and Sanzo, Roger F., 5,462,139, Cl. 188-206.00R.
Pollock, Eugene B.; and Knollenberg, Jeffrey L., to Grain Systems, Inc. Poultry feeder. 5,462,017, Cl. 119-57.400.
Pomroy, James F.; and Traxler, Eva M., to Plastics, Inc. Lunch holder. 5,462,192, Cl. 220-526.000.
Pontes, Fatima M.: *See—*
  Moffat, Karen A.; Pontes, Fatima M.; Paine, Anthony J.; McAneney, Brian; and Puri, Paul, 5,462,828, Cl. 430-106.000.
Ponti, Roberto: *See—*
  Bastioli, Catia; Bellotti, Vittorio; Del Tredici, Gianfranco; Montino, Alessandro; and Ponti, Roberto, 5,462,980, Cl. 524-47.000.
  Bastioli, Catia; Bellotti, Vittorio; Del Tredici, Gianfranco; and Ponti, Roberto, 5,462,981, Cl. 524-47.000.
Poppe, George; Ciesielski, Denise; and Matlock, Mark, to Archer Daniels Midland Company. Method of producing protein products for bright paper coating applications. 5,462,593, Cl. 106-124.000.
Popperling, Rolf: *See—*
  Von Hagen, Ingo; Popperling, Rolf; Schlerkmann, Hubertus; and Zeislmair, Ulrike, 5,462,615, Cl. 148-592.000.
Portelli, Gene B.; Schultz, William J.; Boden, John T.; and Kaufer, Daniel M., to Minnesota Mining and Manufacturing Company. Thermoplastic polymer particles in liquid thermosettable resin. 5,462,996, Cl. 525-423.000.
Porter Athletic Equipment Company: *See—*
  Schroeder, Edward A.; and Gallicchio, James, 5,462,269, Cl. 273-15.00R.
Portman, Jill. Brewing pot. 5,461,968, Cl. 99-287.000.
Portofee, Donald C.: *See—*
  Gaito, Andre A.; and Portofee, Donald C., 5,462,281, Cl. 273-238.000.
Possanza, William A.: *See—*
  Chiu, Tzu-Yin; Erceg, Frank M.; Krafty, Francis A.; Liu, Te-Yin M.; Possanza, William A.; and Sung, Janmye, 5,462,888, Cl. 437-57.000.
Potucek, Martin: *See—*
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Pouet, Claude; and Collumeau, Yoland, to SGS-Thomson Microelectronics, S.A. Device for assembling semiconductor chips between two heat sinks. 5,462,219, Cl. 228-49.500.
Pound, John D. Towelette dispensing device for cleaning a toilet seat. 5,462,197, Cl. 221-46.000.
Pounds, Russell; and Cherry, Doyle, to Crescent Holdings Limited. Hydrogen sulfide scavenging process. 5,462,721, Cl. 423-226.000.
Poux, Jacques; Gandia, Liberto; and Rouget, Frédéric, to Societe Anonyme Dite: European Gas Turbines SA. Gas turbine exhaust diffuser. 5,462,088, Cl. 138-39.000.
Powell, Anthony L.: *See—*
  Butters, Brian E.; and Powell, Anthony L., 5,462,674, Cl. 210-748.000.
Powell, Joseph B.; Slaugh, Lynn H.; Forschner, Thomas C.; Thomason, Terry B.; Semple, Thomas C.; Weider, Paul R.; and Arhancet, Juan P., to Shell Oil Company. Process for preparing 1,3-propanediol. 5,463,144, Cl. 568-867.000.
Powell, Joseph B.; Slaugh, Lynn H.; Forschner, Thomas C.; Semple, Thomas C.; and Weider, Paul R., to Shell Oil Company. Process for preparing 1,3-propanediol. 5,463,145, Cl. 568-867.000.
Powell, Joseph B.: *See—*
  Slaugh, Lynn H.; Powell, Joseph B.; Forschner, Thomas C.; Semple, Thomas C.; and Weider, Paul R., 5,463,146, Cl. 568-862.000.
Powell, Saul R.; and Tortolani, Anthony J., to Research Corporation Technologies. Methods for improving recovery of heart function from open heart surgery. 5,462,524, Cl. 604-52.000.
Power-Fardy, Stephen N. Self-contained display device for headwear. 5,462,471, Cl. 446-26.000.
Powers, William J. Ectoparasite remover and method for removing an ectoparasite from a host organism. 5,462,556, Cl. 606-131.000.
Pozniakas, Robert S.; and Minagawa, Gary A., to Xerox Corporation. Method and apparatus for adaptive cleaner blade lubrication. 5,463,455, Cl. 355-299.000.
Pozzobon, Alessandro, to Nordica S.p.A. Braking device particularly for skates. 5,462,296, Cl. 280-11.200.
PPG Industries, Inc.: *See—*
  Wilt, Truman F.; Hayes, Deborah E.; Krepley, Charles R.; and Rardon, Daniel E., 5,462,992, Cl. 525-176.000.
Prasad, Arun; and Schulman, Martin, to Jeneric/Pentron Incorporated. Dental alloys for composite and porcelain overlays. 5,462,437, Cl. 433-207.000.
Prause, Reinhard; Patzke, Ottokar; Pawelletz, Reinhard; and Harbach, Bernhard, to Krautkramer GmbH & Co. Whole-body test system with a test probe mount designed especially as a rotor which is mounted on a vertically adjustable support platform and has a test-piece manipulator. 5,461,920, Cl. 73-622.000.
Praxair Technology, Inc.: *See—*
  Pritchard, Francis E.; Koederitz, Eugene H.; Fuhrhop, Ronald E.; and Barker, Thomas H., Jr., 5,462,429, Cl. 431-3.000.
Prescott, Alain. Watertight raising band for manhole. 5,462,386, Cl. 404-26.000.
Prescott, Leslie K. Bookmark. 5,462,007, Cl. 116-239.000.
Pressler, Wilfried: *See—*
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Price, Ferris T., deceased (by Robert H. Price, legal representative): *See—*
  Rodi, EuGene A.; Price, Ferris T., deceased, 5,463,644, Cl. 371-40.400.
Price, Robert H., legal representative: *See—*
  Rodi, EuGene A.; Price, Ferris T., deceased, 5,463,644, Cl. 371-40.400.
Price, Robert T., to International Business Machines Corporation. Method and apparatus for graphic accessing of multiple software applications. 5,463,726, Cl. 395-155.000.

- Primax Electronics Ltd.: *See—*
  - Wang, Oliver; and Hou, Ben, 5,463,256, Cl. 271-274.000.
- Prisby, Michael V.: *See—*
  - Small, Edith M.; Prisby, Michael V.; and Thomason, Terry D., 5,462,622, Cl. 156-245.000.
- Pritchard, Francis E.; Koederitz, Eugene H.; Fuhrhop, Ronald E.; and Barker, Thomas H., Jr., to Praxair Technology, Inc. Mechanical wiper for waste gas incinerator. 5,462,429, Cl. 431-3.000.
- Pritt Produktionsgesellschaft mbH: *See—*
  - Manusch, Cristoph; Obersteller, Udo; and Klaassen, Willem, 5,462,633, Cl. 156-577.000.
- Procter & Gamble Company, The: *See—*
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  - Minton, Gerald T.; Horwich, Lisa J.; and Gilbert, Steven R., 5,462,166, Cl. 206-440.000.
  - Stahley, Robert E.; Lund, Mark T.; and Collias, Dimitris I., 5,462,208, Cl. 222-207.000.
- Protex Fasteners Limited: *See—*
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- Prototype Systems, Inc.: *See—*
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- Prouty, Catherine P.: *See—*
  - Dolle, Roland E.; Graybill, Todd L.; Speier, Gary J.; Prouty, Catherine P.; and Schmidt, Stanley J., 5,462,939, Cl. 514-231.500.
- Provost, James: *See—*
  - Hinkle, Luke D.; and Provost, James, 5,461,913, Cl. 73-204.250.
- PRP, Inc.: *See—*
  - Chao, Francis C., deceased; Chao, Michael S., heir; Chao, Mark S., heir; and Chao, Lorraine S., heir, 5,462,752, Cl. 424-532.000.
- Public Transportation Safety Devices Corp.: *See—*
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- Puckett, Paul M.: *See—*
  - Earls, Jimmy D.; Hefner, Robert E., Jr.; and Puckett, Paul M., 5,463,091, Cl. 549-560.000.
- Puckett, Sherrill A.: *See—*
  - Kuromoto, Traci Y.; Bell, Eric L.; McDugle, Woodrow G.; Eachus, Raymond S.; Puckett, Sherrill A.; Olm, Myra T.; and Wilson, Robert D., 5,462,849, Cl. 430-567.000.
- Punola, David C.; Basta, William C.; and Smith, Jeffery S., to Howmet Corporation. CVD apparatus and method for forming uniform coatings. 5,462,013, Cl. 118-719.000.
- Purcell, R. Andrew: *See—*
  - Thompson, Bruce A.; Van Maren, David J.; McCarthy, John G.; Purcell, R. Andrew; and Rottinghaus, Michael, 5,463,772, Cl. 395-600.000.
- Purcell, Robert J., to Caterpillar Inc. Resilient wheels with reinforcing rings. 5,462,345, Cl. 305-56.000.
- Purcocks, Dale M. Making reinforced tabbed or indexed sheets. 5,462,625, Cl. 156-264.000.
- Puri, Jeewan, to Square D Company. Method of manufacturing a strip wound coil to reinforce edge layer insulation. 5,461,772, Cl. 29-605.000.
- Puri, Paul: *See—*
  - Moffat, Karen A.; Pontes, Fatima M.; Paine, Anthony J.; McAneney, Brian; and Puri, Paul, 5,462,828, Cl. 430-106.000.
- Purific Environmental Technologies, Inc.: *See—*
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- Putsch, Ralf, to KNIPEX-Werk C. Gustav Putsch. Pliers with two plier arms. 5,461,951, Cl. 81-412.000.
- Qian, Jianzhong: *See—*
  - Hawman, Peggy C.; Qian, Jianzhong; and Treffert, Jon D., 5,462,056, Cl. 128-659.000.
- Quackenbush, Schuyler R.: *See—*
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- Queens Group, Inc.: *See—*
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- Quest International B.V.: *See—*
  - Barton, Derek H. R.; Parekh, Shyamal I.; Taylor, Dennis K.; and Tse, Chi-lam, 5,463,089, Cl. 549-458.000.
- Quick, Randall A. Removable steam table pan puller. 5,462,327, Cl. 294-27.100.
- Quillet, Thierry: *See—*
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- Quinn, Thomas M.: *See—*
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- Quintana, Jason M.: *See—*
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- Rabai, Jozsef: *See—*
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- Radcliffe, Clifford B.: *See—*
  - Dygert, Douglas M.; and Radcliffe, Clifford B., 5,462,169, Cl. 206-521.000.
- Radebaugh, Galen W.; Julian, Thomas N.; and Glinecke, Robert, to McNeil-PPC, Inc. Pharmaceutical sustained release matrix. 5,462,747, Cl. 424-465.000.
- Rademacher, Roger J.: *See—*
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- Radke, Sharon: *See—*
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- Rafferty, Michael F.: *See—*
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- Ragan, Lawrence H.: *See—*
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- Rahardja, Budianto, to P.T. Djarum, Bagian Produski Cerutu, Per Wakilan. Method and apparatus for making a filter cigar product. 5,462,070, Cl. 131-76.000.
- Rai, Habib G.: *See—*
  - Rogers, Charles W.; Crane, David A.; and Rai, Habib G., 5,462,618, Cl. 156-161.000.
- Raines, Charles D.; and Hoffman, Kenneth C., to Plicon Corporation. Cook-in meat package. 5,462,756, Cl. 426-129.000.
- Rainey, Michael J.: *See—*
  - Holland, Malcolm J.; and Rainey, Michael J., 5,463,598, Cl. 367-131.000.
- Raj, Kuldip; and Moskowitz, Ronald, to Ferrofluidics Corporation. Ferrofluid-cooled electromagnetic device and improved cooling method. 5,462,685, Cl. 252-62.560.
- Rajan, Heidi A.: *See—*
  - Nealon, William J.; and Rajan, Heidi A., 5,463,659, Cl. 375-202.000.
- Raje, Prasad A., to Hewlett-Packard Company. Output drivers in high frequency circuits. 5,463,326, Cl. 326-30.000.
- Ramachandran, Ramakrishnan; and Dao, Loc H., to BOC Group, Inc., The. Process for the production of oxo products. 5,463,137, Cl. 568-454.000.
- Ramos, Gerardo: *See—*
  - Schneider, Peter; Ramos, Gerardo; and Bersier, Jacques, 5,463,047, Cl. 540-362.000.
- Ramp, Benjamin E.: *See—*
  - Truckenbrod, Thomas G.; and Ramp, Benjamin E., 5,462,174, Cl. 209-394.000.
- Rampal, Jang B.: *See—*
  - Coassin, Peter J.; Konrad, Kenneth D.; Rampal, Jang B.; and Cook, Ronald M., 5,462,854, Cl. 435-6.000.
- Randall, Richard D.; and Bucher, Alan W., to ITT Corporation. Temperature-responsive, locking mechanism for, and in combination with, a fluid valve. 5,462,226, Cl. 236-93.00R.
- Ransom, Keith C.; and Southwell, Michael J., to Ford Motor Company. Exhaust system. 5,463,194, Cl. 181-240.000.
- Rantanen, Rauno, to Valmet Paper Machinery Inc. Coating device for coating of a size-press roll, paper or board. 5,462,594, Cl. 118-249.000.
- Ranucci, Elisabetta: *See—*
  - Ferruti, Paolo; Ranucci, Elisabetta; and Bignotti, Fabio, 5,463,012, Cl. 528-196.000.
- Rao, Sathyanarayana: *See—*
  - Keller, Hansjoerg; Rao, Sathyanarayana; and Schuerch, Heinz-Christoph, 5,463,622, Cl. 370-60.100.
- Rao, V N. Mallikarjuna, to Du Pont de Nemours, E. I., and Company. Halofluorocarbon hydrogenolysis. 5,463,152, Cl. 570-176.000.
- Rapoport, Uri; and Panosh, Richard, to Advanced Techtronics, Inc. Permanent magnet arrangement. 5,462,054, Cl. 128-653.500.
- Raptor, Inc.: *See—*
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- Rardon, Daniel E.: *See—*
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- Rasmussen, Christine A.: *See—*
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- Rasmussen, David E.: *See—*
  - Pascucci, Gregory A.; Rasmussen, David E.; Decious, Gaylon M.; Garbe, James R.; Hyzer, Susan M.; Woest, Karen L.; Vairavan, Vairavan; Koch, David L.; Gottschalk, Donald A., Jr.; Burkhardt, Dennis E.; Standish, Darrell E.; Madaus, Paul W.; Spacek, Dan J.;, 5,463,735, Cl. 395-200.100.
- Rast, Hans G.: *See—*
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- Rational GmbH: *See—*
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- Rauch, Joseph A., to P.I.D. Rauch Industrial Design Ltd.; and Zeleznik, Haim. Shaving kit. 5,461,782, Cl. 30-47.000.
- Rauschenbach, Stefan: *See—*
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- Raven, Anthony, to Diomed Limited. High power light source. 5,463,534, Cl. 362-32.000.
- Rawson, Ray, to Unverferth Manufacturing Co., Inc. Dual coulter device. 5,462,124, Cl. 172-569.000.
- Raychem Corporation: *See—*
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- Raymond Corporation, The: *See—*
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- Raymond Engineering Inc.: *See—*
  - Meisterling, Jesse R., 5,461,923, Cl. 73-761.000.
- Rayovac Corporation: *See—*
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Razdan, Rahul, to Digital Equipment Corporation. High capacity netlist comparison. 5,463,561, Cl. 364-489.000.
Razeghi, Manijeh, to Northwestern University. Semiconductor films. 5,462,008, Cl. 117-2.000.
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Reboa, Paul F.: *See—*
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Redken Laboratories, Inc.: *See—*
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Reichle, Hans, to Reichle + De Massari AG. Multiple contact plug having encoding components interfittable in selected positions. 5,462,455, Cl. 439-681.000.
Reid, David R.; and Cuddy, James. Scent dispenser. 5,461,814, Cl. 43-1.000.
Reierson, Robert L., to Rhone-Poulenc Inc. Process of making low dioxane alkoxylate phosphate esters. 5,463,101, Cl. 558-110.000.
Reiman, Cassandra A. Toilet seat cover. 5,461,732, Cl. 41-245.300.
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Remy, Jean-Luc A. M.; Roch, Jean; and Volat, Jean-Pierre, to Bertin & Cie. Device for temporary storage of flat objects. 5,462,268, Cl. 271-225.000.
Rencher, William F., to McNell-PPC, Inc. Bioadhesive pharmaceutical carrier. 5,462,749, Cl. 424-484.000.
Reneau, Raymond P. Workstation with integrated computer. 5,461,974, Cl. 108-147.000.
Renkor, Edward J.: *See—*
Weller, Edward L., Jr.; Renkor, Edward J.; and Weller, Edward L., III, 5,462,834, Cl. 430-176.000.
Renn, Robert M.; and Volz, Keith L. Low profile electrical connector. 5,462,441, Cl. 439-67.000.
Rensselaer Polytechnic Institute: *See—*
Crivello, James V.; and Sasaki, Hiroshi, 5,463,084, Cl. 549-214.000.
Renz, Walter L.: *See—*
Chen, Ning; Renz, Walter L.; and Pinschmidt, Robert K., Jr., 5,463,110, Cl. 560-172.000.
Resasco, Daniel E.; Marcus, Bonita K.; Huang, Chen-Shi; and Durante, Vincent A., to Sun Company, Inc. (R&M). Process of making dehydrogenation catalysts by oxidizing and sulfiding catalytic metal on a nonacidic support. 5,462,904, Cl. 502-222.000.
Research Corporation Technologies: *See—*
Powell, Saul R.; and Tortolani, Anthony J., 5,462,524, Cl. 604-52.000.
Research Frontiers Incorporated: *See—*
Check, Joseph A., III, 5,463,491, Cl. 359-296.000.
Check, Joseph A., III, 5,463,492, Cl. 359-296.000.
Resistance Technology Inc.: *See—*
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Resto, Suzzette S.: *See—*
Mandel, Barry P.; Resto, Suzzette S.; Rizzolo, Charles D.; Green, Frederick A.; Van Dongen, Richard A.; and Billings, Phillip A., 5,462,265, Cl. 270-53.000.
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Rewitzer, Siegfried: *See—*
Miess, Georg-Emerich; Roth, Peter M.; Heinrich, Karl; and Rewitzer, Siegfried, 5,462,643, Cl. 203-72.000.
Rexroth Corporation, The: *See—*
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Reynolds, John J.: *See—*
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Reynolds, Ronald C.: *See—*
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Rheinmetall GmbH: *See—*
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RHH Foam Systems, Inc.: *See—*
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Rhinesmith, Robert, to Colgate-Palmolive Co. Liquid cleaning compositions. 5,462,690, Cl. 252-126.000.
Rhone-Poulenc Inc.: *See—*
Reierson, Robert L., 5,463,101, Cl. 558-110.000.
Rhone-Poulenc Nutrition Animale: *See—*
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Rhone-Poulenc Rhodia Aktiengesellschaft: *See—*
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Rhone-Poulenc Rorer S.A.: *See—*
Achard, Daniel; Grisoni, Serge; Malleron, Jean-Luc; Peyronel, Jean-Francois; and Tabart, Michel, 5,463,077, Cl. 548-515.000.
Ribadeau-Dumas, Guillaume: *See—*
Serpelloni, Michel; and Ribadeau-Dumas, Guillaume, 5,462,760, Cl. 426-572.000.
Ribar, Edward M.: *See—*
Lakes, A. Dale; Konkol, Patrick A.; and Ribar, Edward M., 5,462,909, Cl. 503-201.000.
Ribeiro, Faustino A. Stair stringer layout jig. 5,461,798, Cl. 33-562.000.
Rice, Bart F., to Lockheed Missiles & Space Company, Inc. Detection of a multi-sequence spread spectrum signal. 5,463,657, Cl. 375-200.000.
Richard Voss Grubenausbau GmbH: *See—*
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Richards, Mildred C., to Kendall Company, The. Pipe coating compositions. 5,462,780, Cl. 428-35.800.
Richardson, Donald G.: *See—*
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Richardson Technologies, Ltd.: *See—*
Cazort, J. Guy; and Richardson, Donald G., 5,462,140, Cl. 188-275.000.
Rickard, Dale A.: *See—*
Brodnax, Timothy B.; Bullis, Bryan K.; King, Steven A.; Kogge, Peter M.; and Rickard, Dale A., 5,463,746, Cl. 395-375.000.
Ricoh Company, Ltd.: *See—*
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Kurotori, Tsuneo; Echigo, Katsuhiro; Urakawa, Mitsuaki; Mizuno, Hisamitsu; and Hibi, Kunio, 5,463,447, Cl. 355-202.000.
Kurotori, Tsuneo; Mochizuki, Manabu; Ariyama, Kenzo; Kojima, Kenji; Tsuruoka, Ichiro; Echigo, Katsuhiro; Miyao, Mayumi; and Ikeda, Itsuo, 5,463,453, Cl. 355-256.000.
Murakami, Kakuji; and Nagai, Kiyofumi, 5,462,592, Cl. 106-22.00R.
Shimada, Tomoyuki; Sasaki, Masaomi; Hashimoto, Mitsuru; and Aruga, Tamotsu, 5,462,826, Cl. 430-59.000.
Ricottone, Jacqueline L. Disposable beaker sheath. 5,462,711, Cl. 422-1.000.
Ridgewell, Barry A.; and Fenton, Miles, to Vitron Systems Inc. Cyclodial propulsion system. 5,462,406, Cl. 416-111.000.
Riedel, Hans J.; and Schmerler, Michael, to Hagenuk Fahrzeugklima GmbH. Process and apparatus for regulating the supply of fresh air in high-speed trains. 5,462,481, Cl. 454-70.000.
Riedel, Karlheinz: *See—*
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Rieke, Reuben D., to University of Nebraska, Board of Regents of the. Preparation of doped polycarbynes. 5,463,018, Cl. 528-373.000.
Rieter Ingolstadt Spinnereimaschinenbau AG: *See—*
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Riggio, Salvatore R., Jr., to International Business Machines Incorporated. Amorphous, thin film transistor driver/receiver circuit with hysteresis. 5,463,339, Cl. 327-206.000.
Rijke, Arie M.; and Goitz, Henry T., to University of Virginia Patent Foundation. Wrist fixation device for elbow stress examination. 5,462,068, Cl. 128-881.000.
Riley, David A.; Chamberlin, Steven A.; and Bhatia, Ashok V., to Abbott Laboratories. Method for the preparation of D-chiro-inositol. 5,463,142, Cl. 568-833.000.
Rimai, Donald S.: *See—*
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Rivadeneira, Eric; and Jelich, Klaus, to Bayer Aktiengesellschaft. Process for the preparation of 2-amino-5-methyl-pyridine. 5,463,065, Cl. 546-304.000.

Rizk, Tony A.; and Hauser, Gary E., to Tennessee Valley Authority. Aeration system. 5,462,657, Cl. 210-170.000.

Rizzolo, Charles D.: *See—*

Mandel, Barry P.; Resto, Suzzette S.; Rizzolo, Charles D.; Green, Frederick A.; Van Dongen, Richard A.; and Billings, Phillip A., 5,462,265, Cl. 270-53.000.

RJJB & G, Inc.: *See—*

Kimmel, Ronald C., 5,462,666, Cl. 210-602.000.

Roba, Joseph L.; Gillet, Claude L.; Rafferty, Michael F.; Jarrott, Bevyn; and Beart, Philip M., to GD Searle & Co. Use of heterocyclic amino-alcohol compounds for treatment of CNS diseases. 5,462,965, Cl. 514-443.000.

Roberge, Richard D.: *See—*

Filion, Scott M.; Frost, Colin C.; Moore, Denis L.; Roberge, Richard D.; and Yedlin, Vincent J., 5,463,258, Cl. 307-10.100.

Robert Bosch GmbH: *See—*

Bullmer, Wolfgang; and Neuffer, Kurt, 5,462,499, Cl. 477-120.000.

Bullmer, Wolfgang; Kronenberg, Klemens; and Ott, Herbert, 5,462,501, Cl. 477-155.000.

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Hecht, Hans, 5,462,789, Cl. 428-209.000.

Jakob, Gert; and Schimitzek, Ralph, 5,462,344, Cl. 303-119.200.

Kugler, Karl-Heinz; Gollin, Walter; Riedel, Karlheinz; and Zimmermann, Christian, 5,462,036, Cl. 123-609.000.

Marek, Jiri; Schubert, Dietrich; Baumann, Helmut; Muenzel, Horst; Offenberg, Michael; and Willmann, Martin, 5,461,917, Cl. 73-514.160.

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Reichl, Asta; Jenner, Martin; Witzig, Armin; Rose, Anita; and Kuenzl, Bernd, 5,462,359, Cl. 374-148.000.

Roberts, Edward. Amusement device. 5,462,286, Cl. 273-459.000.

Robertson, Kimberly K.: *See—*

Hunt, Thomas J.; Herrick, Benjamin M.; Robertson, Kimberly K.; Thiele, Karl E.; and Ziel, J. Mark, 5,462,057, Cl. 128-661.010.

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Robinson, Kurt B.: *See—*

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Robotic Vision Systems, Inc.: *See—*

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Robotti, Karla M.; and Myerholtz, Carl A. Immobilization of pH-sensitive dyes to solid supports. 5,462,991, Cl. 525-54.300.

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Rocke, David J., to Caterpillar Inc. System and method for determining the completion of a digging portion of an excavation work cycle. 5,461,803, Cl. 37-443.000.

Rockower, Gerald: *See—*

Cohen, John H.; Leitko, Curtis E.; Pittard, Gerard T.; Clifton, Terry P.; and Rockower, Gerald, 5,462,077, Cl. 137-15.000.

Rockwell Body and Chassis Systems: *See—*

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Rockwell International Corporation: *See—*

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Lopez-Ramirez, Juan, 5,463,633, Cl. 371-20.300.

White, Stanley A., 5,463,575, Cl. 364-754.000.

Roden, Ralph V., Jr. Lock for inswinging doors. 5,462,319, Cl. 292-264.000.

Rodgers, Nicholas A. Fishing lure. 5,461,815, Cl. 43-17.600.

Rodhall, Arne; and Taylor, Donald E. Portable security system for outdoor sites. 5,463,595, Cl. 367-93.000.

Rodi, EuGene A.; Price, Ferris T., deceased (by Robert H. Price, legal representative), to Unisys Corporation. Resilient storage system. 5,463,644, Cl. 371-40.400.

Rodriguez, Arturo A.: *See—*

Kantner, Robert F., Jr.; Iverson, Vaughn S.; Morse, Kenneth; Pietras, Mark A.; and Rodriguez, Arturo A., 5,463,701, Cl. 382-166.000.

Rodriguez, Carmen L.; and Zajacek, John G., to Arco Chemical Technology, L.P. Integrated process for epoxide production. 5,463,090, Cl. 549-531.000.

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Jansen, Benedictus; Roefs, André; Sels, Francis; Perdieus, Pieter; and Florens, Raymond, 5,462,831, Cl. 430-139.000.

Roesler, Richard; Schelle, Siegfried; Gnann, Michael; and Zeiss, Werner, to Peroxid-Chemie GmbH. Stable solid acetylperoxyborate compounds. 5,462,692, Cl. 252-186.260.

Roewer, Norbert. Stomach tube. 5,462,528, Cl. 604-96.000.

Rogalla, Jan N., to Dayco Products, Inc. Belt tensioner and method of making the same. 5,462,494, Cl. 474-135.000.

Rogatschnig, Johann T.: *See—*

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Rogers Athletic Company: *See—*

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Rogers, Charles W.; Crane, David A.; and Rai, Habib G., to Bell Helicopter Textron Inc. Continuous process of making unidirectional graphite fiber reinforced pultruded rods having minimal fiber waviness. 5,462,618, Cl. 156-161.000.

Rohatgi, Ajeet: *See—*

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Rohm and Haas Company: *See—*

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Rohm Co., Ltd.: *See—*

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Nakata, Naotaro; Aoki, Naofumi; and Okada, Kenji, 5,463,707, Cl. 385-35.000.

Oki, Tetsuro; Harada, Koichiro; Neki, Ryuichi; Kawakami, Kazuo; Miyata, Tsuyoshi; and Matsuo, Kozo, 5,462,900, Cl. 437-249.000.

Shimoji, Noriyuki, 5,463,579, Cl. 365-185.010.

Rohr, Jürgen; Riegels, Martin; and Lohmann, Sylvia, to Bayer Aktiengesellschaft. Process for dyeing delustered polyamide fibers with acid dyestuffs and metal salts. 5,462,565, Cl. 8-531.000.

Rohr, Robert D.; Hess, John M.; Daniels, Richard J.; and Elliott, John, to AptarGroup, Inc. Closure with a tamper-evident element. 5,462,183, Cl. 215-237.000.

Rohr, Uwe: *See—*

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Roller Derby Skate Corporation: *See—*

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Romano, Charles E., Jr.; Edwards, Larry D.; and Hibbs, Richard E., to Eastman Kodak Company. Photographic element having a blue light sensitive layer containing a particular yellow dye-forming coupler and a magenta image dye-forming coupler. 5,462,842, Cl. 430-503.000.

Romano, Pame A. M. L. C. Creative game. 5,462,282, Cl. 273-240.000.

Romar Technologies, Inc.: *See—*

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Rönnholm, Karl S.: *See—*

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Rooney, Christopher F.: *See—*

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Roos, Jaap: *See—*

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Roosen, Raymond; Van Gorp, Herman; and Monbaliu, Marcel, to AGFA-GEVAERT N. V. Photographic print material suited for the production of a multicolor liquid crystal display. 5,462,822, Cl. 430-7.000.

Roquette Freres: *See—*

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Rosa, Richard P.: *See—*

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Rose, Anita: *See—*

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Rose, Keith J.; and Rose, William S. Wood burning furnace. 5,462,043, Cl. 126-110.00R.

Rose, William S.: *See—*

Rose, Keith J.; and Rose, William S., 5,462,043, Cl. 126-110.00R.

Rosedale Products, Inc.: *See—*

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Rosen, Jonathan J.; and Larsen, Charles E., to Novoste Corporation. Automatic fluid control valve. 5,462,255, Cl. 251-149.600.

Rosen Motors, L.P.: *See—*

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Rosenberg, Robert: *See—*

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Rosenberg, Steven. High efficiency, low voltage adapter apparatus and method. 5,463,307, Cl. 323-300.000.

Rosengard, Jordan L.: *See—*

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Rosfjord, Thomas J.: *See—*

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Rosthal, Richard A.: *See—*

  - Bonner, Stephen D.; Rosthal, Richard A.; Bagersh, Abdullah A.; Luling, Martin G.; and Jundt, Jacques A., 5,463,320, Cl. 324-366.000.
- Rosthauser, James W.: *See—*
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- Rote, Bruce J.: *See—*
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- Rotecno AG: *See—*
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- Roth, Andreas: *See—*
  - Eidam, Manfred; Flanhardt, Michael; Rauschenbach, Stefan; and Roth, Andreas, 5,462,131, Cl. 180-14.400.
- Roth, Peter M.: *See—*
  - Miess, Georg-Emerich; Roth, Peter M.; Heinrich, Karl; and Rewitzer, Siegfried, 5,462,643, Cl. 203-72.000.
- Roth, Richard; Miller, Paul D.; and Plumb, William L., to Queens Group, Inc. Media disk storage container. 5,462,159, Cl. 206-310.000.
- Roth, Rudolf; and Van Offenbeek, Johannes C., to U.S. Philips Corporation. System for recording and reading information on a record carrier at a constant scanning speed independent of the bit rate of such information. 5,463,607, Cl. 369-60.000.
- Roth, Scott R. Concrete breaking apparatus. 5,462,387, Cl. 404-90.000.
- Rothenberger, Richard E. Micro-power connector. 5,462,440, Cl. 439-66.000.
- Rothenstein, Uwe: *See—*
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- Rothmans, Benson & Hedges Inc.: *See—*
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- Roto-Mix Enterprises, Ltd.: *See—*
  - Neier, Benjamin R., 5,462,354, Cl. 366-314.000.
- Rottinghaus, Michael: *See—*
  - Thompson, Bruce A.; Van Maren, David J.; McCarthy, John G.; Purcell, R. Andrew; and Rottinghaus, Michael, 5,463,772, Cl. 395-600.000.
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- Rounds, Allan, to Albion Industries, Inc. Seal for swivel caster assembly. 5,461,753, Cl. 16-21.000.
- Rousset, Abel; and Devaux, Xavier, to Centre National De La Recherche Scientifique (C.N.R.S.). Composite alumina/metal powders, cermets made from said powders, and processes of production. 5,462,903, Cl. 501-127.000.
- Rovers, Willem P. G.: *See—*
  - Kist, Joost; Rovers, Willem P. G.; and Vanden Berghe, Dirk A., 5,462,063, Cl. 128-756.000.
- Rowenta-Werke GmbH: *See—*
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- Royal Appliance Mfg. Co.: *See—*
  - Cipolla, Mark E., 5,462,311, Cl. 285-7.000.
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- Royer, Tony A.; and Cowan, Mark, to M&M Precision Systems Corporation. Object measuring system. 5,461,797, Cl. 33-501.700.
- Ruarno-Casero, Ricardo: *See—*
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- Rubinstein, Daniel B.; and Rubinstein, Alan I. Bone marrow biopsy needle with cutting and/or retaining device at distal end. 5,462,062, Cl. 128-754.000.
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- Ruf, Ralph R.: *See—*
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  - Deneke, Bernard F.; Rumbold, James W.; and Scott, Clark B., 5,463,189, Cl. 174-138.00G.
- Rupp, Lothar: *See—*
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- Rupp, Walter, to Hoechst Aktiengesellschaft. Process for the preparation of aminoaryl β-sulfatoethyl sulfone compounds. 5,463,100, Cl. 558-29.000.
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- Russ, Keith M.: *See—*
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  - Sounik, James R.; Wilkison, William W., III; and Russ, Keith M., 5,463,141, Cl. 568-763.000.
- Russell Specialties Corporation: *See—*
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- Russell, Steve F.: *See—*
  - Papadakis, Emmanuel P.; Russell, Steve F.; and Wormley, Samuel J., 5,461,921, Cl. 73-628.000.
- Russo, Massimo: *See—*
  - Stevens-Wright, Debbie; Russo, Massimo; Nielsen, Peter; and Bertram, Paul, 5,462,527, Cl. 604-95.000.
- Ryan, Thomas A.: *See—*
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- Rydell, Mark A., to Everest Medical Corporation. Bipolar electrosurgical forceps. 5,462,546, Cl. 606-51.000.
- Ryu, Shiro: *See—*
  - Horiuchi, Yukio; and Ryu, Shiro, 5,463,461, Cl. 356-349.000.
- Ryu, Tadamitsu; Kakehi, Gen; and Aoe, Shigeru, to Fujitsu Limited. Database system having a plurality of nodes communicating with each other via communication network. 5,463,381, Cl. 340-825.150.
- S.A. des Etablissements Staubli (FRANCE): *See—*
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- S. C. Johnson & Son, Inc.: *See—*
  - Demarest, Scott W.; Corba, Robert E.; Miller, Allen D.; Fritz, John M.; and Shanklin, Donald J., 5,462,099, Cl. 141-3.000.
- S-Cal Research Corp.: *See—*
  - Gondouin, Michel, 5,462,120, Cl. 166-380.000.
- Sabo, John J.: *See—*
  - Markowitz, Arthur D.; and Sabo, John J., 5,463,547, Cl. 364-408.000.
- Sachs, Howard G., to Intergraph Corporation. Method and apparatus for translating virtual addresses in a data processing system having multiple instruction pipelines and separate TLB's for each pipeline. 5,463,750, Cl. 395-496.000.
- Sadayoshi, Kaju, to Ohno Co., Ltd. Tufting machine and method for producing tufted design in carpeting and product with tufted design. 5,461,996, Cl. 112-80.300.
- Saefkow, Michael W. K.: *See—*
  - Wollinsky, Kurt H.; and Saefkow, Michael W. K., 5,462,667, Cl. 210-645.000.
- Saeki, Yasuhiro: *See—*
  - Chujo, Takao; Hamano, Hisashi; Nishiyama, Masanori; Saeki, Yasuhiro; Ogawa, Tatsuya; and Endou, Kouhei, 5,463,015, Cl. 528-308.200.
- SafeSea Systems, Inc.: *See—*
  - Holland, Malcolm J.; and Rainey, Michael J., 5,463,598, Cl. 367-131.000.
- Sagawa, Tetsuya, to Whitaker Corporation, The. Electrical connector. 5,462,458, Cl. 439-752.000.
- Sagaz Industries, Inc.: *See—*
  - Wallach, Stewart; and Cabana, Jacqueline, 5,462,178, Cl. 211-95.000.
- Saha, Avijit, to International Business Machines Corporation. Method and apparatus for filling polygons. 5,463,723, Cl. 395-134.000.
- Sahni, Paramdeep S.: *See—*
  - Gaechter, Barbara I.; Sahni, Paramdeep S.; and Tseng, I. Grace, 5,463,685, Cl. 379-207.000.
- Sailor Pen Co., Ltd.: *See—*
  - Masumoto, Yasuhiro; and Shimada, Isao, 5,462,379, Cl. 401-213.000.
- Saint-Gobain Vitrage International: *See—*
  - Arnaud, Alain; and Morin, Claude, 5,462,596, Cl. 118-310.000.
- Saito, Atsushi: *See—*
  - Kirino, Fumiyoshi; Saito, Atsushi; Toda, Tsuyoshi; Ide, Hiroshi; Tsuchinaga, Hiroyuki; Maeda, Takeshi; and Kugiya, Fumio, 5,463,600, Cl. 369-13.000.
- Saito, Hitoshi: *See—*
  - Takao, Shino; Kometani, Shinji; and Saito, Hitoshi, 5,462,911, Cl. 503-227.000.
- Saito, Masashi: *See—*
  - Tsuji, Takeshi; and Saito, Masashi, 5,462,449, Cl. 439-188.000.
- Saito, Noriaki; Morimoto, Takashi; Takebe, Kazuo; Shiomi, Yutaka; Naitoh, Shigeki; and Kanagawa, Shuichi, to Sumitomo Chemical Co., Ltd. Polyhydric phenol, and epoxy resin and epoxy resin composition derived therefrom. 5,462,997, Cl. 525-507.000.
- Saito, Noritoshi: *See—*
  - Otomo, Shigekazu; Kumasaka, Noriyuki; Shiiki, Kazuo; Yamashita, Takeo; Saito, Noritoshi; and Tarutani, Yoshinobu, 5,463,518, Cl. 505-171.000.
- Saito, Osamu, to Fuji Photo Film Co., Ltd. Image signal processing device for thinning images. 5,463,419, Cl. 348-233.000.
- Saito, Tetsuo: *See—*
  - Yamada, Hiromichi; Ohkubo, Masaharu; Ojima, Masaki; Sasame, Hiroshi; Kawana, Takashi; Seto, Kaoru; Mano, Hiroshi; Saito, Tetsuo; Kashihara, Atsushi; and Ito, Michio, 5,463,473, Cl. 358-300.000.
- Saito, Tsutou: *See—*
  - Shibano, Yoshihide; and Saito, Tsutou, 5,462,604, Cl. 134-1.000.
- Saito, Yoshihiro; and Kittaka, Yoshiaki, to Mitsubishi Denki Kabushiki Kaisha. Memory control unit and associated method for changing the number of wait states using both fixed and variable delay times based upon memory characteristics. 5,463,756, Cl. 395-494.000.
- Saitoh, Tadashi: *See—*
  - Taniai, Takayoshi; Satoh, Hajime; Shimura, Hidetoshi; and Saitoh, Tadashi, 5,463,740, Cl. 395-299.000.
- Saitoh, Takenori, to NEC Corporation. Instruction buffer controller in processor enabling direct refetching of an instruction. 5,463,737, Cl. 395-496.000.
- Saitou, Tsuyoshi: *See—*
  - Yuhta, Toshio; Nishimura, Ikuya; Kano, Daijiro; Saitou, Tsuyoshi; Suzuki, Tomita; and Tanaka, Mamoru, 5,462,362, Cl. 384-13.000.
- Sakaguchi, Hotaka: *See—*
  - Nohmi, Yasuhiro; Yamaguchi, Tadashi; Matsuzawa, Kimio; Katagiri, Naoki; and Sakaguchi, Hotaka, 5,463,188, Cl. 174-108.000.

- Sakaguchi, Masahiko: *See—*
  - Nishida, Junichi; Araki, Morio; Arakawa, Takeharu; Ishida, Tessho; Ayukai, Yasushiro; Baba, Toshiharu; Sakaguchi, Masahiko; Nobe, Kenichi; Kaneko, Michihiro; and Shinohara, Jun, 5,463,605, Cl. 369-58.000.
- Sakaguchi, Shozo: *See—*
  - Koyano, Hitoshi; and Sakaguchi, Shozo, 5,462,341, Cl. 303-9.750.
- Sakaguchi, Yasuo: *See—*
  - Nukada, Katsumi; Imai, Akira; Daimon, Katsumi; Iijima, Masakazu; Mashimo, Kiyokazu; Sakaguchi, Yasuo; and Takegawa, Ichiro, 5,463,043, Cl. 540-141.000.
- Sakai, Hiroshi: *See—*
  - Ohwaki, Tatsuya; and Sakai, Hiroshi, 5,462,869, Cl. 435-212.000.
- Sakai, Katsuma: *See—*
  - Okamura, Okiyoshi; Sakai, Katsuma; and Yoshimura, Mitsunori, 5,462,816, Cl. 429-18.000.
- Sakai, Katsunori: *See—*
  - Yamamori, Teruo; Harada, Hiroshi; Sakai, Katsunori; Iwaki, Kazumi; and Matsunaga, Kazuki, 5,462,936, Cl. 514-211.000.
- Sakai, Yoshihiko; and Yamada, Takayuki, to Fuji Xerox Co., Ltd. Method of manufacturing a semiconductor element. 5,462,886, Cl. 437-41.000.
- Sakaino, Yoshiki: *See—*
  - Kawamoto, Fumio; Sakaino, Yoshiki; and Yoshida, Shohei, 5,462,824, Cl. 430-501.000.
- Sakakibara, Yasubumi; and Misue, Kazuo, to Fujitsu Limited. Building of a document classification tree by recursive optimization of keyword selection function. 5,463,773, Cl. 395-600.000.
- Sakakibara, Yuji: *See—*
  - Nagami, Tetsuo; Ogura, Yoshitsugu; Ogai, Masahiko; Fukushima, Yoshiaki; Inagaki, Shinji; Fukumoto, Kazuhiro; Banno, Kouji; Sakakibara, Yuji; Takada, Yasuo; Ohta, Takashi; Okada, Akane; Yamada, Yukimura; Hayashi, Kiyotaka; Matsuura, Shinji; and Kuroda, Kaz, 5,462,905, Cl. 502-232.000.
- Sakamoto, Akihiko; Takahashi, Tadashi; and Ninomiya, Masayuki, to Nippon Electric Glass Co., Ltd. Fire-protection and safety glass panel. 5,462,805, Cl. 428-430.000.
- Sakamoto, Ryo: *See—*
  - Onoue, Takashi; Araki, Kiyoshi; Ishida, Noriya; Kitamura, Toshiya; Niitsu, Yasuhiko; Yanagisawa, Makiko; Sakamoto, Ryo; and Sato, Fumihiro, 5,462,821, Cl. 429-218.000.
- Sakao, Masato, to NEC Corporation. Semiconductor memory device having improved isolation structure among memory cells. 5,463,236, Cl. 257-306.000.
- Sakata, Shigekazu: *See—*
  - Kai, Osamu; Muroi, Junichi; Suzuki, Nobuo; Takagi, Tatsumi; Sakata, Shigekazu; and Oikawa, Hideyuki, 5,463,679, Cl. 379-145.000.
- Saksena, Sanjeev; Sulek, Stanislaw; and Hussein, Hany M. G., to Energy Life System Corporation. Continuous heart tissue mapping and lasing catheter. 5,462,544, Cl. 606-15.000.
- Sakuda, Mitsuhiro: *See—*
  - Isoda, Hideo; Hamaguchi, Tadaaki; Sakuda, Mitsuhiro; and Yamada, Yasushi, 5,462,793, Cl. 428-297.000.
- Sakurada, Hiroshi: *See—*
  - Kawasaki, Hiroaki; Sakurada, Hiroshi; Narushima, Shinichi; Iwasa, Tadashi; and Yamaguchi, Hiroshi, 5,463,276, Cl. 313-496.000.
- Sakurai, Katsukiyo: *See—*
  - Matsuda, Takehisa; Moghaddam, Minoo J.; and Sakurai, Katsukiyo, 5,462,976, Cl. 522-74.000.
- Sakurai, Kensuke: *See—*
  - Konoike, Toshiro; Araki, Yoshitaka; Hayashi, Tetsuyoshi; Sakurai, Kensuke; and Tozyo, Takehiko, 5,463,107, Cl. 560-43.000.
- Sakurai, Naoki; and Sugawara, Yoshitaka, to Hitachi, Ltd. Dielectric isolated high voltage semiconductor device. 5,463,243, Cl. 257-524.000.
- Sakurai, Tomohisa; Nagaoka, Yukiko; Kubota, Tetsumaru; and Ikeda, Yuichi, to Olympus Optical Co., Ltd. Ultrasonic therapeutic apparatus. 5,462,522, Cl. 604-22.000.
- Salama, Kamel; and Selvamanickam, Venkatakrishnan, to University of Houston-University Park. Process of preparing superconductive oxide complexes containing L, Ba, Cu and O and method of using the same. 5,462,917, Cl. 505-150.000.
- Salazar, Mariano: *See—*
  - Ngoc, Hung D.; and Salazar, Mariano, 5,462,993, Cl. 525-274.000.
- Saldana, Daniel M.: *See—*
  - Clupper, Charles B.; Emigh, Jonathan D.; Mulkey, Steven L.; Fehringer, Robert L.; Flickner, Brett J.; Saldana, Daniel M.; and Delfer, Frank W., III, 5,462,399, Cl. 414-790.300.
- Salemme, Francis R.: *See—*
  - Agrafiotis, Dimitris K.; Bone, Roger F.; Salemme, Francis R.; and Soll, Richard M., 5,463,564, Cl. 364-496.000.
- Salemi, John V.: *See—*
  - Schmuck, Phillip W.; Hayter, Steven R.; Zachman, James R.; and Salemi, John V., 5,462,121, Cl. 166-383.000.
- Salomon S.A.: *See—*
  - Paris, Jean; and Chemello, Jean-Pierre, 5,461,802, Cl. 36-121.000.
- Salzman, Phil: *See—*
  - Fishkin, Boris; and Salzman, Phil, 5,463,460, Cl. 356-339.000.
- Samelius, Anders; Ohlson, Björn; and Lindström, Stefan, to ETP Transmission AB. Chuck having an integrated cone or machine spindle. 5,462,293, Cl. 279-4.030.
- Sampath, Vijay R.: *See—*
  - Pedersen, Michael J.; Sampath, Vijay R.; and Litchfield, James F., 5,462,719, Cl. 422-195.000.
- Samson, Gene; Engelson, Erik T.; Chee, Hiram; and Woodard, Robert E., to Target Therapeutics, Inc. Drug delivery system. 5,462,523, Cl. 604-30.000.
- Samsung Aerospace Industries, Ltd.: *See—*
  - Kim, Jung G., 5,463,301, Cl. 318-801.000.
- Samsung Electronics Co., Ltd.: *See—*
  - Han, Hong-Su, 5,463,714, Cl. 395-2.740.
  - Kang, Kwang S., 5,463,207, Cl. 219-708.000.
  - Lee, Kab Y.; Yoo, Hee-Sang; and Jang, Young C., 5,461,875, Cl. 62-89.000.
  - Song, Moon J., 5,463,289, Cl. 315-384.000.
  - Yamamura, Nobuyuki, 5,463,481, Cl. 359-53.000.
- Samuni, Amram: *See—*
  - Mitchell, James B.; Samuni, Amram; DeGraff, William; and Hahn, Stephen, 5,462,946, Cl. 514-315.000.
- Sanada, Kohji, to NEC Corporation. Semiconductor device incorporating voltage reduction circuit therein. 5,463,585, Cl. 365-201.000.
- Sanchika, Kouzoh: *See—*
  - Miyazaki, Tsuyoshi; Sanchika, Kouzoh; Nishida, Mitsuhiro; Yasukohchi, Tohru; Kitano, Shigeru; Suginaka, Akinori; and Kadoma, Yoshihito, 5,463,066, Cl. 548-112.000.
- Sandberg, Lars G.: *See—*
  - Kihlberg, Reinhold; Lindgren, Svante B.; and Sandberg, Lars G., 5,462,924, Cl. 574-12.000.
- Sanders, Clifton G.: *See—*
  - Hu, Chen-Ze; Dolence, Eric K.; Osaki, Shigemasa; and Sanders, Clifton G., 5,463,010, Cl. 528-25.000.
- Sanderson, Paul H. Feed chute-to-gun ammunition belt guide adapter for machine guns. 5,461,963, Cl. 89-37.220.
- Sanderson, Stephen J., to BKL, Inc. Drive circuit for electroluminescent lamp. 5,463,283, Cl. 315-209.00R.
- Sanderson, William: *See—*
  - Sankey, John P.; Sanderson, William; and Horne, Graham R., 5,463,112, Cl. 562-2.000.
- Sandia Corporation: *See—*
  - Ashby, Carol I. H.; Hohimer, John P.; Neal, Daniel R.; and Vawter, G. Allen, 5,463,649, Cl. 372-40.000.
- Sandoval, Gerald A.: *See—*
  - Ward, Dennis M.; Aerts, Ronny A. W.; Meijer, Jean-Pierre; Amswald, Silke; Sandoval, Gerald A.; and Schneemann, Herbert, 5,463,555, Cl. 364-468.000.
- Sandoval, Guillermo C.; Toledo, Sergio E. M.; and Garcia, Martha T. Z. Phenyl alcohol amides having anticonvulsant activity. 5,463,125, Cl. 564-170.000.
- Sandoz Ltd.: *See—*
  - Curtis, Ralston; Jain, Rakesh; Creech, David C.; and Fitch, William L., 5,462,915, Cl. 504-323.000.
  - Leitner, Harald; Wörther, Rudolf H.; Korntner, Horst; Schneider, Rudolf; Auer, Engelbert; Kores, Dietmar; and Tramberger, Hermann, 5,462,914, Cl. 504-238.000.
- Sandstrom, Paul H., to Goodyear Tire & Rubber Company, The. Sulfur cured rubber composition containing epoxidized natural rubber and carboxylated nitrile rubber. 5,462,979, Cl. 523-438.000.
- Sandvik AB: *See—*
  - During, Niclas; and Weinl, Gerold, 5,462,574, Cl. 75-238.000.
- Sankei Giken Kogyo Kabushiki Kaisha: *See—*
  - Ikeda, Tsukasa; and Tamano, Akihiko, 5,461,777, Cl. 29-890.080.
- Sankey, John P.; Sanderson, William; and Horne, Graham R., to Solvay Interox Limited. Peroxycompounds. 5,463,112, Cl. 562-2.000.
- Sano, Akira; Shiraishi, Takeichi; Suzuki, Kunihiro; Okamoto, Mitsuo; Usui, Katumi; Shimizu, Hiroyuki; and Matsuura, Kazuo, to Nippon Oil Company, Limited. Process for preparing polyolefins. 5,463,001, Cl. 526-124.500.
- Sano, Atsunori: *See—*
  - Sumino, Motoshige; Tani, Tsutomu; and Sano, Atsunori, 5,463,075, Cl. 548-365.100.
- Sanofi: *See—*
  - Barth, Francis; Casellas, Pierre; Congy, Christian; Martinez, Serge; and Rinaldi, Murielle, 5,462,960, Cl. 514-406.000.
  - Guzzi, Umberto; Palmieri, Costantino; and Croci, Tiziano, 5,462,945, Cl. 514-277.000.
- Sanshin Kogyo Kabushiki Kaisha: *See—*
  - Morita, Toshimasa, 5,461,940, Cl. 74-603.000.
- Santel, Hans-Joachim: *See—*
  - Fischer, Reiner; Bretschneider, Thomas; Krüger, Bernd-Wieland; Erdelen, Christoph; Santel, Hans-Joachim; Lürssen, Klaus; Schmidt, Robert R.; Wachendorff-Neumann, Ulrike; and Stendel, Wilhelm, 5,462,913, Cl. 504-138.000.
- Sanyo Electric Co., Ltd.: *See—*
  - Kanayama, Hideyuki; Amano, Ryuhei; Yamauchi, Kenji; and Kanatani, Keiichi, 5,463,434, Cl. 353-94.000.
- Sanzo, Roger F.: *See—*
  - Jones, William C., Jr.; Polley, Richard B.; and Sanzo, Roger F., 5,462,139, Cl. 188-206.00R.
- Sara Lee Corporation: *See—*
  - Funderburk, C. Michael; Jordan, P. Kurt; Newman, John A.; McEwen, J. C.; and Howell, David C., 5,461,998, Cl. 112-306.000.
- Sarfert, Andreas: *See—*
  - Langen, Hans-Jürgen; Vollmer, Jürgen; and Sarfert, Andreas, 5,462,303, Cl. 280-455.100.

- Samicki, John T.; and Berg, Thomas R., to Standard Car Truck Company. Diagonally braced rail truck with improved end block. 5,461,986, Cl. 105-165.000.
- Sarpeshkar, Rahul; and Mead, Carver A., to California Institute of Technology. CMOS low-power, wide-linear-range, well-input differential and transconductance amplifiers. 5,463,348, Cl. 330-253.000.
- Sarver, Donald L. Closed loop air-cycle heating and cooling system. 5,462,110, Cl. 165-48.100.
- Sasaki, Fumihiro: *See—*
  - Sugiyama, Norihide; Nakamura, Masaru; Moriyama, Sumihiro; and Sasaki, Fumihiro, 5,462,586, Cl. 96-13.000.
- Sasaki, Hiroshi: *See—*
  - Crivello, James V.; and Sasaki, Hiroshi, 5,463,084, Cl. 549-214.000.
- Sasaki, Masaomi: *See—*
  - Shimada, Tomoyuki; Sasaki, Masaomi; Hashimoto, Mitsuru; and Aruga, Tamotsu, 5,462,826, Cl. 430-59.000.
- Sasaki, Michio: *See—*
  - Yamashita, Hirofumi; Inoue, Ikuko; Sasaki, Michio; and Miyagawa, Ryohei, 5,463,232, Cl. 257-223.000.
- Sasaki, Mitsuhiro: *See—*
  - Yasuda, Shin-ichiro; Kawabe, Kuniyasu; and Sasaki, Mitsuhiro, 5,463,454, Cl. 355-290.000.
- Sasaki, Nobuyoshi: *See—*
  - Kamiyama, Shiro; Kosugi, Masanori; Kurata, Masahiro; Shiraishi, Sadao; and Sasaki, Nobuyoshi, 5,462,634, Cl. 216-85.000.
- Sasaki, Shinichi: *See—*
  - Watanabe, Kazushi; Sasaki, Shinichi; Ikemoto, Isao; Miyabe, Shigeo; and Noda, Shinya, 5,463,446, Cl. 355-200.000.
- Sasaki, Teruhiko: *See—*
  - Takito, Tetsuo; Inaba, Kazuki; Kinoshita, Yasuo; and Sasaki, Teruhiko, 5,462,650, Cl. 208-58.000.
- Sasame, Hiroshi: *See—*
  - Inoue, Takahiro; Goto, Masahiro; Sasame, Hiroshi; Tsukida, Shinichi; and Takano, Manabu, 5,463,450, Cl. 355-219.000.
  - Yamada, Hiromichi; Ohkubo, Masaharu; Ojima, Masaki; Sasame, Hiroshi; Kawana, Takashi; Seto, Kaoru; Mano, Hiroshi; Saito, Tetsuo; Kashihara, Atsushi; and Ito, Michio, 5,463,473, Cl. 358-300.000.
- Sasib S.p.A.: *See—*
  - Spada, Valter; and Tosi, Giuseppe, 5,461,841, Cl. 53-234.000.
- Sasou, Hiroshi; Kaya, Tomoki; Watanabe, Tosiaki; and Fukaya, Shinji, to Tamura Electric Works, Ltd. Task processing apparatus. 5,463,208, Cl. 235-380.000.
- Sasse, Thomas, to August Bilstein GmbH & Co. KG. Controllable shock absorber for motor vehicles. 5,462,143, Cl. 188-299.000.
- Sassmannshausen, Werner; Menzel, Karl-Heinz; Sassmannshausen, Werner; Schreiber, Stefan; Kleindienst, Anke; and Günther, Hubert, to SONOR Johs. Link GmbH. Membranophone and damping member for a membranophone. 5,461,959, Cl. 84-421.000.
- Sassmannshausen, Werner: *See—*
  - Sassmannshausen, Werner; Menzel, Karl-Heinz; Sassmannshausen, Werner; Schreiber, Stefan; Kleindienst, Anke; and Günther, Hubert, 5,461,959, Cl. 84-421.000.
- Sater, Ghaleb A.: *See—*
  - Bolanos, Henry; Sater, Ghaleb A.; DeFonzo, Stephan A.; and Young, Wayne P., 5,462,555, Cl. 606-120.000.
- Satija, Sunil; Wade, Daniel M.; and Reynolds, Ronald C., to Atohaas B.V. Process for coloring thermoplastics. 5,462,709, Cl. 264-211.000.
- Sato, Chuichi; Tsukamoto, Shigemi; and Shinno, Hidenori, to NSK Ltd. Electrorheological fluid damper for a slide mechanism. 5,462,361, Cl. 384-9.000.
- Sato, Fumihiro: *See—*
  - Onoue, Takashi; Araki, Kiyoshi; Ishida, Noriya; Kitamura, Toshiya; Niitsu, Yasuhiko; Yanagisawa, Makiko; Sakamoto, Ryo; and Sato, Fumihiro, 5,462,821, Cl. 429-218.000.
- Sato, Hirotaka: *See—*
  - Waki, Masaki; Kasai, Junichi; Aoki, Tsuyoshi; Honda, Toshiyuki; and Sato, Hirotaka, 5,463,253, Cl. 257-724.000.
- Sato, Katsuyuki: *See—*
  - Shinbo, Yutaka; Kajimoto, Takeshi; Kobayashi, Mitsuteru; and Sato, Katsuyuki, 5,463,249, Cl. 257-690.000.
- Sato, Kenichi: *See—*
  - Mukai, Hidehito; Sato, Kenichi; and Shibuta, Nobuhiro, 5,462,920, Cl. 505-432.000.
- Sato, Masahito; Tajima, Kazuaki; Matsuda, Yoshio; and Miyamoto, Takahumi, to Mitsubishi Denki Kabushiki Kaisha. Method for manufacturing a curved surface multi-layer wiring board. 5,462,838, Cl. 430-313.000.
- Sato, Susumu: *See—*
  - Esaki, Toshiro; Suzuki, Mituru; Sato, Susumu; Takahashi, Kohichi; and Shimizu, Makoto, 5,462,240, Cl. 242-348.100.
- Sato, Takaaki: *See—*
  - Nakamura, Yusuke; and Sato, Takaaki, 5,463,026, Cl. 530-387.900.
- Sato, Takehiro; Kinosita, Kimiaki; Kaeriyama, Minoru; and Hidaka, Tomoya, to Nippon Soda Co., Ltd. Phenethyl alcohol derivative and recording material containing the same. 5,463,133, Cl. 568-33.000.
- Sato, Takuro: *See—*
  - Fukasawa, Atsushi; Kawabe, Manabu; Kawahashi, Akiyoshi; and Sato, Takuro, 5,463,660, Cl. 375-205.000.
- Sato, Toshio: *See—*
  - Muroi, Takashiro; Sato, Toshio; Ito, Ikuo; and Takeda, Kyoichi, 5,463,156, Cl. 585-400.000.
  - Oka, Nobuyuki; Sato, Toshio; and Mizuki, Masayuki, 5,463,602, Cl. 369-44.290.
- Sato, Yoshifumi: *See—*
  - Shiokawa, Yoshihiro; Takefumi, Tadayoshi; Matsumoto, Shunichi; and Sato, Yoshifumi, 5,463,095, Cl. 554-130.000.
- Sato, Yoshitoshi: *See—*
  - Yano, Keiichi; Takahashi, Takashi; Kimura, Kazuo; Sato, Yoshitoshi; Yamakawa, Kouji; Yamamoto, Toshishige; Fujü, Masafumi; Hashimoto, Shizuki; and Takamichi, Hiroshi, 5,463,248, Cl. 257-677.000.
- Sato, Yoshitsugu: *See—*
  - Watanabe, Makoto; Mochizuki, Isao; Sato, Yoshitsugu; Takagi, Takeyuki; and Okada, Hiroaki, 5,463,195, Cl. 200-5.00A.
- Satoh, Hajime: *See—*
  - Taniai, Takayoshi; Satoh, Hajime; Shimura, Hidetoshi; and Saitoh, Tadashi, 5,463,740, Cl. 395-299.000.
- Saturn Corporation: *See—*
  - Milunas, Rimas S., 5,463,551, Cl. 364-426.020.
- Sauerwein, Heinrich; and Arm, Wolfgang, to ACO Severin Ahlmann GmbH & Co., KG. Surface drainage apparatus. 5,462,382, Cl. 404-2.000.
- Saul, Jerome P.: *See—*
  - Brucker, Greg G.; Saul, Jerome P.; and Savage, Steven D., 5,462,521, Cl. 604-20.000.
- Saunders, William T., to Weirton Steel Corp. Convenience-feature sheet metal end closure and tooling apparatus. 5,462,396, Cl. 413-67.000.
- Saupe, Timothy P., to Goodyear Tire & Rubber Company, The. Adhesion of halopolymers to nylon. 5,462,091, Cl. 138-126.000.
- Savage, John M., Jr. Lens assembly for use with LEDs. 5,463,502, Cl. 359-819.000.
- Savage, Steven D.: *See—*
  - Brucker, Greg G.; Saul, Jerome P.; and Savage, Steven D., 5,462,521, Cl. 604-20.000.
- Sawada, Hirokazu; Uesugi, Akio; and Matsuki, Masaya, to Fuji Photo Film Co., Ltd. Method of producing support for planographic printing plate. 5,462,614, Cl. 148-551.000.
- Sawai, Yasunori, to NEC Corporation. Semi-flash type A/D converter employing a correction encoder for eliminating errors in the output signals due to noise, and a corresponding method therefor. 5,463,395, Cl. 341-156.000.
- Sawhney, Amarpreet: *See—*
  - Hubbell, Jeffrey A.; Elbert, Donald; Hill-West, Jennifer L.; Drumheller, Paul D.; Chowdhury, Sanghamitra; and Sawhney, Amarpreet, 5,462,990, Cl. 525-54.100.
- Sawyer, J. Scott: *See—*
  - Baker, S. Richard; Dillard, Robert D.; Floreancig, Paul E.; Sawyer, J. Scott; and Sofia, Michael J., 5,462,954, Cl. 514-381.000.
- Saxena, Vinit; and Young, Paul, to Sepragen Corporation. Chromatography column. 5,462,659, Cl. 210-198.200.
- Schaarschmidt, Manfred: *See—*
  - Krämer, Rudolf; and Schaarschmidt, Manfred, 5,462,454, Cl. 439-571.000.
- Schacher, Gottlieb: *See—*
  - Koch, Bruno; and Schacher, Gottlieb, 5,462,715, Cl. 422-64.000.
- Schegk, Claus-Detlef, to ABB Management AG. Exhaust gas turbocharger and method of operation. 5,461,860, Cl. 60-611.000.
- Schelbert, Ulrich: *See—*
  - von Wedel, Wedigo; Eickhoff, Hubertus; Weck, Manfred; Tarabocchia, John; Schelbert, Ulrich; and Möller, Alexander, 5,463,170, Cl. 588-207.000.
- Schelle, Siegfried: *See—*
  - Roesler, Richard; Schelle, Siegfried; Gnann, Michael; and Zeiss, Werner, 5,462,692, Cl. 252-186.260.
- Schering Corporation: *See—*
  - Hou, Donald; Draper, Richard W.; Lee, Gary M.; Mas, Janet L.; and Mergelsberg, Ingrid, 5,463,051, Cl. 540-576.000.
  - Shih, Neng-Yang; Aslanian, Robert; Lupo, Andrew, Jr.; Piwinski, John J.; Green, Michael J.; and Ganguly, Ashit K., 5,463,074, Cl. 548-314.700.
- Scherkenbeck, Jürgen; Himmler, Thomas; Böhm, Stefan; Hagemann, Hermann; Stroech, Klaus; Dutzmann, Stefan; Dehne, Heinz-Wilhelm; and Hänssler, Gerd, to Bayer Aktiengesellschaft. Azolylmethylfluorocyclopropyl derivatives. 5,462,955, Cl. 514-383.000.
- Schiavone, Robert J. Calf cruncher exercise equipment. 5,462,508, Cl. 482-122.000.
- Schieve, Eric; and Finch, Richard, to Dell USA, L.P. System and method for loading diagnostics routines from disk. 5,463,766, Cl. 395-650.000.
- Schildberg, Hans-Peter: *See—*
  - Hagemeyer, Alfred; Schildberg, Hans-Peter; Hibst, Hartmut; Baeuerle, Dieter; and Heitz, Johannes, 5,462,701, Cl. 264-482.000.
  - Keller, Harald; Jaeger, Ulrich; Steininger, Helmut; Kopke, Helmut; Schomann, Klaus D.; and Schildberg, Hans-Peter, 5,462,810, Cl. 428-694.00T.
- Schilling, Anne: *See—*
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- Schimitzek, Ralph: *See—*
  - Jakob, Gert; and Schimitzek, Ralph, 5,462,344, Cl. 303-119.200.
- Schinazi, Raymond F.; and Liotta, Dennis C. Sensitizing agents for use in boron neutron capture therapy. 5,462,724, Cl. 424-1.770.
- Schindler, Peter: *See—*
  - Hemmerle, Horst; Schindler, Peter; and Herling, Andreas, 5,463,062, Cl. 546-168.000.

Schipper, Jacques: *See—*
  Hartog, Jan; Van Steen, Bartholomeus J.; Mos, Johannes; and Schipper, Jacques, 5,462,942, Cl. 514-254.000.
Schlein, Barry C.: *See—*
  Snyder, Timothy S.; Rosfjord, Thomas J.; McVey, John B.; Hu, Aaron S.; and Schlein, Barry C., 5,461,865, Cl. 60-737.000.
Schlenker, Donald D. Anti-rotation clamp for gated irrigation pipe. 5,462,246, Cl. 248-49.000.
Schlenker, Michael: *See—*
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Schlenz, Rolf: *See—*
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Schlerkmann, Hubertus: *See—*
  Von Hagen, Ingo; Popperling, Rolf; Schlerkmann, Hubertus; and Zeislmair, Ulrike, 5,462,615, Cl. 148-592.000.
Schlitzer, Ronald L.; Dassanayake, N. L.; and Bhatia, Rajkumar P., to Alcon Laboratories, Inc. Double redox system for disinfecting contact lenses. 5,462,713, Cl. 422-37.000.
Schlosser, Sandra J.: *See—*
  Beausoleil, William F.; Berghorn, Charles R.; Hupcey, John A.; and Schlosser, Sandra J., 5,463,754, Cl. 395-200.080.
Schlumberger Technology Corporation: *See—*
  Bonner, Stephen D.; Rosthal, Richard A.; Bagersh, Abdullah A.; Luling, Martin G.; and Jundt, Jacques A., 5,463,320, Cl. 324-366.000.
  Dussan V., Elizabeth B.; Auzerais, François M.; and Anderson, Barbara I., 5,463,549, Cl. 364-422.000.
Schmale, Gerhard; Sommer, Norbert; and Zynda, Martin, to Naue/Johnson Controls Engineering Verwaltungs GmbH. Sitting section of a vehicle seat. 5,462,339, Cl. 297-452.550.
Schmerler, Michael: *See—*
  Riedel, Hans J.; and Schmerler, Michael, 5,462,481, Cl. 454-70.000.
Schmidt, David: *See—*
  Ogawa, Yasushi; Schmidt, David; and Dasch, James, 5,462,925, Cl. 514-12.000.
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Schmidt, Robert R.: *See—*
  Fischer, Reiner; Bretschneider, Thomas; Krüger, Bernd-Wieland; Erdelen, Christoph; Santel, Hans-Joachim; Lürssen, Klaus; Schmidt, Robert R.; Wachendorff-Neumann, Ulrike; and Stendel, Wilhelm, 5,462,913, Cl. 504-138.000.
Schmidt, Stanley J.: *See—*
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Schmuck, Phillip W.; Hayter, Steven R.; Zachman, James R.; and Salerni, John V., to Baker Hughes Incorporated. Failsafe liner installation assembly and method. 5,462,121, Cl. 166-383.000.
Schneemann, Herbert: *See—*
  Ward, Dennis M.; Aerts, Ronny A. W.; Meijer, Jean-Pierre; Arnswald, Silke; Sandoval, Gerald A.; and Schneemann, Herbert, 5,463,555, Cl. 364-468.000.
Schneider, Georg, to Koenig & Bauer Aktiengesellschaft. Press blanket cylinder with blanket end ejection device. 5,461,981, Cl. 101-415.100.
Schneider, Peter; Ramos, Gerardo; and Bersier, Jacques, to Ciba-Geigy Corporation. Intermediates for the manufacture of 4-acyloxy-3-hydroxyethylazetidinones. 5,463,047, Cl. 540-362.000.
Schneider, Richard F.: *See—*
  Subramanian, Gopal; and Schneider, Richard F., 5,463,030, Cl. 534-16.000.
Schneider, Rudolf: *See—*
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Schoenmaker, John; and Mathes, Gene R., to Raymond Corporation, The. Prevention of slack lift chains on a man-up lift truck. 5,462,136, Cl. 187-223.000.
Schohe, Rudolf; Glaser, Thomas; Traber, Jörg; and Allen, George S., to Bayer Aktiengesellschaft. Substituted basic 2-aminotetralin in pharmaceuticals. 5,463,105, Cl. 560-29.000.
Scholl, Rolland D.: *See—*
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Scholz, Wolfgang: *See—*
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Schomann, Klaus D.: *See—*
  Keller, Harald; Jaeger, Ulrich; Steininger, Helmut; Kopke, Helmut; Schomann, Klaus D.; and Schildberg, Hans-Peter, 5,462,810, Cl. 428-694.00T.
Schön, Norbert; Rechner, Johann; Wagner, Paul; Buysch, Hans-Josef; Gasche, Hans-Erich; and Leiberich, Ricarda, to Bayer Aktiengesellschaft. Process for the continuous production of aryl carbonates. 5,463,102, Cl. 558-274.000.
Schoo, Raul A. I. Composite pressure vessel. 5,462,193, Cl. 220-652.000.
Schreiber, Robert D.; Greenlund, Andrew C.; and Farrar, Michael A., to Washington University. Composition for inhibition of intracellular transcription. 5,463,023, Cl. 530-327.000.
Schreiber, Stefan: *See—*
  Sassmannshausen, Werner; Menzel, Karl-Heinz; Sassmannshausen, Werner; Schreiber, Stefan; Kleindienst, Anke; and Günther, Hubert, 5,461,959, Cl. 84-421.000.
Schricker, David R.: *See—*
  Boen, Charles G.; Hadank, John M.; McGuire, Kenneth J.; Schricker, David R.; and Scholl, Rolland D., 5,463,567, Cl. 364-551.010.
Schricker, Ulrich. Round electrical cable. 5,463,186, Cl. 174-36.000.
Schroeder, Alfred A., to Lancer Corporation. Disposable relief valve seat for positive displacement pump. 5,462,413, Cl. 417-310.000.
Schroeder, Edward A.; and Gallicchio, James, to Porter Athletic Equipment Company. Adjustable backboard assembly with drive lock. 5,462,269, Cl. 273-15.00R.
Schroeder, James B., to National Electrostatics Corp. Magnetically shielded high voltage electron accelerator. 5,463,268, Cl. 313-293.000.
Schroepfer, Richard C.; and Knisely, Edward E., Jr., to Whitaker Corporation, The. Overmold strain relief and snag prevention feature. 5,462,457, Cl. 439-736.000.
Schubert, Dietrich: *See—*
  Marek, Jiri; Schubert, Dietrich; Baumann, Helmut; Muenzel, Horst; Offenberg, Michael; and Willmann, Martin, 5,461,917, Cl. 73-514.160.
Schubert, John C.: *See—*
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Schueman Enterprises, Inc.: *See—*
  Schueman, Gerald L., 5,462,301, Cl. 280-149.200.
Schueman, Gerald L., to Schueman Enterprises, Inc. Means for mounting an air powered actuator for retracting the locking pins of a slider. 5,462,301, Cl. 280-149.200.
Schuerch, Heinz-Christoph: *See—*
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Schuette, Arthur P.: *See—*
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Schuler, Bernhard: *See—*
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Schuller International, Inc.: *See—*
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Schulman, Martin: *See—*
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Schultz, William J.: *See—*
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Schulz, David E.: *See—*
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Schulz, Paul: *See—*
  Noack, Wolf-Eckart; Schulz, Paul; and Tuller, F. Norman, 5,463,114, Cl. 562-421.000.
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  Brois, Stanley J.; Patil, Abhimanyu O.; Schulz, Wolfgang W.; Hsu, Chang S.; and Garner, Richard T., 5,462,680, Cl. 252-9.000.
Schündehütte, Karl K.: *See—*
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Schur, Henry B.: *See—*
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Schutte, Mark E.; Thatcher, William B.; and West, Lamar E., to Scientific-Atlanta. Interdiction method and apparatus with random mode jamming. 5,463,689, Cl. 380-7.000.
Schvester, Pascal: *See—*
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Schwandt, Brian W.: *See—*
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Schweikert, Emile A.: *See—*
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Schwendinger, Greg, to Intel Corporation. Instruction buffer for aligning instruction sets using boundary detection. 5,463,748, Cl. 395-375.000.
Schwimmer, Alan F., to Miles Inc. Modular bottle dispenser. 5,462,198, Cl. 221-130.000.
Scientific-Atlanta: *See—*
  Schutte, Mark E.; Thatcher, William B.; and West, Lamar E., 5,463,689, Cl. 380-7.000.
Scientific-Atlanta, Inc.: *See—*
  Massara, James M.; and Davis, Glenn A., 5,462,225, Cl. 236-47.000.
Scitex Digital Printing, Inc.: *See—*

  - McCann, James D.; and Mullins, Randal L., 5,463,415, Cl. 347-74.000.
- Scofield, Robert L.; and Pearce, Richard A., to Hunter Fan Company. Ceiling fan. 5,462,412, Cl. 416-210.00R.
- Scollard, Robert A. Deep root tree and shrub fertilizer stake drivers. 5,461,992, Cl. 111-7.200.
- Scott, Clark B.: *See—*
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- Scott Investment Partners: *See—*
  - Castle, Brian R.; and Scott, James J., 5,462,391, Cl. 405-302.200.
- Scott, James J.: *See—*
  - Castle, Brian R.; and Scott, James J., 5,462,391, Cl. 405-302.200.
- Scott, Richmond M.: *See—*
  - Tilman, Paul A.; Scott, Richmond M.; and Machacek, Zdenek, 5,462,360, Cl. 383-63.000.
- Scottish Crop Research Institute: *See—*
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- Scudder, James A.; and Berntsen, James L., to Insta-Heat, Inc. Container with integral module for heating or cooling the contents. 5,461,867, Cl. 62-4.000.
- Seagate Technology, Inc.: *See—*
  - Yaeger, John R., 5,463,514, Cl. 360-105.000.
- Sealed Air Corporation: *See—*
  - Lee, Shau-Tarng, 5,462,974, Cl. 521-79.000.
- Searfoss, William A. Adjustable rolling saw stand. 5,462,102, Cl. 144-287.000.
- Searson, Peter C.: *See—*
  - Macaulay, John M.; Searson, Peter C.; Duboc, Robert M., Jr.; and Spindt, Christopher J., 5,462,467, Cl. 445-50.000.
- SEB S.A.: *See—*
  - Louison, Bernard, 5,462,018, Cl. 119-86.000.
- Sebastiani, Oscar: *See—*
  - Malouvier, Dominique; Müller, Peter; and Sebastiani, Oscar, 5,462,061, Cl. 128-720.000.
- Sedergran, Thomas C.: *See—*
  - Godfrey, Jollie D., Jr.; Mueller, Richard H.; Sedergran, Thomas C.; and Soundararajan, Nachimuthu, 5,463,059, Cl. 546-21.000.
- Sedorcek, Frank J.; and Sedorcek, Jacqueline J. Sport utility seat for removable attachment to an open truck and bumper of an automobile. 5,462,334, Cl. 297-252.000.
- Sedorcek, Jacqueline J.: *See—*
  - Sedorcek, Frank J.; and Sedorcek, Jacqueline J., 5,462,334, Cl. 297-252.000.
- Seewaldt-Becker, Elke: *See—*
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- Seikagaku Kogyo Kabushiki Kaisha: *See—*
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- Seiko Corp.: *See—*
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- Seiko Epson Corp.: *See—*
  - Hoff, Don G.; and Ragan, Lawrence H., 5,463,626, Cl. 370-94.100.
  - Maruyama, Akira, 5,463,587, Cl. 365-210.000.
- Seiko Instruments Inc.: *See—*
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- Seiko Seiki Kabushiki Kaisha: *See—*
  - Oda, Yoshimasa; and Ota, Masato, 5,462,470, Cl. 451-294.000.
- Seisan Kaihatsu Kagaku Kenkyusho: *See—*
  - Shinjo, Teruya; Yamamoto, Hidefumi; Anno, Toshihiko; and Takada, Toshio, 5,462,795, Cl. 428-332.000.
- Seitz, Thomas; Klausener, Alexander; Berg, Dieter; Wachendorff-Neumann, Ulrike; Erdelen, Christoph; Hänssler, Gerd; Brandes, Wilhelm; and Dutzmann, Stefan, to Bayer Aktiengesellschaft. Substituted acetic acid esters useful as pesticides per se and as intermediates for substitued acrylic esters pesticides. 5,462,943, Cl. 514-256.000.
- Seki, Kazuhiro; Aoki, Takashi; Hirahara, Shinichi; and Motozawa, Yasuki, to Honda Giken Kogyo Kabushiki Kaisha. Occupant protecting system for vehicle. 5,462,308, Cl. 280-749.000.
- Seki, Masato: *See—*
  - Nitta, Tomio; Mifune, Hideo; Seki, Masato; Kaga, Yosimitu; and Serizawa, Noriyuki, 5,462,044, Cl. 126-262.000.
- Sekiguchi, Takuji: *See—*
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- Sekine, Takayuki: *See—*
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- Sekisui Chemical Co., Ltd.: *See—*
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- Sels, Francis: *See—*
  - Jansen, Benedictus; Roefs, André; Sels, Francis; Perdieus, Pieter; and Florens, Raymond, 5,462,831, Cl. 430-139.000.
- Seltzer, Edwin, to Roller Derby Skate Corporation. Homogeneous integrally molded skate and method for molding. 5,462,295, Cl. 280-11.190.
- Selvamanickam, Venkatakrishnan: *See—*
  - Salama, Kamel; and Selvamanickam, Venkatakrishnan, 5,462,917, Cl. 505-150.000.
- Sem, Thomas R., to Thermo King Corporation. Fuel filter system. 5,462,658, Cl. 210-172.000.
- Semiconductor Energy Laboratory Co., Ltd.: *See—*
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  - Yamazaki, Shunpei, 5,463,483, Cl. 359-58.000.
- Semple, Thomas C.: *See—*
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  - Powell, Joseph B.; Slaugh, Lynn H.; Forschner, Thomas C.; Semple, Thomas C.; and Weider, Paul R., 5,463,145, Cl. 568-867.000.
  - Slaugh, Lynn H.; Powell, Joseph B.; Forschner, Thomas C.; Semple, Thomas C.; and Weider, Paul R., 5,463,146, Cl. 568-862.000.
- Semura, Shigeru: *See—*
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- Sencorp Systems, Inc.: *See—*
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- Sener, Ingenieria Y Sistemas, S.A.: *See—*
  - Mendia, Jose I. I.; and Urruela, Jose R., 5,461,856, Cl. 60-230.000.
- Senko Kogyo Co., Ltd.: *See—*
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- Senn, James A.: *See—*
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- Seno, Yasuo: *See—*
  - Azuma, Toshiro; Seno, Yasuo; Kitagawara, Hiroshi; and Nemoto, Shusuke, 5,462,148, Cl. 192-48.300.
- Sensormatic Electronics Corporation: *See—*
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- Sepke, Arnold L., to White Consolidated Industries, Inc. Cedar air freshener for vacuum cleaner bags. 5,461,751, Cl. 15-246.300.
- Sepragen Corporation: *See—*
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- Serad, George A.; and Thornburg, Theodore S., to Hoechst Celanese Corporation. Separation of polyethylene terephthalate and polyvinyl chloride using supercritical carbon dioxide. 5,462,973, Cl. 521-62.000.
- Serizawa, Noriyuki: *See—*
  - Nitta, Tomio; Mifune, Hideo; Seki, Masato; Kaga, Yosimitu; and Serizawa, Noriyuki, 5,462,044, Cl. 126-262.000.
- Serizawa, Youji: *See—*
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- Serpelloni, Michel; and Ribadeau-Dumas, Guillaume, to Roquette Freres. Aerated and grainy confectionery product and process for manufacturing the said confectionery product. 5,462,760, Cl. 426-572.000.
- Servant, Jeanne D.; and Baumlin, Jean-Marie, to Eastman Kodak Company. Curtain coating device. 5,462,598, Cl. 118-324.000.
- Seshadri, Nambirajan: *See—*
  - Dorward, Sean M.; Jayant, Nuggehally S.; Johnston, James D.; Quackenbush, Schuyler R.; Seshadri, Nambirajan; and Sundberg, Carl-Erik W., 5,463,641, Cl. 371-374.000.
- Seto, Kaoru: *See—*
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- Seto, Masanori, to Fuji Xerox Co., Ltd. Light beam deflecting device. 5,463,490, Cl. 359-200.000.
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  - Adachi, Hideaki; Setsune, Kentaro; and Mizuno, Koichi, 5,462,921, Cl. 505-473.000.
- Seyler, Peter G., to Perfection Spring & Stamping Corp. Adjustable lumbar support for seat backs. 5,462,335, Cl. 297-284.400.
- Seymour, Theodore J.: *See—*
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- Sgarzi, Germano: *See—*
  - Marrucci, Paolo; Sgarzi, Germano; and Vitale, Fabio, 5,463,566, Cl. 364-516.000.
- SGB Holdings Ltd. for These Research & Development Dept. Holland: *See—*
  - Van Helmond, Johannes H. M., 5,462,134, Cl. 182-178.000.
- SGS-Thomson Microelectronics, Inc.: *See—*
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- SGS-Thomson Microelectronics, S.A.: *See—*
  - Pouet, Claude; and Collumeau, Yoland, 5,462,219, Cl. 228-49.500.
- Shaber, Steven H.; and Nguyen, Luong T., to Rohm and Haas Company. Fungicidal 2-heterocyclic-2,2-disubstituted-ethyl 1,2,4-triazoles. 5,462,931, Cl. 514-63.000.
- Shah, Manhar L., to MVM Electronics. Acousto-optic polychromatic light modulator. 5,463,493, Cl. 359-312.000.
- Shah, Rasiklal P.: *See—*
  - Cuddihy, Paul E.; and Shah, Rasiklal P., 5,463,768, Cl. 395-183.130.
- Sham, John C. K.; and Leung, Fan Kai, to Pentalpha Enterprises Ltd. Photosensitive switching apparatus for an electric appliance. 5,463,205, Cl. 219-502.000.
- Shamlou, Daryush: *See—*
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- Shamus: *See—*

  - Gutierrez, Marty R., 5,461,900, Cl. 72-479.000.
- Shanbaum, Suzanne P.: *See—*
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- Shanklin, Donald J.: *See—*
  - Demarest, Scott W.; Corba, Robert E.; Miller, Allen D.; Fritz, John M.; and Shanklin, Donald J., 5,462,099, Cl. 141-3.000.
- Shapiro, Ira. Device for hygienic protection of the teeth and gums. 5,462,067, Cl. 128-861.000.
- Shapiro, Jeffrey S.: *See—*
  - Calvo, Joseph, 5,462,407, Cl. 416-132.00A.
- Sharp Corporation: *See—*
  - Takatori, Sunao; Kumagai, Ryohei; Matsumoto, Koji; and Yamamoto, Makoto, 5,463,717, Cl. 395-24.000.
- Sharp, Fraser R.: *See—*
  - Novacek, Laurel A.; Sharp, Fraser R.; and McLean, Donald A., 5,462,531, Cl. 604-110.000.
- Sharp Kabushiki Kaisha: *See—*
  - Ishii, Yutaka, 5,462,621, Cl. 156-229.000.
  - Iwata, Toshinori; and Ota, Manabu, 5,462,085, Cl. 137-625.430.
  - Kitaguchi, Masanori, 5,463,362, Cl. 334-47.000.
  - Kumazawa, Ryoichi; and Nawaki, Masaru, 5,463,635, Cl. 371-21.100.
  - Matsunami, Mitsuo, 5,463,246, Cl. 257-621.000.
  - Negoto, Hidenori; Katayama, Mikio; Nakazawa, Kiyoshi; Kato, Hiroaki; Kanemori, Yuzuru; and Nagayasu, Takayoshi, 5,463,230, Cl. 257-66.000.
  - Suzuki, Hiroyuki, 5,463,501, Cl. 359-814.000.
  - Yoshida, Yukihiro, 5,463,573, Cl. 364-746.200.
- Shaw, Allan; and Luxton, Russell E., to Luminis Pty Ltd. Air conditioning for humid climates. 5,461,877, Cl. 62-185.000.
- Shearer, John R.; and Shelley, Philip, to Minnesota Mining and Manufacturing Company. Orthopaedic implant. 5,462,563, Cl. 623-18.000.
- Shei Kako Kabushiki Kaisha: *See—*
  - Shida, Masayuki, 5,461,731, Cl. 2-424.000.
- Sheldon, Paul C.; and Loerch, Richard J., to Giddings & Lewis, Inc. Tool changer configured for use with machine tools. 5,462,511, Cl. 483-1.000.
- Shell Oil Company: *See—*
  - Blackbourn, Robert L.; Allan, Edgar D.; Le, Loc B.; and Patel, Snehal, 5,463,136, Cl. 568-385.000.
  - Powell, Joseph B.; Slaugh, Lynn H.; Forschner, Thomas C.; Thomason, Terry B.; Semple, Thomas C.; Weider, Paul R.; and Arhancet, Juan P., 5,463,144, Cl. 568-867.000.
  - Powell, Joseph B.; Slaugh, Lynn H.; Forschner, Thomas C.; Semple, Thomas C.; and Weider, Paul R., 5,463,145, Cl. 568-867.000.
  - Singleton, David M.; and Murray, Brendan D., 5,463,143, Cl. 568-864.000.
  - Slaugh, Lynn H.; Powell, Joseph B.; Forschner, Thomas C.; Semple, Thomas C.; and Weider, Paul R., 5,463,146, Cl. 568-862.000.
- Shell Research Limited: *See—*
  - Pfrengle, Waldemar F. A., 5,462,944, Cl. 514-275.000.
- Sheller, Ken. Toy with slow movement recovery. 5,462,473, Cl. 446-183.000.
- Shelley, Philip: *See—*
  - Shearer, John R.; and Shelley, Philip, 5,462,563, Cl. 623-18.000.
- Shelstad, Scott A.: *See—*
  - Morehouse, James H.; Furay, David M.; Blagaila, John; Dion, F. Eugene; Shelstad, Scott A.; and Woods, Jimmy L., 5,463,507, Cl. 360-97.020.
- Shen, T. Y.: *See—*
  - Biftu, Tesfaye; Cai, Xiong; Hussion, Sajjet; Grewal, Gurmit; and Shen, T. Y., 5,463,083, Cl. 549-71.000.
- Shenoy, Ravindra V.: *See—*
  - Datta, Madhav; and Shenoy, Ravindra V., 5,462,638, Cl. 156-656.100.
- Shepherd, Mark R.: *See—*
  - Temple, Stephen; and Shepherd, Mark R., 5,463,414, Cl. 347-68.000.
- Sheppard, Clyde H.; and Lubowitz, Hyman R., to Boeing Company, The. Method of making multidimensional oligomers. 5,463,076, Cl. 548-431.000.
- Sherman, James F., to General Motors Corporation. Engagement control mechanism for a torque transmitting device. 5,462,147, Cl. 192-18.00A.
- Sherman, William G., II: *See—*
  - Benhase, Michael T.; Beardsley, Brent C.; Sherman, William G., II; and Yanes, Adalberto G., 5,463,752, Cl. 395-481.000.
- Shiba, Akira: *See—*
  - Yamada, Isamu; Shiba, Akira; and Iizuka, Miyuki, 5,462,058, Cl. 128-661.080.
- Shibano, Yoshihide; and Saito, Tsutou. Method of oscillating ultrasonic vibrator for ultrasonic cleaning. 5,462,604, Cl. 134-1.000.
- Shibazaki, Osamu; and Ohkubo, Hitoshi, to Konica Corporation. Manufacturing method of a flange for use in a film cartridge. 5,462,710, Cl. 264-297.200.
- Shibuta, Nobuhiro: *See—*
  - Mukai, Hidehito; Sato, Kenichi; and Shibuta, Nobuhiro, 5,462,920, Cl. 505-432.000.
- Shibuya, Yuusaku: *See—*
  - Yashiki, Yuichi; Hondumi, Masahiko; Ohki, Yuzuru; Ito, Takashi; Nakjajima, Fumitaka; Mori, Masakazu; Aoki, Takayoshi; Mizuishi, Harumitsu; and Shibuya, Yuusaku, 5,463,456, Cl. 355-299.000.
- Shida, Masayuki, to Shei Kako Kabushiki Kaisha. Shield plate mounting structure in helmet. 5,461,731, Cl. 2-424.000.
- Shieh, Chia-Hui, to Beckman Instruments, Inc. Coated capillary columns and electrophoretic separation methods for their use. 5,462,646, Cl. 204-180.100.
- Shields, Richard A., Jr.: *See—*
  - Kepley, Walter R., III; Greer, Dana J.; and Shields, Richard A., Jr., 5,463,678, Cl. 379-91.000.
- Shields, Waylon D.: *See—*
  - Meisenburg, Gary L.; Eick, Edward C.; Magee, Phillip D.; Mixon, Charles M.; Weronke, Robert B.; Shields, Waylon D.; Smith, Woody R.; and Pavey, Steven J., 5,462,463, Cl. 440-80.000.
- Shigyo, Naoyuki: *See—*
  - Toriumi, Akira; Shigyo, Naoyuki; Wada, Tetsunori; Tanimoto, Hiroyoshi; Ohuchi, Kazuya; and Yoshimi, Makoto, 5,463,234, Cl. 257-296.000.
- Shigyo, Yoshiharu: *See—*
  - Morioka, Hiroshi; Noguchi, Minori; Ohshima, Yoshimasa; Kembo, Yukio; Nishiyama, Hidetoshi; Matsuoka, Kazuhiko; and Shigyo, Yoshiharu, 5,463,459, Cl. 356-237.000.
- Shih, Neng-Yang; Aslanian, Robert; Lupo, Andrew, Jr.; Piwinski, John J.; Green, Michael J.; and Ganguly, Ashit K., to Schering Corporation. Imidazolyl or imidazoylalkyl substituted with a four or five membered nitrogen containing heterocyclic ring. 5,463,074, Cl. 548-314.700.
- Shih, Shu-Ching: *See—*
  - Hsieh, Jih-Han; Shih, Shu-Ching; Chi, Wei-Kuang; Chu, Yi-Ding; and Lin, Ae-Ning, 5,462,863, Cl. 435-69.300.
- Shihabi, David S.: *See—*
  - Audeh, Costandi A.; Shihabi, David S.; Socha, Richard F.; and Stevenson, Scott A., 5,463,168, Cl. 585-854.000.
- Shiiki, Kazuo: *See—*
  - Otomo, Shigekazu; Kumasaka, Noriyuki; Shiiki, Kazuo; Yamashita, Takeo; Saito, Noritoshi; and Tarutani, Yoshinobu, 5,463,518, Cl. 505-171.000.
- Shiina, Yoshio: *See—*
  - Inaba, Shigeru; Fukuhara, Masaaki; Hirota, Makoto; Yamamoto, Mitsuo; Abe, Jun; Miyata, Hideaki; Sunaga, Takayuki; Ishikawa, Toru; Shiina, Yoshio; Isosu, Toru; and Kanno, Makoto, 5,463,452, Cl. 355-246.000.
- Shimada, Isao: *See—*
  - Masumoto, Yasuhiro; and Shimada, Isao, 5,462,379, Cl. 401-213.000.
- Shimada, Tadahiro; Yuki, Sachiko; and Iizuka, Tomoko, to Shiseido Co., Ltd. Skin cleansing agent. 5,462,691, Cl. 252-174.150.
- Shimada, Tomoyuki; Sasaki, Masaomi; Hashimoto, Mitsuru; and Aruga, Tamotsu, to Ricoh Company, Ltd. Charge transporting materials and electrophotographic photoconductors using the same. 5,462,826, Cl. 430-59.000.
- Shimaoka, Manabu, to Alps Electric Co., Ltd. Switching device. 5,463,198, Cl. 200-531.000.
- Shimizu, Hirohiko: *See—*
  - Suzuki, Yuji; Shimizu, Hirohiko; Suzuki, Hiroyuki; and Tsuji, Kiyoaki, 5,463,509, Cl. 360-99.060.
- Shimizu, Hiroyuki: *See—*
  - Sano, Akira; Shiraishi, Takeichi; Suzuki, Kunihiro; Okamoto, Mitsuo; Usui, Katumi; Shimizu, Hiroyuki; and Matsuura, Kazuo, 5,463,001, Cl. 526-124.500.
- Shimizu, Izuru; Yoshida, Tetsuo; Iguchi, Masao; and Fukanuma, Tetsuhiko, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Scroll type compressor equipped with mechanism for receiving reaction force of compressed gas. 5,462,418, Cl. 418-55.300.
- Shimizu, Kazuharu: *See—*
  - Kobayashi, Masanobu; Itoh, Motoi; Matsuhisa, Yoji; and Shimizu, Kazuharu, 5,462,799, Cl. 428-364.000.
- Shimizu, Makoto: *See—*
  - Esaki, Toshiro; Suzuki, Mituru; Sato, Susumu; Takahashi, Kohichi; and Shimizu, Makoto, 5,462,240, Cl. 242-348.100.
- Shimizu, Shigeru, to Sony Corporation. Pilot signal eliminating circuit. 5,463,474, Cl. 358-310.000.
- Shimizu, Toru: *See—*
  - Iwata, Shunichi; and Shimizu, Toru, 5,463,747, Cl. 395-375.000.
- Shimizu, Tsutomu: *See—*
  - Minami, Takanori; Shiraishi, Noriaki; Shimizu, Tsutomu; Takamuku, Kenji; Tsushio, Yoshinori; Mizushima, Yoshio; Yoshimoto, Kazuyuki; and Kadokura, Masaki, 5,462,021, Cl. 123-3.000.
- Shimoji, Noriyuki, to Rohm Co., Ltd. Semiconductor memory device with floating gate and method for driving the same. 5,463,579, Cl. 365-185.010.
- Shimura, Hidetoshi: *See—*
  - Taniai, Takayoshi; Satoh, Hajime; Shimura, Hidetoshi; and Saitoh, Tadashi, 5,463,740, Cl. 395-299.000.
- Shin-Etsu Chemical Co., Ltd.: *See—*
  - Fukumoto, Takehiko; Iwai, Daisuke; Okano, Shigeo; Suzuki, Hiroshi; and Oshima, Mitsuyoshi, 5,463,149, Cl. 570-135.000.
  - Tanifuji, Yoichi; and Yamamoto, Yasuhiro, 5,462,998, Cl. 526-67.000.
- Shin-Etsu Handotai Co., Ltd.: *See—*
  - Takano, Kiyotaka; Fusegawa, Izumi; Yamagishi, Hirotoshi; Mizuishi, Koji; and Ogino, Katsuhiko, 5,462,010, Cl. 117-14.000.
- Shinbo, Toshihiro: *See—*
  - Shirai, Kazushi; Shinbo, Toshihiro; Takeda, Norio; and Arii, Mitsuzo, 5,463,316, Cl. 324-244.100.
- Shinbo, Yutaka; Kajimoto, Takeshi; Kobayashi, Mitsuteru; and Sato, Katsuyuki, to Hitachi, Ltd. Electronic circuit system unit with wiring substrate. 5,463,249, Cl. 257-690.000.
- Shindledecker, Walter. Fishing lure with directionally controllable reverse swimming feature. 5,461,819, Cl. 43-42.130.

Shinjo, Teruya; Yamamoto, Hidefumi; Anno, Toshihiko; and Takada, Toshio, to Ube Industries, Ltd.; Nippon Steel Corporation; TDK Corporation; Tosoh Corporation; Japan Energy Corporation; NEC Corporation; Matsushita Electric Industrial Co., Ltd.; and Seisan. Magnetoresistance effect element. 5,462,795, Cl. 428-332.000.

Shinko Electric Industries Co., Ltd.: *See*—
  Onuma, Yoshio; and Hamasaki, Katsuyoshi, 5,462,762, Cl. 427-63.000.

Shinno, Hidenori: *See*—
  Sato, Chuichi; Tsukamoto, Shigemi; and Shinno, Hidenori, 5,462,361, Cl. 384-9.000.

Shinogle, Ronald D., to Caterpillar Inc. Encapsulated adjustable rate shaping device for a fuel injection system. 5,462,030, Cl. 123-457.000.

Shinohara, Jun: *See*—
  Nishida, Junichi; Araki, Morio; Arakawa, Takeharu; Ishida, Tessho; Ayukai, Yasushiro; Baba, Toshiharu; Sakaguchi, Masahiko; Nobe, Kenichi; Kaneko, Michihiro; and Shinohara, Jun, 5,463,605, Cl. 369-58.000.

Shinohara, Satoru: *See*—
  Ito, Kengo; Mizumachi, Motohiro; Fujiwara, Yoshio; and Shinohara, Satoru, 5,462,910, Cl. 503-227.000.

Shinonaga, Hideo; and Sogabe, Satoru, to Sumitomo Chemical Company, Limited. Polypropylene resin composition having an improved compatibility with paint-coatings and a paint-coated article thereof. 5,462,987, Cl. 524-451.000.

Shinozaki, Masatsugu: *See*—
  Umemura, Masaya; Ogura, Toshihiko; Osaka, Hideki; and Shinozaki, Masatsugu, 5,462,442, Cl. 439-69.000.

Shintani, Dai; Okada, Hiroyuki; Hoda, Takeo; Izumi, Shuji; Mukai, Hiromu; Hatamori, Osamu; and Tsuji, Sadafusa, to Minolta Camera Kabushiki Kaisha. Remote controllable camera system. 5,463,436, Cl. 354-81.000.

Shiokawa, Yoshihiro; Takefumi, Tadayoshi; Matsumoto, Shunichi; and Sato, Yoshifumi, to Mitsubishi Gas Chemical Company, Inc. Process for the production of esters. 5,463,095, Cl. 554-130.000.

Shiomi, Yutaka: *See*—
  Saito, Noriaki; Morimoto, Takashi; Takebe, Kazuo; Shiomi, Yutaka; Naitoh, Shigeki; and Kanagawa, Shuichi, 5,462,997, Cl. 525-507.000.

Shionogi & Co., Ltd.: *See*—
  Haga, Nobuhiro; Inagaki, Masanao; Matsumoto, Saichi; and Kamata, Susumu, 5,463,052, Cl. 544-2.000.
  Konoike, Toshiro; Araki, Yoshitaka; Hayashi, Tetsuyoshi; Sakurai, Kensuke; and Tozyo, Takehiko, 5,463,107, Cl. 560-43.000.
  Yamamori, Teruo; Harada, Hiroshi; Sakai, Katsunori; Iwaki, Kazumi; and Matsunaga, Kazuki, 5,462,936, Cl. 514-211.000.

Shioura, Kozo: *See*—
  Taguchi, Hideo; Shioura, Kozo; and Sugeno, Miwa, 5,462,571, Cl. 65-437.000.

Shipe, Joanne E.: *See*—
  Korsunsky, Iosif; Harlan, Tod M.; and Shipe, Joanne E., 5,462,444, Cl. 439-108.000.

Shirai, Kazushi; Shinbo, Toshihiro; Takeda, Norio; and Arii, Mitsuzo, to Mitsubishi Gas Chemical Co., Ltd. Magnetooptic sensor head. 5,463,316, Cl. 324-244.100.

Shiraishi, Hiroyuki: *See*—
  Miyoshi, Yoshihiro; Shiraishi, Hiroyuki; Kawai, Kiyoshi; and Koga, Hideaki, 5,463,000, Cl. 526-119.000.

Shiraishi, Noriaki: *See*—
  Minami, Takanori; Shiraishi, Noriaki; Shimizu, Tsutomu; Takamuku, Kenji; Tsushio, Yoshinori; Mizushima, Yoshio; Yoshimoto, Kazuyuki; and Kadokura, Masaki, 5,462,021, Cl. 123-3.000.

Shiraishi, Sadao: *See*—
  Kamiyama, Shiro; Kosugi, Masanori; Kurata, Masahiro; Shiraishi, Sadao; and Sasaki, Nobuyoshi, 5,462,634, Cl. 216-85.000.

Shiraishi, Takeichi: *See*—
  Sano, Akira; Shiraishi, Takeichi; Suzuki, Kunihiro; Okamoto, Mitsuo; Usui, Katumi; Shimizu, Hiroyuki; and Matsuura, Kazuo, 5,463,001, Cl. 526-124.500.

Shiseido Co., Ltd.: *See*—
  Shimada, Tadahiro; Yuki, Sachiko; and Iizuka, Tomoko, 5,462,691, Cl. 252-174.150.

Shoesangyo Corporation: *See*—
  Iji, Masahiro; Yoda, Masami; Suzuki, Shin; Ishizuka, Kaoru; Kubo, Sotoo; Yamaki, Isao; and Hashimoto, Toshikuni, 5,462,672, Cl. 210-727.000.

Shoji, Toru: *See*—
  Betta, Ralph D.; Shoji, Toru; and Tanaka, Seiichiro, 5,461,864, Cl. 60-723.000.

Showa Highpolymer Co., Ltd.: *See*—
  Doi, Yukio; Zhang, Wei-Zhong; Ishitani, Koichi; and Kinugasa, Masayoshi, 5,462,988, Cl. 524-501.000.

Showalter, Howard D. H.: *See*—
  French, James C.; Edmunds, Colin R.; McDonnell, Peter; and Showalter, Howard D. H., 5,463,035, Cl. 536-55.300.

Shuin, Toshiya: *See*—
  Konishi, Toshio; Horibe, Toshihiko; Yashiro, Toru; Watanabe, Kouji; and Shuin, Toshiya, 5,462,806, Cl. 428-451.000.

Shultz, Duane E.: *See*—
  Gray, John C.; and Shultz, Duane E., 5,461,897, Cl. 72-213.000.

Shute, Richard E.: *See*—
  Brown, George R.; and Shute, Richard E., 5,463,011, Cl. 528-44.000.

Sichelschmidt, Dieter: *See*—
  Tillmann, Horst; Jentsch, Dietrich; Hering, Thomas; Warschewitz, Thomas; Sichelschmidt, Dieter; and Winkler, Bernd, 5,461,754, Cl. 16-82.000.

Siefken, Allen J., to Rexroth Corporation, The. Noninvasive ultrasonic proximity detector for a fluid actuated cylinder. 5,463,596, Cl. 367-98.000.

Siegenthaler, Karl J., to Bridgestone Corporation. Toroidal carcass for road vehicle tires. 5,462,104, Cl. 152-563.000.

Siekhaus, Wigbert J.: *See*—
  Tench, Robert J.; Siekhaus, Wigbert J.; Balooch, Mehdi; Balhorn, Rodney L.; and Allen, Michael J., 5,461,907, Cl. 73-105.000.

Siemens Aktiengesellschaft: *See*—
  Krebs, Stefan; Kettl, Ludwig; and Cianciara, Wojciech, 5,462,040, Cl. 123-688.000.
  Kurbjuhn, Klaus; and Mueller, Heinz-Dieter, 5,462,443, Cl. 439-78.000.
  Sörgel, Günter, 5,461,894, Cl. 72-8.000.
  Zimmer, Herbert, 5,463,259, Cl. 307-106.000.

Siemens-Albis AG: *See*—
  Bidese, Werner; Fritschi, Hans-Rudolf; and Grau, Alfred, 5,463,680, Cl. 379-165.000.

Siemens Automotive L.P.: *See*—
  Hall, Bryan C., 5,462,231, Cl. 239-585.400.

Siemens Elema AB: *See*—
  Eriksson, Sture; and Edstroem, Rolf, 5,461,911, Cl. 73-201.000.

Siemens Energy & Automation, Inc.: *See*—
  Donnerstag, Leonard, deceased; and Donnerstag, Rory, executor, 5,463,533, Cl. 361-825.000.

Siemens Medical Systems, Inc.: *See*—
  Hawman, Peggy C.; Qian, Jianzhong; and Treffert, Jon D., 5,462,056, Cl. 128-659.000.

Siemens Telecomunicazioni S.p.A.: *See*—
  Buoli, Carlo; Mora, Giovanni; and Turillo, Tommaso, 5,463,360, Cl. 331-96.000.

Sigety, Stephen, Jr.: *See*—
  Froling, Thomas H.; Nistor, Thomas A.; and Sigety, Stephen, Jr., 5,461,938, Cl. 74-502.400.

Silha, Edward J.: *See*—
  Albaugh, Virgil A.; Muhich, John S.; Silha, Edward J.; and Vanover, Michael T., 5,463,739, Cl. 395-826.000.

Silicon Video Corp.: *See*—
  Geis, Michael W.; Macaulay, John M.; and Twichell, Jonathan C., 5,463,271, Cl. 313-346.00R.
  Macaulay, John M.; Searson, Peter C.; Duboc, Robert M., Jr.; and Spindt, Christopher J., 5,462,467, Cl. 445-50.000.

Simmons, Richard L.; and Bertram, Michael J., to Microelectronics and Computer Technology Corporation. High force compression flip chip bonding system. 5,462,217, Cl. 228-180.220.

Simon, Ethan S.: *See*—
  Paik, Yi H.; Simon, Ethan S.; and Swift, Graham, 5,463,017, Cl. 528-361.000.

Simon, Günter: *See*—
  Wolter, Karin; Müller, Walter; Simon, Günter; Nalbach, Christa; and Hoffmann, Hans-Rainer, 5,462,746, Cl. 424-449.000.

Simonds, Edward L., to Thermal Dynamics, Inc. Transducer for converting linear energy to rotational energy. 5,461,863, Cl. 60-676.000.

Simonetti, Enrico: *See*—
  Misiano, Carlo; Simonetti, Enrico; and Staffetti, Francesco, 5,462,779, Cl. 428-34.700.

Simonetti, Enrlco: *See*—
  Misiano, Carlo; and Simonetti, Enrlco, 5,462,602, Cl. 118-718.000.

Simpson, John B.; and Anderson, Scott C., to Technology Development Center. Adjustable treatment chamber catheter. 5,462,529, Cl. 604-101.000.

Simpson, Miles S.; Kimura, Scott A.; and Gibson, Steven L., to Auravision Corporation. Data processing technique for limiting the bandwidth of data to be stored in a buffer. 5,463,422, Cl. 348-390.000.

Simpson, Roger T., to Borg-Warner Automotive, Inc. Dual blade chain tensioner with damping. 5,462,493, Cl. 474-111.000.

Singer, Phil M.: *See*—
  Trulaske, Frank R.; and Singer, Phil M., 5,462,504, Cl. 482-7.000.

Singer, Stephen P.: *See*—
  Merkel, Paul B.; and Singer, Stephen P., 5,462,848, Cl. 430-546.000.

Singers, Robert R.: *See*—
  Pascucci, Gregory A.; Rasmussen, David E.; Decious, Gaylon M.; Garbe, James R.; Hyzer, Susan M.; Woest, Karen L.; Vairavan, Vairavan; Koch, David L.; Gottschalk, Donald A.; Jr.; Burkhardt, Dennis E.; Standish, Darrell E.; Madaus, Paul W.; Spacek, Dan J.;, 5,463,735, Cl. 395-200.100.

Singh, Jai P.: *See*—
  Cullinan, George J.; Singh, Jai P.; and Wood, Dan L., 5,462,937, Cl. 514-212.000.

Singleton, David M.; and Murray, Brendan D., to Shell Oil Company. Process for the direct hydrogenation of wax esters. 5,463,143, Cl. 568-864.000.

Singleton, John A.; and Stikeleather, Larry F., to United States of America, Agriculture. High performance liquid chromatography injection system for the simultaneous concentration and analysis of trace components. 5,462,660, Cl. 210-198.200.

Sinh, Nguyen X.: *See*—
  Yee, Loren W.; and Sinh, Nguyen X., 5,463,332, Cl. 326-126.000.

Skalka, Ivan, to Textilma AG. Piezoelectric devices for yarn control apparatus in a textile machine. 5,462,097, Cl. 139-455.000.

Skarda, Louis J.; Miller, Stanley H.; and McCullough, Timothy L., to Minnesota Mining and Manufacturing Company. Power conservation device for a peripheral interface module. 5,463,261, Cl. 307-131.000.
Skotheim, Terje A., to Moltech Corporation. High capacity cathodes for secondary cells. 5,462,566, Cl. 29-623.100.
Skotnicki, Jerauld S.; and Palmer, Yvette L., to American Home Products Corporation. Rapamycin amidino carbamates. 5,463,048, Cl. 540-456.000.
SKW Trostberg Aktiengesellschaft: *See—*
  Hintermaier, Helmut; Maier, Ursula; and Weiss, Stefan, 5,463,055, Cl. 544-299.000.
Sky Aluminium Co., Ltd.: *See—*
  Kamiyama, Shiro; Kosugi, Masanori; Kurata, Masahiro; Shiraishi, Sadao; and Sasaki, Nobuyoshi, 5,462,634, Cl. 216-85.000.
Slaugh, Lynn H.; Powell, Joseph B.; Forschner, Thomas C.; Semple, Thomas C.; and Weider, Paul R., to Shell Oil Company. Process for preparing 1,3-propanediol. 5,463,146, Cl. 568-862.000.
Slaugh, Lynn H.: *See—*
  Powell, Joseph B.; Slaugh, Lynn H.; Forschner, Thomas C.; Thomason, Terry B.; Semple, Thomas C.; Weider, Paul R.; and Arhancet, Juan P., 5,463,144, Cl. 568-867.000.
  Powell, Joseph B.; Slaugh, Lynn H.; Forschner, Thomas C.; Semple, Thomas C.; and Weider, Paul R., 5,463,145, Cl. 568-867.000.
Slaughter, Gibbs M., Jr. Method for resurfacing fiberglass boat hulls. 5,462,702, Cl. 264-36.000.
Slavicek, James M.; and Mercer, Melissa J., to United States of America, Agriculture. Method of protecting plants from insects by applying gypsy moth virus with enhanced polyhedra production stability. 5,462,732, Cl. 424-93.200.
Sleeter, Ronald T.: *See—*
  Matlock, Mark G.; Sleeter, Ronald T.; and Jebe, Tod A., 5,463,321, Cl. 324-439.000.
Slim, David R.; Mohundro, Edgar L.; and Mayo, Stephen M., to Exxon Chemical Patents Inc. Arsine and phosphines as acetylene converter moderators. 5,463,154, Cl. 585-261.000.
Small, Edith M.; Prisby, Michael V.; and Thomason, Terry D., to Illinois Tool Works Inc. Molding an electrical element within a premold element and an overmold element to provide a one-piece component. 5,462,622, Cl. 156-245.000.
Smart, Melinda K.: *See—*
  Enscore, David J.; Campbell, Patricia S.; Osborne, James L.; Smart, Melinda K.; and Yum, Su I., 5,462,745, Cl. 424-448.000.
SMC Kabushiki Kaisha: *See—*
  Fukano, Yoshihiro; Makado, Shoichi; and Arakawa, Takeshi, 5,462,087, Cl. 137-884.000.
Smith, Dale E.; and Chase, Edward W., III, to United Technologies Corporation. Damper and seal for propeller quill shaft. 5,462,410, Cl. 416-165.000.
Smith, Donald A.: *See—*
  Best, Jim E.; and Smith, Donald A., 5,462,129, Cl. 175-67.000.
Smith, Donald K.; Haddix, Stephen J.; and Blomquist, Randall J., to Guaranteed Baffle Co., Inc.; and Norpac GSE. Apparatus and method for shredding insulation. 5,462,238, Cl. 241-243.000.
Smith, Elizabeth: *See—*
  Wiggins, Ralphe; Smith, Elizabeth; and Shanbaum, Suzanne P., 5,463,727, Cl. 395-156.000.
Smith, Gene A. Transportable foldable building and method of erecting a transportable foldable building. 5,461,832, Cl. 52-69.000.
Smith, Graham J.: *See—*
  McTaggart, Fergus; Pemberton, Denis; and Smith, Graham J., 5,462,730, Cl. 424-78.350.
Smith, Jay L.; Trubey, Bradley S.; and Walker, Anthony D., to International Business Machines Corporation. Dual ring fault isolation. 5,463,634, Cl. 371-20.600.
Smith, Jeffery S.: *See—*
  Punola, David C.; Basta, William C.; and Smith, Jeffery S., 5,462,013, Cl. 118-719.000.
Smith, Lawrence E.: *See—*
  George, John B.; and Smith, Lawrence E., 5,463,288, Cl. 315-382.000.
Smith, Scott J.; and Lind, Eric J., to Nalco Chemical Company. Superabsorbent polymer having improved absorption rate and absorption under pressure. 5,462,972, Cl. 521-53.000.
Smith, Steven L.: *See—*
  Barney, Ward W.; and Smith, Steven L., 5,462,526, Cl. 604-85.000.
Smith, Wayne W.: *See—*
  Moore, Earl H.; Frick, Thomas J.; and Smith, Wayne W., 5,461,878, Cl. 62-255.000.
Smith, Woody R.: *See—*
  Meisenburg, Gary L.; Eick, Edward C.; Magee, Phillip D.; Mixon, Charles M.; Weronke, Robert B.; Shields, Waylon D.; Smith, Woody R.; and Pavey, Steven J., 5,462,463, Cl. 440-80.000.
SmithKline Beecham Corporation: *See—*
  Jonak, Zdenka L.; Debouck, Christine; Clark, Robert; and Trulli, Stephen, 5,462,872, Cl. 435-240.200.
Snap-on Incorporated: *See—*
  Iwinski, Dean J., 5,461,950, Cl. 81-61.000.
Sninsky, Charles A.: *See—*
  Bergeron, Raymond J., Jr.; and Sninsky, Charles A., 5,462,970, Cl. 514-654.000.
Snyder, David T. Snoring relief device. 5,462,066, Cl. 128-848.000.
Snyder, Timothy S.; Rosfjord, Thomas J.; McVey, John B.; Hu, Aaron S.; and Schlein, Barry C., to United Technologies Corporation. Tangential entry fuel nozzle. 5,461,865, Cl. 60-737.000.
Soberon, Peter A.: *See—*
  Minick, Steven E.; Lawless, Michael W.; Soberon, Peter A.; Kaul, Ashok; and Hermann, Robert A., 5,462,256, Cl. 251-331.000.
Sobol, Robert E.; Webb, Steven L.; and Boyd, David W., to Hewlett-Packard Company. Adapter for scanning transparencies with a reflective document scanner. 5,463,217, Cl. 250-234.000.
Socha, Richard F.: *See—*
  Audeh, Costandi A.; Shihabi, David S.; Socha, Richard F.; and Stevenson, Scott A., 5,463,168, Cl. 585-854.000.
Societe Anonyme dite: Eurocopter France: *See—*
  Jalaguier, Jean P.; and Krysinski, Tomasz, 5,461,796, Cl. 33-233.000.
Societe Anonyme Dite: European Gas Turbines SA: *See—*
  Poux, Jacques; Gandia, Liberto; and Rouget, Frédéric, 5,462,088, Cl. 138-39.000.
Sofia, Michael J.: *See—*
  Baker, S. Richard; Dillard, Robert D.; Floreancig, Paul E.; Sawyer, J. Scott; and Sofia, Michael J., 5,462,954, Cl. 514-381.000.
Sofia, Robert D., to Carter-Wallace Inc. Methods for the prevention and control of cellular damage resulting from coronary artery occlusion-reperfusion. 5,462,966, Cl. 514-483.000.
Sogabe, Satoru: *See—*
  Shinonaga, Hideo; and Sogabe, Satoru, 5,462,987, Cl. 524-451.000.
SOL-CAP, Inc.: *See—*
  Young, Trent P.; Young, Trent P., Jr.; Ingram, Paul R.; and Ingram, Steven J., 5,463,163, Cl. 588-249.000.
Solaronics: *See—*
  Ahmady, Farshid, 5,462,431, Cl. 431-43.000.
Solecki, Dennis. Adjustable arrow guide. 5,462,041, Cl. 124-44.500.
Soll, Richard M.: *See—*
  Agrafiotis, Dimitris K.; Bone, Roger F.; Salemme, Francis R.; and Soll, Richard M., 5,463,564, Cl. 364-496.000.
Sol Na, Han. Knife handle with sharpening guide indentations. 5,461,785, Cl. 30-138.000.
Solvay Interox Limited: *See—*
  Sankey, John P.; Sanderson, William; and Horne, Graham R., 5,463,112, Cl. 562-2.000.
Someya, Ryuko: *See—*
  Maeda, Akira; Sugimura, Yoshikane; Funabashi, Motohisa; Nakano, Toshihiko; Someya, Ryuko; and Kosaka, Michitaka, 5,463,718, Cl. 395-23.000.
Sommer, Norbert: *See—*
  Schmale, Gerhard; Sommer, Norbert; and Zynda, Martin, 5,462,339, Cl. 297-452.550.
Sommer, Wolfgang: *See—*
  Damm, Klaus; Mages, Walter J.; and Sommer, Wolfgang, 5,462,395, Cl. 411-107.000.
Sonderegger, Hans C.: *See—*
  Calderara, Reto; Jahreiss, Lothar; Sonderegger, Hans C.; and Caprez, Markus, 5,461,924, Cl. 73-786.000.
Sonesson, Clas A.: *See—*
  Svensson, Kjell A. I.; Wikstrom, Hakan V.; Carlsson, Per A. E.; Boije, Anna M. P.; Waters, R. Nicholas; Sonesson, Clas A.; Stjernlof, Nils P.; Andersson, Bengt R.; and Hansson, Lars O., 5,462,947, Cl. 514-317.000.
Song, Moon J., to Samsung Electronics Co., Ltd. First grid muting circuit. 5,463,289, Cl. 315-384.000.
Sonnenberg, Sven: *See—*
  Morse, Theodore H.; Rimai, Donald S.; Potucek, Martin; and Sonnenberg, Sven, 5,463,449, Cl. 355-203.000.
Sonoco Products Company: *See—*
  Adams, Samuel F.; and Bolz, Hans-Peter, 5,461,889, Cl. 68-189.000.
SONOR Johs. Link GmbH: *See—*
  Sassmannshausen, Werner; Menzel, Karl-Heinz; Sassmannshausen, Werner; Schreiber, Stefan; Kleindienst, Anke; and Günther, Hubert, 5,461,959, Cl. 84-421.000.
Sony Corporation: *See—*
  Deguchi, Hiroaki; Yamashita, Masahiro; and Masuda, Yukihiro, 5,463,421, Cl. 348-296.000.
  Imura, Shigeru, 5,463,210, Cl. 235-441.000.
  Ise, Koichi, 5,463,496, Cl. 359-497.000.
  Ito, Kengo; Mizumachi, Motohiro; Fujiwara, Yoshio; and Shinohara, Satoru, 5,462,910, Cl. 503-227.000.
  Kohno, Nobuo, 5,462,374, Cl. 400-625.000.
  Nakata, Tetsuro, 5,463,570, Cl. 364-745.000.
  Oka, Nobuyuki; Sato, Toshio; and Mizuki, Masayuki, 5,463,602, Cl. 369-44.290.
  Shimizu, Shigeru, 5,463,474, Cl. 358-310.000.
  Suzuki, Yuji; Shimizu, Hirohiko; Suzuki, Hiroyuki; and Tsuji, Kiyoaki, 5,463,509, Cl. 360-99.060.
  Tachi, Katsuichi, 5,463,425, Cl. 348-515.000.
  Yanagisawa, Tetsu, 5,463,601, Cl. 364-32.000.
Sony Electronics Inc.: *See—*
  Trueblood, John W., 5,463,702, Cl. 382-239.000.
Sony United Kingdom Limited: *See—*
  Wilkinson, James H., 5,463,699, Cl. 382-246.000.
Sorensen, Lars S., to Motorola. Data network interface. 5,463,628, Cl. 370-110.100.

Sörgel, Günter, to Siemens Aktiengesellschaft. Control system for a hot and/or cold rolling process. 5,461,894, Cl. 72-8.000.

Sørheim, Ole Johan; Vik, Kai Magne; and Auran, Lars, to Norsk Hydro a.s. Sealing device for an extruder. 5,461,899, Cl. 72-272.000.

Sorola, Bret S. Swivel construction. 5,461,820, Cl. 43-43.100.

Sorriero, Louis J.: *See—*
  Tyagi, Dinesh; and Sorriero, Louis J., 5,462,829, Cl. 430-109.000.

Sotoyanagi, Osamu; Okami, Yoshinori; and Takahashi, Naoya, to Hitachi, Ltd. Image data filing system comprising of an optical disk library and a disk array. 5,463,771, Cl. 395-600.000.

Soundararajan, Nachimuthu: *See—*
  Godfrey, Jollie D., Jr.; Mueller, Richard H.; Sedergran, Thomas C.; and Soundararajan, Nachimuthu. 5,463,059, Cl. 546-21.000.

Sounik, James R.; Wilkison, William W., III; Russ, Keith M.; and Massarelli, Lynn, to Hoechst Celanese Corporation. Process for preparing acetoxystyrene. 5,463,108, Cl. 560-130.000.

Sounik, James R.; Wilkison, William W., III; and Russ, Keith M., to Hoechst Clanese Corporation. Process for preparing poly(4-hydroxystyrene). 5,463,141, Cl. 568-763.000.

Southern Xercise, Inc.: *See—*
  Nichols, Raymond L., Sr.; and Nichols, Raymond L., II, 5,462,507, Cl. 482-104.000.

Southwell, Michael J.: *See—*
  Ransom, Keith C.; and Southwell, Michael J., 5,463,194, Cl. 181-240.000.

Southwest Research Institute: *See—*
  Young, David T.; Marshall, Jill A.; Schweikert, Emile A.; and Park, Melvin A., 5,463,220, Cl. 250-288.000.

Spacek, Dan J.: *See—*
  Pascucci, Gregory A.; Rasmussen, David E.; Decious, Gaylon M.; Garbe, James R.; Hyzer, Susan M.; Woest, Karen L.; Vairavan, Vairavan; Koch, David L.; Gottschalk, Donald A., Jr.; Burkhardt, Dennis E.; Standish, Darrell E.; Madaus, Paul W.; Spacek, Dan J.;, 5,463,735, Cl. 395-200.100.

SpaceLabs Medical, Inc.: *See—*
  Brooks, James R., 5,463,346, Cl. 327-553.000.

Spada, Valter; and Tosi, Giuseppe, to Sasib S.p.A. Device for feeding wrapper sheets, especially for use in cigarette packing machines. 5,461,841, Cl. 53-234.000.

Span, Francis J.: *See—*
  Jordan, Hermann; Krammer, Erich; Rogatschnig, Johann T.; Den Ouden, Petronella H.; and Span, Francis J., 5,462,557, Cl. 606-133.000.

Span Tech Corporation: *See—*
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Spande, Thomas F.: *See—*
  Daly, John W.; Spande, Thomas F.; and Garraffo, Hugo M., 5,462,956, Cl. 514-397.000.

Spector, Donald. Variable weight playball. 5,462,273, Cl. 273-58.00H.

Spectra-Physics Scanning Systems, Inc.: *See—*
  Arends, Thomas C.; and Elliott, Randy D., 5,463,211, Cl. 235-462.000.

Speier, Gary J.: *See—*
  Dolle, Roland E.; Graybill, Todd L.; Speier, Gary J.; Prouty, Catherine P.; and Schmidt, Stanley J., 5,462,939, Cl. 514-231.500.

Spencer, Kevin C.; Schvester, Pascal; and Boisrobert, Christine E., to American Air Liquide, Chicago Research Center. Method for improving enzyme activities with noble gases. 5,462,861, Cl. 435-41.000.

Spindler, Felix: *See—*
  Togni, Antonio; Spindler, Felix; Zanetti, Nadia; and Tijani, Amina, 5,463,097, Cl. 556-14.000.

Spindt, Christopher J.: *See—*
  Macaulay, John M.; Searson, Peter C.; Duboc, Robert M., Jr.; and Spindt, Christopher J., 5,462,467, Cl. 445-50.000.

Spinner, Charles R.; and Liou, Fu-Tai, to SGS-Thomson Microelectronics, Inc. Method for fabricating a polycrystalline silicon resistive load element in an integrated circuit. 5,462,894, Cl. 437-195.000.

Spira, Joel S.: *See—*
  D'Aleo, Michael J.; Ference, Jonathan H.; Hakkarainen, Simo P.; Spira, Joel S.; and Tucker, Darryl W., 5,463,286, Cl. 315-295.000.

Springer, Wolfgang; Rast, Hans G.; Löbberding, Antonius; and Kanne, Reinhard, to Bayer Aktiengesellschaft. Method for the detection and quantitative determination of nitrosomonas strains in wastewaters or soils. 5,462,855, Cl. 435-6.000.

Springsteen, Arthur W., to Labsphere, Inc. Method of forming diffusely reflecting sintered fluorinated long-chain addition polymers doped with pigments for color standard use. 5,462,705, Cl. 264-122.000.

Sprowl, Frank L.: *See—*
  Gregory, James L.; Burzynski, Dennis J.; Rote, Bruce J.; and Sprowl, Frank L., 5,462,187, Cl. 215-350.000.

Square D Company: *See—*
  Calder, Douglas W.; and Bizley, Arthur J., 5,463,333, Cl. 327-78.000.
  Calder, Douglas W.; and Bizley, Arthur J., 5,463,354, Cl. 331-65.000.
  Puri, Jeewan, 5,461,772, Cl. 29-605.000.

Sreedhara, Ramadevi: *See—*
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Sridhar, Manickam R.: *See—*
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Sridhar, Srinivasan, to Huels Aktiengesellschaft. Process for the removal of water from acrylic acid. 5,463,121, Cl. 562-600.000.

Sriram, Kotikalapudi, to AT&T IPM Corp. Bandwidth allocation, transmission scheduling, and congestion avoidance in broadband asynchronous transfer mode networks. 5,463,620, Cl. 370-60.000.

Srisathapat, Chad; and Yates, Paul A., to MiniMed, Inc., a Delaware corporation. Flow sensor for an infusion pump. 5,462,525, Cl. 604-67.000.

Stac Electronics, Inc.: *See—*
  Whiting, Douglas L.; George, Glen A.; and Ivey, Glen E., 5,463,390, Cl. 341-51.000.

Stack, Jr., Stanley: *See—*
  McKillip, John J., 5,462,488, Cl. 462-26.000.

Staffetti, Francesco: *See—*
  Misiano, Carlo; Simonetti, Enrico; and Staffetti, Francesco, 5,462,779, Cl. 428-34.700.

Stahley, Robert E.; Lund, Mark T.; and Collias, Dimitris I., to Procter & Gamble Company, The. Two-phase dispensing systems utilizing bellows pumps. 5,462,208, Cl. 222-207.000.

Standard Car Truck Company: *See—*
  Sarnicki, John T.; and Berg, Thomas R., 5,461,986, Cl. 105-165.000.

Standard Register Company, The: *See—*
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Standish, Darrell E.: *See—*
  Pascucci, Gregory A.; Rasmussen, David E.; Decious, Gaylon M.; Garbe, James R.; Hyzer, Susan M.; Woest, Karen L.; Vairavan, Vairavan; Koch, David L.; Gottschalk, Donald A., Jr.; Burkhardt, Dennis E.; Standish, Darrell E.; Madaus, Paul W.; Spacek, Dan J.;, 5,463,735, Cl. 395-200.100.

Staniec, Robert, to Harvey Universal, Inc. Cutting oil treatment apparatus. 5,462,656, Cl. 210-150.000.

Stansbury, Jeffrey W., to United States of America, Commerce. Monomers for double ring-opening polymerization with expansion. 5,463,008, Cl. 526-268.000.

Stark, James K.: *See—*
  Pascucci, Gregory A.; Rasmussen, David E.; Decious, Gaylon M.; Garbe, James R.; Hyzer, Susan M.; Woest, Karen L.; Vairavan, Vairavan; Koch, David L.; Gottschalk, Donald A., Jr.; Burkhardt, Dennis E.; Standish, Darrell E.; Madaus, Paul W.; Spacek, Dan J.;, 5,463,735, Cl. 395-200.100.

Stark, Walter; and Ruprecht, Robert, to Kernforschungszentrum Karlsruhe GmbH. Etching solution. 5,462,640, Cl. 216-103.000.

Staszak, Jeffery G. Hand warming muff and holding apparatus. 5,461,728, Cl. 2-247.000.

State of New York, Research Foundation of the: *See—*
  Subramanian, Gopal; and Schneider, Richard F., 5,463,030, Cl. 534-16.000.

Staten, Kenneth E., to Rogers Athletic Company. Football training sled. 5,462,272, Cl. 273-55.00R.

Staver, Daniel A.; and McGrath, Donald T., to General Electric Company. Decimation filter using a zero-fill circuit for providing a selectable decimation ratio. 5,463,569, Cl. 364-724.100.

Steffen, Klaus-Dieter, to Hüls Aktiengesellschaft. Process for preparing dialkyl 2-haloethyl malonates. 5,463,111, Cl. 560-192.000.

Stehr, Roger; and Boelsterli, Urs, to Maag Pump Systems AG. Gear pump. 5,462,420, Cl. 418-83.000.

Steimle, Andre: *See—*
  Desrosiers, Bernard; Louis, Didier; Pinchon, Didier; and Steimle, Andre, 5,463,574, Cl. 364-748.000.

Stein, Arthur C.; and Reynolds, John J., to General Motors Corporation. Method and mold for forming a shaped laminate. 5,462,421, Cl. 425-4.00R.

Stein, Michael A.: *See—*
  Van Wagener, Raymond H.; Freimuth, Lothar; and Stein, Michael A., 5,463,522, Cl. 361-103.000.

Steinhorn, Daniel, to AT&T Corp. Node failure restoration tool. 5,463,615, Cl. 370-16.000.

Steininger, Helmut: *See—*
  Keller, Harald; Jaeger, Ulrich; Steininger, Helmut; Kopke, Helmut; Schomann, Klaus D.; and Schildberg, Hans-Peter, 5,462,810, Cl. 428-694.00T.

Stemerick, David M., to Merrell Dow Pharmaceuticals Inc. Farnesyl: protein transferase inhibitors as anticancer agents. 5,463,181, Cl. 514-125.000.

Stendel, Wilhelm: *See—*
  Fischer, Reiner; Bretschneider, Thomas; Krüger, Bernd-Wieland; Erdelen, Christoph; Santel, Hans-Joachim; Lürssen, Klaus; Schmidt, Robert R.; Wachendorff-Neumann, Ulrike; and Stendel, Wilhelm, 5,462,913, Cl. 504-138.000.

StereoGraphics Corporation: *See—*
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Sterling Winthrop Inc.: *See—*
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Stern, Howard; Yonescu, William; Vaiana, Joseph; and Mauro, Alex, to Robotic Vision Systems, Inc. Method for obtaining three-dimensional data from multiple parts or devices in a multi-pocketed tray. 5,463,227, Cl. 250-559.290.

Stern, Leif E., to Asept International AB. Dispenser for dispersing convenient units of two liquid products. 5,462,203, Cl. 222-137.000.

Stevens, Jon A., to Tahoe Surgical Instruments. Double needle ligature device. 5,462,560, Cl. 606-144.000.

Stevens, Rick, to Unisys Corporation. Self-routing multi-stage photonic interconnect. 5,463,486, Cl. 359-117.000.

Stevens, William E.: *See—*
Rea, Perry J.; Miller, Michael R.; Iler, Gary T.; and Stevens, William E., 5,462,313, Cl. 285-21.000.

Stevenson, Scott A.: *See—*
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Stevens-Wright, Debbie; Russo, Massimo; Nielsen, Peter; and Bertram, Paul, to C.R. Bard, Inc. Actuator for use with steerable catheter. 5,462,527, Cl. 604-95.000.

Stewart, Derek; Forrest, John M. S.; and Muller, Werner, to Scottish Crop Research Institute. Detection of components of RNA viral glycoproteins using a mannose-specific lectin binding assay. 5,462,853, Cl. 435-5.000.

Stewart, J. Marcus: *See—*
Sutterlin, Philip H.; Downey, Walter J.; Chui, Benjamin W.; Stewart, J. Marcus; and Hurlbut, Amy O., 5,463,662, Cl. 375-351.000.

Stief, Reinhard; Müller-Broll, Gerhard; Jost, Thomas; Mattutat, Manfred; and Schmitt, Klaus-Dieter, to Firma Carl Freudenberg. Wheel lining. 5,462,331, Cl. 296-198.000.

Stikeleather, Larry F.: *See—*
Singleton, John A.; and Stikeleather, Larry F., 5,462,660, Cl. 210-198.200.

Stjernlof, Nils P.: *See—*
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Stocker, Achim; and Woggon, Wolf D., to Hoffmann-La Roche Inc. Process for producing tocopherols. 5,462,865, Cl. 435-125.000.

Stoffer, James F., to Sensormatic Electronics Corporation. System and method for synchronizing a receiver of an electronic article surveillance system and a transmitter thereof. 5,463,376, Cl. 340-572.000.

Stöhr, Frank-Michael: *See—*
Jäger, Horst; Stöhr, Frank-Michael; and Schündehütte, Karl K. , 5,463,031, Cl. 534-618.000.

Stopyra, Stephen: *See—*
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Storage Technology Corporation: *See—*
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Storet, Isabelle, to Enichem Elastomeres France S.A. Process for preparing 1-chloro-1,3-butadiene. 5,463,153, Cl. 570-227.000.

Stork Protecon B.V.: *See—*
Ketels, Gerardus H. J., 5,462,477, Cl. 452-135.000.

StorMedia, Inc.: *See—*
Teng, Edward; and Eltoukhy, Atef H., 5,462,796, Cl. 428-336.000.

Strand, Neal T.: *See—*
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Stratton, Ken L.; Lueschow, Kevin J.; Barton, James C.; and Hayes, Thomas G., to Caterpillar Inc. Automatic tip angle control. 5,462,125, Cl. 172-826.000.

Strauser, Buford R.: *See—*
Moog, John F.; and Strauser, Buford R., 5,462,171, Cl. 206-592.000.

Street, David G.; Paff, Thomas J.; Thomas, Dean A.; and McGlynn, Joseph P., to Campbell Fittings, Inc. Quick action fluid coupling. 5,462,316, Cl. 285-81.000.

Stroech, Klaus: *See—*
Scherkenbeck, Jürgen; Himmler, Thomas; Böhm, Stefan; Hagemann, Hermann; Stroech, Klaus; Dutzmann, Stefan; Dehne, Heinz-Wilhelm; and Hänssler, Gerd, 5,462,955, Cl. 514-383.000.

Strong, David S.; Rosa, Richard P.; and Burnett, Brian S., to Black & Decker Inc. Lawn mower having improved handle-to-deck coupling arrangement. 5,461,847, Cl. 56-16.700.

Stroppolo, Federico; Bonadeo, Daniele; and Gazzaniga, Annibale, to Zambon Group S.p.A. Process for the preparation of salts of 2-(4-isobutylphenyl)propionic acid. 5,463,117, Cl. 562-496.000.

Stroud, Robert D.: *See—*
Dodt, William C.; and Stroud, Robert D., 5,463,519, Cl. 360-128.000.

Strunk, Harald: *See—*
Güstävel, Andreas; Horstkötter, Ralf; Schlenz, Rolf; and Strunk, Harald, 5,462,422, Cl. 425-129.100.

Stubler, Jérôme; and Chastagnoi, Raymond, to Freyssinet International et Cie. Methods and apparatuses for mounting multiple-strand stays of bridges. 5,461,743, Cl. 14-22.000.

Stuitje, Peter; Harkema, Ronald; and Taal, Cornelie, to NWM de Kruithoorn B.V. Heavy metal alloy and method for its production. 5,462,576, Cl. 75-248.000.

Stüssi, Edgar: *See—*
Luthi, Simon; Kälin, Xavier; Scholz, Wolfgang; and Stüssi, Edgar, 5,461,800, Cl. 36-28.000.

Su, Ching-Fang. Adhesive plate assembly for sheet object. 5,462,782, Cl. 428-40.000.

Subramanian, Gopal; and Schneider, Richard F., to State of New York, Research Foundation of the. Metal chelating agents for medical application. 5,463,030, Cl. 534-16.000.

Subsurface Technology Corporation: *See—*
Franz, James J.; and Hutchinson, Richard A., 5,462,092, Cl. 138-177.000.

Suda, Shinji: *See—*
Matsuishi, Tsugumi; Hori, Toshihiko; and Suda, Shinji, 5,463,738, Cl. 395-823.000.

Sudhakar, Chakka; Dolfinger, Frank, Jr.; Cesar, Max R.; Patel, Mahendra S.; and Fritz, Paul O., to Texaco Inc. Hydrodearomatization of hydrocarbon oils using novel "phosphorus treated carbon" supported metal sulfide catalysts. 5,462,651, Cl. 208-143.000.

Sugahara, Masayuki: *See—*
Kurosawa, Miki; Ogawa, Shuji; Sugahara, Masayuki; Funai, Kiyoshi; Yumura, Takashi; and Yamamoto, Tetsu, 5,463,202, Cl. 219-121.830.

Sugai, Teruo: *See—*
Yamazaki, Hiraku; Sugai, Teruo; Kato, Shigeo; Tazoe, Haruo; Hotate, Shiroh; and Goto, Iwao, 5,462,800, Cl. 428-408.000.

Suganuma, Hiroshi: *See—*
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Suganuma, Hiroyuki: *See—*
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Sugawara, Glenn S.: *See—*
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Sugawara, Tomoo; Kudo, Shingo; and Okumura, Kin-ichi, to Nippon Zeon Co., Ltd. Metathesis catalyst system. 5,463,002, Cl. 526-161.000.

Sugawara, Yoshitaka: *See—*
Sakurai, Naoki; and Sugawara, Yoshitaka, 5,463,243, Cl. 257-524.000.

Sugeno, Miwa: *See—*
Taguchi, Hideo; Shioura, Kozo; and Sugeno, Miwa, 5,462,571, Cl. 65-437.000.

Sugibayashi, Tadahiko: *See—*
Aimoto, Yoshiharu; and Sugibayashi, Tadahiko, 5,463,591, Cl. 365-230.050.

Sugimura, Yoshikane: *See—*
Maeda, Akira; Sugimura, Yoshikane; Funabashi, Motohisa; Nakano, Toshihiko; Someya, Ryuko; and Kosaka, Michitaka, 5,463,718, Cl. 395-23.000.

Suginaka, Akinori: *See—*
Miyazaki, Tsuyoshi; Sanchika, Kouzoh; Nishida, Mitsuhiro; Yasukohchi, Tohru; Kitano, Shigeru; Suginaka, Akinori; and Kadoma, Yoshihito, 5,463,066, Cl. 548-112.000.

Sugiura, Susumu: *See—*
Makita, Takeshi; Sugiura, Susumu; and Yamada, Osamu, 5,463,478, Cl. 358-455.000.

Sugiyama, Akihiro: *See—*
Suzuki, Takeshi; and Sugiyama, Akihiro, 5,463,431, Cl. 351-226.000.

Sugiyama, Norihide; Nakamura, Masaru; Moriyama, Sumihiro; and Sasaki, Fumihiro, to Japan Gore-Tex, Inc. Oil-and water repellent gas-permeable filter. 5,462,586, Cl. 96-13.000.

Sugiyama, Shunichi; Kametani, Hiroshi; Yoshikoshi, Hideyuki; Ikeda, Nobuaki; and Hara, Tomihiro, to NKK Corporation; Kokan Mining Co., Ltd.; and Irox-NKK Co., Ltd. Method of manufacturing composite ferrite. 5,462,686, Cl. 252-62.620.

Sulek, Stanislaw: *See—*
Saksena, Sanjeev; Sulek, Stanislaw; and Hussein, Hany M. G., 5,462,544, Cl. 606-15.000.

Sullivan, Dennis J.; Butler, Aaron S.; and Kelley, Mark A., to United Technologies Corporation. Gas turbine engine combustion liner float wall cooling arrangement. 5,461,866, Cl. 60-757.000.

Sullivan, John J., Jr.: *See—*
Lippman, Jerome; Dolan, Michael J.; Sullivan, John J., Jr.; and Viscovitz, John H., 5,462,688, Cl. 252-89.100.

Sulzbach, Reinhard: *See—*
Beyer, Gerhard; Sulzbach, Reinhard; Wess, Eduard; and Hengel, Rolf, 5,463,021, Cl. 528-482.000.

Sumi, Yoshihiko; Ichikawa, Yataro; Aoki, Nobuo; and Muramatsu, Masami, to Teijin Limited. Protein having human plasmin inhibiting activity. 5,463,025, Cl. 530-380.000.

Sumikawa, Michito; Koguchi, Yoshihito; Ohgane, Takao; Irie, Yasuo; and Takahashi, Satoji, to Ajinomoto Co., Inc. Crystals of N- (trans-4-isopropylcyclohexlycarbonyl)-D-phenylalanine and methods for preparing them. 5,463,116, Cl. 562-450.000.

Sumikin Chemical Co., Ltd.: *See—*
Muroi, Takashiro; Sato, Toshio; Ito, Ikuo; and Takeda, Kyoichi, 5,463,156, Cl. 585-400.000.

Sumino, Motoshige; Tani, Tsutomu; and Sano, Atsunori, to WAKO Pure Chemical Industries, Ltd. Process for preparing 1,2-pyrazolidine-4-yl-disulfide compound. 5,463,075, Cl. 548-365.100.

Sumitomo Chemical Company, Limited: *See—*
Akahori, Kingo; Ohta, Yoshiteru; Omura, Takashi; Fujita, Mahito; and Harada, Naoki, 5,463,032, Cl. 534-642.000.
Hayashida, Haruo; Ichige, Akihiro; Ogawa, Tadatoshi; Yamada, Takeshi; Tada, Teruo; Zenigame, Masaaki; Wano, Toyoki; and Kondo, Kazuo, 5,462,777, Cl. 428-2.000.
Masumoto, Katuhisa; Nagatomi, Toshio; Nakamura, Akihiko; and Yamada, Yoshimi, 5,463,069, Cl. 548-190.000.
Meki, Naoto; Imahase, Tomotoshi; Nishida, Kazue; Fujimoto, Hiroaki; Mikitani, Kenichi; Takano, Hirotaka; Ogasawara, Yoriko; and Tamaki, Masahiro, 5,462,961, Cl. 514-407.000.
Miyoshi, Yoshihiro; Shiraishi, Hiroyuki; Kawai, Kiyoshi; and Koga, Hideaki, 5,463,000, Cl. 526-119.000.
Nishii, Shinji; Wake, Shigeo; and Ogawa, Takeshi, 5,463,103, Cl. 558-341.000.
Shinonaga, Hideo; and Sogabe, Satoru, 5,462,987, Cl. 524-451.000.

Sumitomo Chemical Co., Ltd.: *See—*

  - Saito, Noriaki; Morimoto, Takashi; Takebe, Kazuo; Shiomi, Yutaka; Naitoh, Shigeki; and Kanagawa, Shuichi, 5,462,997, Cl. 525-507.000.
  - Yamamoto, Keisaku; Ikeda, Kiyoshi; and Fukuyama, Masahiro, 5,462,975, Cl. 521-90.000.
- Sumitomo Electric Industries, Inc.: *See—*
  - Mukai, Hidehito; Sato, Kenichi; and Shibuta, Nobuhiro, 5,462,920, Cl. 505-432.000.
- Sumitomo Electric Industries, Ltd.: *See—*
  - Nakamura, Takao; Inada, Hiroshi; and Iiyama, Michitomo, 5,462,918, Cl. 505-193.000.
  - Yui, Dai; Suganuma, Hiroshi; Ishikawa, Shinji; and Semura, Shigeru, 5,463,708, Cl. 385-49.000.
- Sumitomo Electric Industries,Ltd.: *See—*
  - Tanaka, So; and Iiyama, Michitomo, 5,462,919, Cl. 505-410.000.
- Sumitomo Heavy Industries Ltd.: *See—*
  - Kondoh, Masatoshi, 5,462,763, Cl. 427-96.000.
- Sumitomo Metal Ceramics Inc.: *See—*
  - Yano, Keiichi; Takahashi, Takashi; Kimura, Kazuo; Sato, Yoshitoshi; Yamakawa, Kouji; Yamamoto, Toshishige; Fujii, Masafumi; Hashimoto, Shizuki; and Takamichi, Hiroshi, 5,463,248, Cl. 257-677.000.
- Sumitomo Metal Industries, Ltd.: *See—*
  - Asabe, Kazutaka; Nishiguchi, Masaru; and Yamamoto, Sukeyoshi, 5,462,808, Cl. 428-551.000.
  - Yano, Keiichi; Takahashi, Takashi; Kimura, Kazuo; Sato, Yoshitoshi; Yamakawa, Kouji; Yamamoto, Toshishige; Fujii, Masafumi; Hashimoto, Shizuki; and Takamichi, Hiroshi, 5,463,248, Cl. 257-677.000.
- Sumitomo Wiring Systems, Ltd.: *See—*
  - Tsuji, Takeshi; and Saito, Masashi, 5,462,449, Cl. 439-188.000.
- Summers, James H.: *See—*
  - DeWitt, Jimmie E.; Holck, Timothy M.; Summers, James H.; and Emrick, Samuel L., 5,463,775, Cl. 395-184.010.
- Sun Company, Inc. (R&M): *See—*
  - Resasco, Daniel E.; Marcus, Bonita K.; Huang, Chen-Shi; and Durante, Vincent A., 5,462,904, Cl. 502-222.000.
- Sun Microsystems, Inc.: *See—*
  - Burward-Hoy, Trevor, 5,461,766, Cl. 29-447.000.
- Sun, Young-Jen, to NEC Electronics, Inc. Current switch for a high speed DAC. 5,463,394, Cl. 341-136.000.
- Sunaga, Isao: *See—*
  - Ohashi, Takashi; Hembo, Motoshi; Nishizawa, Takatoshi; and Sunaga, Isao, 5,462,788, Cl. 428-201.000.
- Sunaga, Takayuki: *See—*
  - Inaba, Shigeru; Fukuhara, Masaaki; Hirota, Makoto; Yamamoto, Mitsuo; Abe, Jun; Miyata, Hideaki; Sunaga, Takayuki; Ishikawa, Toru; Shiina, Yoshio; Isosu, Toru; and Kanno, Makoto, 5,463,452, Cl. 355-246.000.
- Sundberg, Carl-Erik W.: *See—*
  - Dorward, Sean M.; Jayant, Nuggehally S.; Johnston, James D.; Quackenbush, Schuyler R.; Seshadri, Nambirajan; and Sundberg, Carl-Erik W., 5,463,641, Cl. 371-374.000.
- Sung, Janmye: *See—*
  - Chiu, Tzu-Yin; Erceg, Frank M.; Krafty, Francis A.; Liu, Te-Yin M.; Possanza, William A.; and Sung, Janmye, 5,462,888, Cl. 437-57.000.
- Sunpower, Inc.: *See—*
  - Beale, William T.; Lane, Neill W.; and McEntee, Jarlath, 5,461,859, Cl. 60-517.000.
- Supernak, Janusz. Adjustments for window shades. 5,462,105, Cl. 160-323.100.
- Surface Engineering Technologies, Division of Innerdyne, Inc.: *See—*
  - Hu, Chen-Ze; Dolence, Eric K.; Osaki, Shigemasa; and Sanders, Clifton G., 5,463,010, Cl. 528-25.000.
- Suspa Compart Aktiengesellschaft: *See—*
  - Bauer, Jürgen, 5,462,248, Cl. 248-161.000.
- Sutherland, John W. H.: *See—*
  - Bale Oenick, Marsha D.; Detwiler, Richard L.; Eikenberry, Jon N.; and Sutherland, John W. H., 5,462,858, Cl. 435-16.000.
- Sutterlin, Philip H.; Downey, Walter J.; Chui, Benjamin W.; Stewart, J. Marcus; and Hurlbut, Amy O., to Echelon Corporation. Apparatus and method for reducing errors in data caused by noise through use of blanking. 5,463,662, Cl. 375-351.000.
- Suzukawa, Yorio, to Asahi Seiko Kabushiki Kaisha. Coin dispensing apparatus. 5,462,480, Cl. 453-49.000.
- Suzuki, Akiyoshi: *See—*
  - Muraki, Masato; Suzuki, Akiyoshi; and Imai, Shunzo, 5,463,497, Cl. 359-618.000.
- Suzuki, Hidenori: *See—*
  - Oka, Tohru; Harada, Chikao; and Suzuki, Hidenori, 5,462,051, Cl. 128-630.000.
- Suzuki, Hiroshi, to NEC Corporation. Fast connection setup interfaces using pre-assigned virtual channel identifiers. 5,463,621, Cl. 370-60.000.
- Suzuki, Hiroshi: *See—*
  - Fukumoto, Takehiko; Iwai, Daisuke; Okano, Shigeo; Suzuki, Hiroshi; and Oshima, Mitsuyoshi, 5,463,149, Cl. 570-135.000.
- Suzuki, Hiroyuki, to Sharp Kabushiki Kaisha. Objective-lens driving apparatus. 5,463,501, Cl. 359-814.000.
- Suzuki, Hiroyuki: *See—*
  - Suzuki, Yuji; Shimizu, Hirohiko; Suzuki, Hiroyuki; and Tsuji, Kiyoaki, 5,463,509, Cl. 360-99.060.
- Suzuki, Keizo: *See—*
  - Ono, Tetsuo; Mizutani, Tatsumi; and Suzuki, Keizo, 5,462,635, Cl. 216-67.000.
- Suzuki, Kenji, to Fuji Photo Film Co., Ltd. Method and apparatus for image photometering. 5,463,445, Cl. 355-71.000.
- Suzuki, Kouji: *See—*
  - Narahara, Hiroshi; and Suzuki, Kouji, 5,462,579, Cl. 75-624.000.
- Suzuki, Kunihiro: *See—*
  - Sano, Akira; Shiraishi, Takeichi; Suzuki, Kunihiro; Okamoto, Mitsuo; Usui, Katumi; Shimizu, Hiroyuki; and Matsuura, Kazuo, 5,463,001, Cl. 526-124.500.
- Suzuki, Masanao: *See—*
  - Morita, Shigetaka; Igarashi, Yoshio; and Suzuki, Masanao, 5,462,612, Cl. 148-439.000.
- Suzuki, Mituru: *See—*
  - Esaki, Toshiro; Suzuki, Mituru; Sato, Susumu; Takahashi, Kohichi; and Shimizu, Makoto, 5,462,240, Cl. 242-348.100.
- Suzuki, Nobuo: *See—*
  - Kai, Osamu; Muroi, Junichi; Suzuki, Nobuo; Takagi, Tatsumi; Sakata, Shigekazu; and Oikawa, Hideyuki, 5,463,679, Cl. 379-145.000.
- Suzuki, Shin: *See—*
  - Iji, Masahiro; Yoda, Masami; Suzuki, Shin; Ishizuka, Kaoru; Kubo, Sotoo; Yamaki, Isao; and Hashimoto, Toshikuni, 5,462,672, Cl. 210-727.000.
- Suzuki, Shinichi; and Kijimuta, Hitoshi, to Asahi Glass Company Ltd. Recording sheet and process for its production. 5,463,178, Cl. 428-216.000.
- Suzuki, Takeshi; and Sugiyama, Akihiro, to Kabushiki Kaisha Topcon. Perimeter. 5,463,431, Cl. 351-226.000.
- Suzuki, Tetsuji: *See—*
  - Takanashi, Itsuo; Nakagaki, Shintaro; Negishi, Ichiro; Suzuki, Tetsuji; Tatsumi, Fujiko; Takahashi, Ryusaku; and Maeno, Keiichi, 5,463,468, Cl. 358-296.000.
- Suzuki, Tomita: *See—*
  - Yuhta, Toshio; Nishimura, Ikuya; Kano, Daijiro; Saitou, Tsuyoshi; Suzuki, Tomita; and Tanaka, Mamoru, 5,462,362, Cl. 384-13.000.
- Suzuki, Tsuneji: *See—*
  - Fukazawa, Nobuyuki; Suzuki, Tsuneji; Kawauchi, Nobuya; Komatsu, Hironori; Otsuka, Kengo; and Nakajima, Yuki, 5,463,061, Cl. 546-158.000.
- Suzuki, Yuji; Shimizu, Hirohiko; Suzuki, Hiroyuki; and Tsuji, Kiyoaki, to Sony Corporation. Disc cartridge holder having a shutter control arm disposed in a key-hole shaped aperture formed in the cartridge holder. 5,463,509, Cl. 360-99.060.
- Svanstroem, Anders; and Josefsson, Paer, to IRO AB. Measuring weft feeder with yarn clamping action. 5,462,096, Cl. 139-452.000.
- Svendsen, David A., to York Technology Limited. Apparatus for analyzing optical properties of transparent objects. 5,463,466, Cl. 356-440.000.
- Svensson, Anders. Holding device. 5,462,127, Cl. 173-162.200.
- Svensson, Kjell A. I.; Wikstrom, Hakan V.; Carlsson, Per A. E.; Boije, Anna M. P.; Waters, R. Nicholas; Sonesson, Clas A.; Stjernlof, Nils P.; Andersson, Bengt R.; and Hansson, Lars O., to Upjohn Company, The. Centrally acting substituted phenylazacycloalkanes. 5,462,947, Cl. 514-317.000.
- Swager, Ronald W.: *See—*
  - Hansen, Erling, 5,462,474, Cl. 451-41.000.
- Swamy, Deepak: *See—*
  - Bell, James S.; and Swamy, Deepak, 5,463,191, Cl. 174-263.000.
- Swanson, Carl A.: *See—*
  - Brightman, Timothy H.; Gulick, Kenneth; Hanson, Robert L.; Herrick, Brian R.; Jeffery, Edwin A.; Kozo, Maria J.; and Swanson, Carl A., 5,462,350, Cl. 312-351.700.
- Swanson, Michael D.: *See—*
  - Elko, David A.; Frey, Jeffrey A.; Helffrich, Audrey A.; Isenberg, John F., Jr.; Moore, Brian B.; Nick, Jeffery M.; Swanson, Michael D.; and Williams, Joseph A., 5,463,736, Cl. 395-848.000.
- Swarovski Optik KG: *See—*
  - Murg, Erwin, 5,463,495, Cl. 359-429.000.
- Swenson, Douglas A.; Fox, Herbert J.; Krueger, Dennis L.; and Lockridge, Rochelle L., to Minnesota Mining and Manufacturing Company. Elastic film laminate. 5,462,708, Cl. 264-174.110.
- Swift, Graham: *See—*
  - Paik, Yi H.; Simon, Ethan S.; and Swift, Graham, 5,463,017, Cl. 528-361.000.
- Swift, Joseph A.; and Orlowski, Thomas E., to Xerox Corporation. Synchronized process for catalysis of electroless metal plating on plastic. 5,462,773, Cl. 427-555.000.
- Sydansk, Robert D., to Marathon Oil Company. Foamed gel for blocking fluid flow in soil. 5,462,390, Cl. 405-264.000.
- Sylvester, Gail M.: *See—*
  - Mueller, Thomas R.; and Sylvester, Gail M., 5,463,314, Cl. 324-146.000.
- Symetrix Corporation: *See—*
  - De Araujo, Carlos A. P.; McMillan, Larry D.; and Cuchiaro, Joseph D., 5,463,244, Cl. 257-530.000.
- Synosky, Steven P.; Greenberg, Michael J.; and McGrew, Gordon N., to Wm. Wrigley Jr. Company. Abhesive chewing gum with improved sweetness profile. 5,462,754, Cl. 426-4.000.
- Syntex (U.S.A.) Inc.: *See—*
  - Barr, Stephen M.; and Rohlf, Paul A., 5,462,875, Cl. 435-289.100.
- Synthes (U.S.A.): *See—*
  - Weigum, Hans, 5,462,547, Cl. 606-65.000.
- Szablikowski, Klaus: *See—*
  - Buysch, Hans-Josef; Klausener, Alexander; Szablikowski, Klaus; Balser, Klaus; and Wilke, Michaela, 5,463,034, Cl. 536-17.200.

Kniewske, Reinhard; Kiesewetter, René; Reinhardt, Eugen; and Szablikowski, Klaus, 5,463,036, Cl. 536-86.000.

Szameitat, Jürgen: *See—*

Bahrmann, Helmut; Greb, Wolfgana; Heymanns, Peter; Lappe, Peter; Müller, Thomas; Szameitat, Jürgen; and Wiebus, Ernst, 5,462,986, Cl. 524-296.000.

Bahrmann, Helmut; Greb, Wolfgang; Heymanns, Peter; Lappe, Peter; Müller, Thomas; Szameitat, Jürgen; and Wiebus, Ernst, 5,463,147, Cl. 568-882.000.

Szedon, William A.: *See—*

Ladina, Joseph M.; Exley, Timothy R.; and Szedon, William A., 5,462,186, Cl. 215-330.000.

Szirmai, Stephen G., to Commonwealth Scientific and Industrial Research Organisation; and Auspharm International Limited. Producing electrosuspensions. 5,463,524, Cl. 361-230.000.

Szűcs, Johann. Apparatus and method for treating sensitive surface, in particular of sculpture. 5,462,605, Cl. 134-7.000.

Szurkowski, Edward S.: *See—*

Blahut, Donald E.; and Szurkowski, Edward S., 5,463,728, Cl. 395-158.000.

Szuszman, Paul J.: *See—*

Kotwicki, Allan J.; Szuszman, Paul J.; Christensen, Edward L.; and Lloyd, Susan J., 5,462,038, Cl. 123-681.000.

Taal, Cornelie: *See—*

Stuitje, Peter; Harkema, Ronald; and Taal, Cornelie, 5,462,576, Cl. 75-248.000.

Tabart, Michel: *See—*

Achard, Daniel; Grisoni, Serge; Malleron, Jean-Luc; Peyronel, Jean-Francois; and Tabart, Michel, 5,463,077, Cl. 548-515.000.

Tabei, Seikichi: *See—*

Ichimura, Shozo; Tabei, Seikichi; and Hashimoto, Michinori, 5,462,693, Cl. 252-190.000.

Taber, Susan J.: *See—*

Abbey, Nelson D., III; Dreier, Richard L.; and Taber, Susan J., 5,461,896, Cl. 72-181.000.

Tachi, Katsuichi, to Sony Corporation. Synchronizing apparatus for synchronizing audio signal with video signal. 5,463,425, Cl. 348-515.000.

Tachikawa, Akio: *See—*

Yuasa, Yoshifumi; Okeda, Yoshiki; Tachikawa, Akio; Nagakura, Akira; and Tsuruta, Haruki, 5,463,118, Cl. 562-502.000.

Tada, Teruo: *See—*

Hayashida, Haruo; Ichige, Akihiro; Ogawa, Tadatoshi; Yamada, Takeshi; Tada, Teruo; Zenigame, Masaaki; Wano, Toyoki; and Kondo, Kazuo, 5,462,777, Cl. 428-2.000.

Tagami, Satoru: *See—*

Fukuoka, Akira; Kawai, Jun; and Tagami, Satoru, 5,463,266, Cl. 310-359.000.

Tagatac, Daniel D.: *See—*

Collins, Cynthia B.; Lee, Young; and Tagatac, Daniel D., 5,463,683, Cl. 379-201.000.

Tagawa, Junichi: *See—*

Furukawa, Hiroki; Tagawa, Junichi; Kanamori, Takeo; and Ibaraki, Satoru, 5,463,618, Cl. 370-32.100.

Taguchi, Hideo; Shioura, Kozo; and Sugeno, Miwa, to Nitto Boseki Co., Ltd. Nozzle tip for spinning glass fiber having deformed cross-section and a plurality of projections. 5,462,571, Cl. 65-437.000.

Taguchi, Tetsu, to NEC Corporation. Formant extraction on the basis of LPC information developed for individual partial bandwidths. 5,463,716, Cl. 395-2.180.

Tähkänen, Pekka, to Halton System Oy. Device for handling recycling packages, such as bottles and cans. 5,461,972, Cl. 100-45.000.

Tahoe Surgical Instruments: *See—*

Stevens, Jon A., 5,462,560, Cl. 606-144.000.

Tai, Alice F.: *See—*

Baum, Thomas H.; Mukherjee, Shyama P.; O'Toole, Terrence R.; Tai, Alice F.; and Viehbeck, Alfred, 5,462,897, Cl. 437-230.000.

Tajima, Kazuaki: *See—*

Sato, Masahito; Tajima, Kazuaki; Matsuda, Yoshio; and Miyamoto, Takahumi, 5,462,838, Cl. 430-313.000.

Tajima, Kenichi: *See—*

Nagano, Saburou; Tateno, Shuichi; Kamitubo, Kouichi; Tajima, Kenichi; and Nakanishi, Masahito, 5,462,813, Cl. 428-698.000.

Tajiri, Kouji: *See—*

Mikoshiba, Yoshihisa; Adachi, Teruhiko; and Tajiri, Kouji, 5,462,802, Cl. 428-376.000.

Takabatake, Akihiko; Uramoto, Shinichi; and Nakagawa, Shinichi, to Mitsubishi Denki Kabushiki Kaisha. Phase clocked latch having both parallel and shunt connected switches for transmission gates. 5,463,340, Cl. 327-211.000.

Takada, Toshio: *See—*

Shinjo, Teruya; Yamamoto, Hidefumi; Anno, Toshihiko; and Takada, Toshio, 5,462,795; Cl. 428-332.000.

Takada, Yasuo: *See—*

Nagami, Tetsuo; Ogura, Yoshitsugu; Ogai, Masahiko; Fukushima, Yoshiaki; Inagaki, Shinji; Fukumoto, Kazuhiro; Banno, Kouji; Sakakibara, Yuji; Takada, Yasuo; Ohta, Takashi; Okada, Akane; Yamada, Yukimura; Hayashi, Kiyotaka; Matsuura, Shinji; and Kuroda, Kaz, 5,462,905, Cl. 502-232.000.

Takagi, Takeyuki: *See—*

Watanabe, Makoto; Mochizuki, Isao; Sato, Yoshitsugu; Takagi, Takeyuki; and Okada, Hiroaki, 5,463,195, Cl. 200-5.00A.

Takagi, Tatsumi: *See—*

Kai, Osamu; Muroi, Junichi; Suzuki, Nobuo; Takagi, Tatsumi; Sakata, Shigekazu; and Oikawa, Hideyuki, 5,463,679, Cl. 379-145.000.

Takahashi, Hideaki: *See—*

Tanaka, Nobuhiko; Narabayashi, Tadashi; Miyano, Hiroshi; Takahashi, Hideaki; Yamada, Katsumi; and Yasuda, Makoto, 5,462,229, Cl. 239-397.500.

Takahashi, Kazushi, to Canon Denshi Kabushiki Kaisha. Disk drive system having combined clamp/eject switch. 5,463,510, Cl. 360-99.070.

Takahashi, Kohichi: *See—*

Esaki, Toshiro; Suzuki, Mituru; Sato, Susumu; Takahashi, Kohichi; and Shimizu, Makoto, 5,462,240, Cl. 242-348.100.

Takahashi, Kunihiro; Kamiya, Masaaki; Kojima, Yoshikazu; and Takasu, Hiroaki, to Seiko Instruments Inc. CMOS structure with parasitic channel prevention. 5,463,238, Cl. 257-351.000.

Takahashi, Naoya: *See—*

Sotoyanagi, Osamu; Okami, Yoshinori; and Takahashi, Naoya, 5,463,771, Cl. 395-600.000.

Takahashi, Ryusaku: *See—*

Takanashi, Itsuo; Nakagaki, Shintaro; Negishi, Ichiro; Suzuki, Tetsuji; Tatsumi, Fujiko; Takahashi, Ryusaku; and Maeno, Keiichi, 5,463,468, Cl. 358-296.000.

Takahashi, Satoji: *See—*

Sumikawa, Michito; Koguchi, Yoshihito; Ohgane, Takao; Irie, Yasuo; and Takahashi, Satoji, 5,463,116, Cl. 562-450.000.

Takahashi, Tadashi: *See—*

Sakamoto, Akihiko; Takahashi, Tadashi; and Ninomiya, Masayuki, 5,462,805, Cl. 428-430.000.

Takahashi, Takashi: *See—*

Yano, Keiichi; Takahashi, Takashi; Kimura, Kazuo; Sato, Yoshitoshi; Yamakawa, Kouji; Yamamoto, Toshishige; Fujii, Masafumi; Hashimoto, Shizuki; and Takamichi, Hiroshi, 5,463,248, Cl. 257-677.000.

Takahashi, Yuzo: *See—*

Naka, Michiharu; Koizumi, Hideki; Takahashi, Yuzo; Kinoshita, Hirotugu; and Mishima, Masaru, 5,462,684, Cl. 252-51.50R.

Takami, Satoshi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Strobe control apparatus of camera. 5,463,437, Cl. 354-149.110.

Takamichi, Hiroshi: *See—*

Yano, Keiichi; Takahashi, Takashi; Kimura, Kazuo; Sato, Yoshitoshi; Yamakawa, Kouji; Yamamoto, Toshishige; Fujii, Masafumi; Hashimoto, Shizuki; and Takamichi, Hiroshi, 5,463,248, Cl. 257-677.000.

Takamoto, Yoshifumi: *See—*

Kakuta, Hitoshi; Kamo, Yoshihisa; and Takamoto, Yoshifumi, 5,463,765, Cl. 395-182.040.

Takamuku, Kenji: *See—*

Minami, Takanori; Shiraishi, Noriaki; Shimizu, Tsutomu; Takamuku, Kenji; Tsushio, Yoshinori; Mizushima, Yoshio; Yoshimoto, Kazuyuki; and Kadokura, Masaki, 5,462,021, Cl. 123-3.000.

Takanashi, Itsuo; Nakagaki, Shintaro; Negishi, Ichiro; Suzuki, Tetsuji; Tatsumi, Fujiko; Takahashi, Ryusaku; and Maeno, Keiichi, to Victor Company of Japan, Ltd. Display unit having a light-to-light conversion element. 5,463,468, Cl. 358-296.000.

Takano, Hirotaka: *See—*

Meki, Naoto; Imahase, Tomotoshi; Nishida, Kazue; Fujimoto, Hiroaki; Mikitani, Kenichi; Takano, Hirotaka; Ogasawara, Yoriko; and Tamaki, Masahiro, 5,462,961, Cl. 514-407.000.

Takano, Kiyotaka; Fusegawa, Izumi; Yamagishi, Hirotoshi; Mizuishi, Koji; and Ogino, Katsuhiko, to Shin-Etsu Handotai Co., Ltd. Apparatus for supplying granular raw material for a semiconductor single crystal pulling apparatus. 5,462,010,.Cl. 117-14.000.

Takano, Manabu: *See—*

Inoue, Takahiro; Goto, Masahiro; Sasame, Hiroshi; Tsukida, Shinichi; and Takano, Manabu, 5,463,450, Cl. 355-219.000.

Takanobu, Kiyoshi: *See—*

Tamazawa, Kazuharu; Kojima, Tadao; Arima, Hideki; Murakami, Yukiyasu; Isomura, Yasuo; Okada, Minoru; Takanobu, Kiyoshi; and Takenaka, Toichi, 5,463,064, Cl. 546-281.000.

Takao, Shino; Kometani, Shinji; and Saito, Hitoshi, to Dai Nippon Printing Co., Ltd. Thermal transfer image-receiving sheet. 5,462,911, Cl. 503-227.000.

Takaragi, Yoichi: *See—*

Funada, Masahiro; Ohta, Ken-ichi; Takaragi, Yoichi; and Ohta, Eiji, 5,463,469, Cl. 358-296.000.

Takasago International Corporation: *See—*

Matsushima, Yoshimasa; and Hagiwara, Toshimitsu, 5,463,128, Cl. 564-452.000.

Yuasa, Yoshifumi; Okeda, Yoshiki; Tachikawa, Akio; Nagakura, Akira; and Tsuruta, Haruki, 5,463,118, Cl. 562-502.000.

Takase, Mitsuo; Fukuda, Nobuhiro; and Dodo, Toshihiro, to Mitsui Toatsu Chemicals, Incorporated. Circuit board for optical devices. 5,463,229, Cl. 257-59.000.

Takashina, Nobuaki, to Fujitsu Limited. Non-volatile semiconductor memory device. 5,463,583, Cl. 365-189.060.

Takasu, Hiroaki: *See—*

Takahashi, Kunihiro; Kamiya, Masaaki; Kojima, Yoshikazu; and Takasu, Hiroaki, 5,463,238, Cl. 257-351.000.

Takatori, Sunao; Kumagai, Ryohei; Matsumoto, Koji; and Yamamoto, Makoto, to Yozan Inc.; and Sharp Corporation. Inductively coupled neural network. 5,463,717, Cl. 395-24.000.

Takatsuka, Akio: *See—*

Nakano, Masaaki; Inoue, Tomoaki; Amano, Hideaki; Takatsuka, Akio; Beppu, Osamu; Mori, Kenji; Yoshida, Takashi; and Kohno, Takashi, 5,463,511, Cl. 360-99.080.

Takatsuka, Masanori, to Yamaha Corporation. Tennis racket with longitudinal strings different in tensile force from transversal strings. 5,462,274, Cl. 273-23.00C.

Takebe, Kazuo: *See—*

Saito, Noriaki; Morimoto, Takashi; Takebe, Kazuo; Shiomi, Yutaka; Naitoh, Shigeki; and Kanagawa, Shuichi, 5,462,997, Cl. 525-507.000.

Takeda Chemical Industries: *See—*

Goto, Giichi; Miyamoto, Masaomi; and Ishihara, Yuji, 5,462,934, Cl. 514-183.000.

Takeda Chemical Industries, Ltd.: *See—*

Takehiko, Naka; and Yoshiyuki, Inada, 5,463,073, Cl. 548-303.700.

Takeda, Hiroyuki: *See—*

Hidano, Tetsuhiro; Takeda, Hiroyuki; Tsukada, Masayuki; Yamamoto, Kazuo; and Inoue, Atsushi, 5,463,038, Cl. 536-124.000.

Takeda, Keiso: *See—*

Itou, Takaaki; Tanaka, Hiroshi; Takeda, Keiso; Ohnaka, Hidemi; Kunitake, Kazuhisa; and Tanahashi, Toshio, 5,461,857, Cl. 60-276.000.

Takeda, Kyoichi: *See—*

Muroi, Takashiro; Sato, Toshio; Ito, Ikuo; and Takeda, Kyoichi, 5,463,156, Cl. 585-400.000.

Takeda, Nobutoshi: *See—*

Terao, Kazuhiko; Iida, Hidetoku; Nakayama, Takeyasu; Kubo, Toshiya; Horigome, Jiro; Matsuoka, Yoshihiro; Takeda, Nobutoshi; and Mizuhashi, Tohru, 5,463,709, Cl. 385-85.000.

Takeda, Norio: *See—*

Shirai, Kazushi; Shinbo, Toshihiro; Takeda, Norio; and Arii, Mitsuzo, 5,463,316, Cl. 324-244.100.

Takeda, Yasuo: *See—*

Daimon, Junko; Takeda, Yasuo; and Kodama, Katsunori, 5,461,825, Cl. 47-71.000.

Takefumi, Tadayoshi: *See—*

Shiokawa, Yoshihiro; Takefumi, Tadayoshi; Matsumoto, Shunichi; and Sato, Yoshifumi, 5,463,095, Cl. 554-130.000.

Takegawa, Ichiro: *See—*

Nukada, Katsumi; Imai, Akira; Daimon, Katsumi; Iijima, Masakazu; Mashimo, Kiyokazu; Sakaguchi, Yasuo; and Takegawa, Ichiro, 5,463,043, Cl. 540-141.000.

Takehiko, Naka; and Yoshiyuki, Inada, to Takeda Chemical Industries, Ltd. Thienoimidazole derivatives, their production and use. 5,463,073, Cl. 548-303.700.

Takei, Toshiaki; Kayamori, Satoshi; and Ota, Hiroyuki, to Taogosei Co., Ltd. Matte electrodepositable coating composition and process for preparing the same. 5,462,985, Cl. 524-204.000.

Takemata, Toshiharu: *See—*

Maejima, Kazuhiro; and Takemata, Toshiharu, 5,461,980, Cl. 101-415.100.

Takemoto, Takatoshi, to Kabushiki Kaisha Ace Denken. Game machine having an apparatus for showing prize awarding combinations on rotating drums. 5,462,277, Cl. 273-121.00B.

Takenaka, Toichi: *See—*

Tamazawa, Kazuharu; Kojima, Tadao; Arima, Hideki; Murakami, Yukiyasu; Isomura, Yasuo; Okada, Minoru; Takanobu, Kiyoshi; and Takenaka, Toichi, 5,463,064, Cl. 546-281.000.

Takeoka, Kazuhiko: *See—*

Miyazoe, Seigo; Hisai, Tsuneyoshi; Fushimi, Akira; Takeoka, Kazuhiko; Okude, Yoshitaka; and Kurauchi, Takeo, 5,462,770, Cl. 427-407.100.

Takeuchi, Makoto: *See—*

Uchiyama, Seiji; Noguchi, Akio; Ushio, Yukihide; Matsuo, Shinpei; Serizawa, Youji; Takeuchi, Makoto; Yamada, Kazurou; and Kato, Junichi, 5,463,410, Cl. 347-133.000.

Takeuchi, Tatsuo; Nami, Yasuo; and Ishizuka, Jiro, to Canon Kabushiki Kaisha. Image forming apparatus capable of changing image forming conditions depending on side of recording material. 5,463,457, Cl. 355-313.000.

Takeuchi, Yoji: *See—*

Oshima, Toshio; Ohiwa, Tsunemi; Nishida, Masato; Matsumoto, Taiji; Itoh, Akihiko; and Takeuchi, Yoji, 5,463,212, Cl. 235-468.000.

Takeya, Hiroyuki: *See—*

Gschneidner, Karl A., Jr.; and Takeya, Hiroyuki, 5,462,610, Cl. 148-301.000.

Takiguchi, Takao: *See—*

Kosaka, Yoko; Takiguchi, Takao; Iwaki, Takashi; Togano, Takeshi; Nakamura, Shinichi; and Nakazawa, Ikuo, 5,462,694, Cl. 252-299.610.

Takito, Tetsuo; Inaba, Kazuki; Kinoshita, Yasuo; and Sasaki, Teruhiko, to Mitsubishi Oil Co., Ltd. Process for producing low viscosity lubricating base oil having high viscosity index. 5,462,650, Cl. 208-58.000.

Takizawa, Hiroshi, to NEC Corporation. Foldable portable telephone with control of audio circuitry based on the folded/unfolded position. 5,463,687, Cl. 379-433.000.

Takizawa, Toshiki: *See—*

Horikawa, Yasuo; Takizawa, Toshiki; and Akazawa, Taro, 5,463,003, Cl. 526-176.000.

Tallbäck, Göte, to Asea Brown Boveri AB. Method and a device for stirring a molten metal. 5,462,572, Cl. 75-10.160.

Talley, John J.: *See—*

Vazquez, Michael L.; Mueller, Richard A.; Talley, John J.; Getman, Daniel; DeCrescenzo, Gary A.; and Freskos, John N., 5,463,104, Cl. 514-533.000.

Talwalker, Ramesh T.; and Barve, Shirish S., to Arda Technologies. Antimicrobial composition and methods of use. 5,462,714, Cl. 422-37.000.

Tam, Kwok C., to General Electric Company. Method for constructing a three dimensional scanning trajectory capable of acquiring a complete set of radon data for exact image reconstruction of an object irradiated by a cone beam source. 5,463,721, Cl. 395-127.000.

Tam, Kwok C.: *See—*

Eberhard, Jeffrey W.; and Tam, Kwok C., 5,463,666, Cl. 378-4.000.

Tamaki, Masahiro: *See—*

Meki, Naoto; Imahase, Tomotoshi; Nishida, Kazue; Fujimoto, Hiroaki; Mikitani, Kenichi; Takano, Hirotaka; Ogasawara, Yoriko; and Tamaki, Masahiro, 5,462,961, Cl. 514-407.000.

Tamano, Akihiko: *See—*

Ikeda, Tsukasa; and Tamano, Akihiko, 5,461,777, Cl. 29-890.080.

Tamao, Yoshikuni: *See—*

Iwase, Norimichi; Morinaka, Yasuhiro; Tamao, Yoshikuni; Kanayama, Toshiji; and Yamada, Kumi, 5,462,941, Cl. 514-248.000.

Tamapack Co., Ltd.: *See—*

Ishikawa, Masaaki; and Yamada, Masao, 5,463,370, Cl. 340-439.000.

Tamata, Shin: *See—*

Nishi, Takashi; Matsuda, Masami; Noshita, Kenji; Kikuchi, Makoto; Izumida, Tatsuo; Tamata, Shin; and Kiuchi, Yoshimasa, 5,463,171, Cl. 588-4.000.

Tamazawa, Kazuharu; Kojima, Tadao; Arima, Hideki; Murakami, Yukiyasu; Isomura, Yasuo; Okada, Minoru; Takanobu, Kiyoshi; and Takenaka, Toichi, to Yamanouchi Pharmaceutical Co., Ltd. Dihydropyridine-3,5-dicarboxylic acid ester derivatives. 5,463,064, Cl. 546-281.000.

Tamura Electric Works, Ltd.: *See—*

Sasou, Hiroshi; Kaya, Tomoki; Watanabe, Tosiaki; and Fukaya, Shinji, 5,463,208, Cl. 235-380.000.

Tamura Electrics Works, Ltd.: *See—*

Kai, Osamu; Muroi, Junichi; Suzuki, Nobuo; Takagi, Tatsumi; Sakata, Shigekazu; and Oikawa, Hideyuki, 5,463,679, Cl. 379-145.000.

Tanabe, Kouji; and Nishioka, Naohiro, to Matsushita Electric Industrial Co., Ltd. Method for mounting electronic component on a flexible printed circuit board. 5,461,775, Cl. 29-840.000.

Tanahashi, Toshio: *See—*

Itou, Takaaki; Tanaka, Hiroshi; Takeda, Keiso; Ohnaka, Hidemi; Kunitake, Kazuhisa; and Tanahashi, Toshio, 5,461,857, Cl. 60-276.000.

Tanaka, Etsuo; Kai, Tadao; Okano, Hiroshi; Katayama, Akira; and Imura, Yoshio, to Nikon Corporation. Camera for preventing camera shake. 5,463,443, Cl. 354-430.000.

Tanaka, Hiroshi: *See—*

Hayashi, Kenji; Watanabe, Nobuhisa; Nose, Koichi; Tanaka, Hiroshi; Ohtsuka, Issei; Kokushi, Motoji; Hiyoshi, Hironobu; Kobayashi, Hiroko; Yamada, Toshie; and Horie, Toru, 5,462,958, Cl. 514-399.000.

Itou, Takaaki; Tanaka, Hiroshi; Takeda, Keiso; Ohnaka, Hidemi; Kunitake, Kazuhisa; and Tanahashi, Toshio, 5,461,857, Cl. 60-276.000.

Tanaka, Kazuhide: *See—*

Doi, Toshiya; Ozawa, Takeshi; Tanaka, Kazuhide; Yuasa, Toyotaka; Kamo, Tomoichi; and Matsuda, Shinpei, 5,462,922, Cl. 505-785.000.

Tanaka Kikinzoku Kogyo K.K.: *See—*

Betta, Ralph D.; Shoji, Toru; and Tanaka, Seiichiro, 5,461,864, Cl. 60-723.000.

Tanaka Kogyo Co., Ltd.: *See—*

Araki, Minoru; and Miyama, Shinichi, 5,461,787, Cl. 30-276.000.

Tanaka, Mamoru: *See—*

Yuhta, Toshio; Nishimura, Ikuya; Kano, Daijiro; Saitou, Tsuyoshi; Suzuki, Tomita; and Tanaka, Mamoru, 5,462,362, Cl. 384-13.000.

Tanaka, Masashi; Fukami, Toshiyuki; Katsukawa, Masato; and Nakamori, Hideo, to Mita Industrial Co., Ltd. Electrophotographic photoconductor having a photosensitive layer with charge generating particles and a charge transporting material dispersed in a binder. 5,462,825, Cl. 430-58.000.

Tanaka, Mitsutoshi, to Fuji Photo Film Co., Ltd. Non-aqueous battery with a block copolymer sealing member. 5,462,820, Cl. 429-174.000.

Tanaka, Nobuhiko; Narabayashi, Tadashi; Miyano, Hiroshi; Takahashi, Hideaki; Yamada, Katsumi; and Yasuda, Makoto, to Kabushiki Kaisha Toshiba. Steam injector. 5,462,229, Cl. 239-397.500.

Tanaka, Seiichiro: *See—*

Betta, Ralph D.; Shoji, Toru; and Tanaka, Seiichiro, 5,461,864, Cl. 60-723.000.

Tanaka, Shuji: *See—*

Nishihira, Keigo; and Tanaka, Shuji, 5,463,109, Cl. 560-157.000.

Tanaka, So; and Iiyama, Michitomo, to Sumitomo Electric Industries,Ltd. Method for manufacturing superconducting thin film formed of oxide superconductor having non superconducting region and device utilizing the superconducting thin film. 5,462,919, Cl. 505-410.000.

Tang, Nai-Yong: *See—*

Vincze, Albert M.; Seymour, Theodore J.; Culkeen, Patrick; Tang, Nai-Yong; Lewis, Gerald P.; Niessen, Paul; and Marlow, John V., 5,462,109, Cl. 164-479.000.

Tang, Sing C.; Lou, Maurice M. K.; and Balun, Thomas J., to Ford Motor Company. Method for designing a binder ring surface for a sheet metal part. 5,463,558, Cl. 364-472.000.

Tani, Tsutomu: *See—*

Sumino, Motoshige; Tani, Tsutomu; and Sano, Atsunori, 5,463,075, Cl. 548-365.100.

Taniai, Takayoshi; Satoh, Hajime; Shimura, Hidetoshi; and Saitoh, Tadashi, to Fujitsu Limited & Fujitsu Microcomputer Systems Ltd. Data control device generating different types of bus requests and transmitting requests directly to one of a number of arbiters for obtaining access to a respective bus. 5,463,740, Cl. 395-299.000.
Tanida, Kaichi: *See—*
  Omata, Tetsuo; and Tanida, Kaichi, 5,463,085, Cl. 549-273.000.
Tanifuji, Yoichi; and Yamamoto, Yasuhiro, to Shin-Etsu Chemical Co., Ltd. Vinyl chloride polymerization process using ball valves in recycle line. 5,462,998, Cl. 526-67.000.
Taniguchi, Akihisa, to Mitsubishi Denki Kabushiki Kaisha. Method of making field effect transistor with T-shaped gate electrode. 5,462,884, Cl. 437-39.000.
Tanimoto, Hiroyoshi: *See—*
  Toriumi, Akira; Shigyo, Naoyuki; Wada, Tetsunori; Tanimoto, Hiroyoshi; Ohuchi, Kazuya; and Yoshimi, Makoto, 5,463,234, Cl. 257-296.000.
Tanke, Eugene T., II; and Dodak, Tony M., to General Motors Corporation. Motor vehicle power steering gear. 5,462,132, Cl. 180-149.000.
Tanknology Corporation International: *See—*
  Bogle, Tom G.; Tuma, John E.; and Williams, Barry N., 5,461,906, Cl. 73-49.200.
Tanzer, Herbert J.: *See—*
  Hall, John T.; and Tanzer, Herbert J., 5,463,303, Cl. 320-2.000.
Taogosei Co., Ltd.: *See—*
  Takei, Toshiaki; Kayamori, Satoshi; and Ota, Hiroyuki, 5,462,985, Cl. 524-204.000.
Tappon, Ellen: *See—*
  Ho, May F.; and Tappon, Ellen, 5,463,413, Cl. 347-65.000.
Tarabocchia, John: *See—*
  von Wedel, Wedigo; Eickhoff, Hubertus; Weck, Manfred; Tarabocchia, John; Schelbert, Ulrich; and Möller, Alexander, 5,463,170, Cl. 588-207.000.
Target Marketing Limited: *See—*
  Allen, John, 5,462,283, Cl. 273-371.000.
Target Therapeutics, Inc.: *See—*
  Samson, Gene; Engelson, Erik T.; Chee, Hiram; and Woodard, Robert E., 5,462,523, Cl. 604-30.000.
Tarics, Alexander G. Composite seismic isolator and method. 5,461,835, Cl. 52-167.800.
Tarsha, Simon: *See—*
  McMillan, James S.; and Tarsha, Simon, 5,462,706, Cl. 264-138.000.
Tarutani, Yoshinobu: *See—*
  Otomo, Shigekazu; Kumasaka, Noriyuki; Shiiki, Kazuo; Yamashita, Takeo; Saito, Noritoshi; and Tarutani, Yoshinobu, 5,463,518, Cl. 505-171.000.
Tasaka, Hitoshi: *See—*
  Kamio, Shigeru; Hara, Mitsuo; and Tasaka, Hitoshi, 5,463,298, Cl. 318-599.000.
Task Force Tips, Inc.: *See—*
  McMillan, Stewart G.; and Kolacz, David J., 5,462,228, Cl. 239-285.000.
Tasset, Emmett L.: *See—*
  Wehmeyer, Richard M.; Walters, Marlin E.; Tasset, Emmett L.; and Brewster, Steven L., 5,463,140, Cl. 568-727.000.
Tate, Bruce A.; Chow, Alex C.; and Gest, Stephen B., to International Business Machines Corporation. Method and apparatus using dictionary of methods and states for high performance context switching between build and run modes in a computer application builder program. 5,463,769, Cl. 395-700.000.
Tateno, Shuichi: *See—*
  Nagano, Saburou; Tateno, Shuichi; Kamitubo, Kouichi; Tajima, Kenichi; and Nakanishi, Masahito, 5,462,813, Cl. 428-698.000.
Tateoka, Masamichi, to Canon Kabushiki Kaisha. Plural-beam scanning optical apparatus. 5,463,418, Cl. 347-244.000.
Tatsumi, Fujiko: *See—*
  Takanashi, Itsuo; Nakagaki, Shintaro; Negishi, Ichiro; Suzuki, Tetsuji; Tatsumi, Fujiko; Takahashi, Ryusaku; and Maeno, Keiichi, 5,463,468, Cl. 358-296.000.
Taub, Karl D.: *See—*
  Driscoll, Mary E.; and Taub, Karl D., 5,462,235, Cl. 241-30.000.
Tayco Developments, Inc.: *See—*
  Taylor, Douglas P., 5,462,141, Cl. 188-280.000.
Tayloe, Daniel R., to Motorola, Inc. Method and apparatus for synchronizing to a multi-beam satellite TDMA communication system. 5,463,400, Cl. 342-352.000.
Taylor, Dennis K.: *See—*
  Barton, Derek H. R.; Parekh, Shyamal I.; Taylor, Dennis K.; and Tse, Chi-lam, 5,463,089, Cl. 549-458.000.
Taylor, Donald E.: *See—*
  Rodhall, Arne; and Taylor, Donald E., 5,463,595, Cl. 367-93.000.
Taylor, Donald M. Cardboard spacer/seal as thermal insulator. 5,461,840, Cl. 52-786.130.
Taylor, Douglas P., to Tayco Developments, Inc. Seismic isolator and method for strengthening structures against damage from seismic forces. 5,462,141, Cl. 188-280.000.
Taylor, Evelyn J.: *See—*
  LeFiles, James H.; Taylor, Evelyn J.; and Crawford, Mark A., 5,462,738, Cl. 424-409.000.
Taylor, Herbert H.; and Kaba, James T. C., to David Sarnoff Research Center, Inc. Method and apparatus for accessing a distributed data buffer. 5,463,732, Cl. 395-163.000.
Taylor, Jack. Grass trimming device for pop-up sprinklers. 5,461,788, Cl. 30-300.000.
Taylor, John E.: *See—*
  Coy, David H.; and Taylor, John E., 5,462,926, Cl. 514-16.000.
Taylor, Julian S.; and Rooney, Christopher F. Selector relief valve assembly. 5,462,086, Cl. 137-865.000.
Taylor, William L.: *See—*
  Lutz, Dale R.; MacDougall, Trevor W.; Taylor, William L.; Varner, Wayne F.; and Wandmacher, Robert A., 5,463,312, Cl. 324-96.000.
Taylor-Merrill, Jacqueline M.: *See—*
  Merrill, Warren R., Jr.; and Taylor-Merrill, Jacqueline M., 5,462,133, Cl. 182-172.000.
Tazoe, Haruo: *See—*
  Yamazaki, Hiraku; Sugai, Teruo; Kato, Shigeo; Tazoe, Haruo; Hotate, Shiroh; and Goto, Iwao, 5,462,800, Cl. 428-408.000.
TDK Corporation: *See—*
  Kurihara, Makoto; and Wasaki, Masaru, 5,463,287, Cl. 315-308.000.
  Shinjo, Teruya; Yamamoto, Hidefumi; Anno, Toshihiko; and Takada, Toshio, 5,462,795, Cl. 428-332.000.
TDW Delaware, Inc.: *See—*
  Banik, Niranjan; Land, Harry M.; and Levy, Edward W., 5,461,746, Cl. 15-104.061.
Technology Development Center: *See—*
  Simpson, John B.; and Anderson, Scott C., 5,462,529, Cl. 604-101.000.
Teijin Chemicals, Ltd.: *See—*
  Tokuda, Toshimasa; Furukawa, Ikkoh; and Miyauchi, Masayoshi, 5,463,013, Cl. 528-196.000.
Teijin Ltd.: *See—*
  Chujo, Takao; Hamano, Hisashi; Nishiyama, Masanori; Saeki, Yasuhiro; Ogawa, Tatsuya; and Endou, Kouhei, 5,463,015, Cl. 528-308.200.
  Mikoshiba, Yoshihisa; Adachi, Teruhiko; and Tajiri, Kouji, 5,462,802, Cl. 428-376.000.
  Sumi, Yoshihiko; Ichikawa, Yataro; Aoki, Nobuo; and Muramatsu, Masami, 5,463,025, Cl. 530-380.000.
Tektronix, Inc.: *See—*
  Karandikar, B. M.; Bui, Loc V.; and Le, Hue P., 5,462,591, Cl. 106-20.00R.
Telefonaktiebolaget L M Ericsson: *See—*
  Diec, Stephanie; and Karlsson, Lars G., 5,463,731, Cl. 395-161.000.
Temple, Stephen; and Shepherd, Mark R., to Xaar Limited. Multi-channel array droplet deposition apparatus. 5,463,414, Cl. 347-68.000.
Temple, Victor A. K., to Harris Corporation. Fast turn on switch circuit with parallel MOS controlled thyristor and silicon controlled rectifier. 5,463,344, Cl. 327-374.000.
Tench, Robert J.; Siekhaus, Wigbert J.; Balooch, Mehdi; Balhorn, Rodney L.; and Allen, Michael J., to University of California, Regents of the. Imaging, cutting, and collecting instrument and method. 5,461,907, Cl. 73-105.000.
Teng, Edward; and Eltoukhy, Atef H., to StorMedia, Inc. Flash chromium interlayer for improved hard disk magnetic recording performance. 5,462,796, Cl. 428-336.000.
Ten Hoeve, Wolter; Thiecke, Jantje R. G.; Wynberg, Hans; and Kruse, Chris G., to Duphar International Research, B.V. Method of preparing aryl(homo)piperazines. 5,463,050, Cl. 540-575.000.
Tennessee Valley Authority: *See—*
  Rizk, Tony A.; and Hauser, Gary E., 5,462,657, Cl. 210-170.000.
Terao, Kazuhiko; Iida, Hidetoku; Nakayama, Takeyasu; Kubo, Toshiya; Horigome, Jiro; Matsuoka, Yoshihiro; Takeda, Nobutoshi; and Mizuhashi, Tohru, to Totoku Electric Co., Ltd.; and Emit Seiko Co., Ltd. End-face polished ferrule and its method of manufacture. 5,463,709, Cl. 385-85.000.
Teraoka, Masao; Ochiai, Tomiaki; and Hasegawa, Mitsuru, to Tochigi Fugi Sangyo Kabushiki Kaisha. Supercharging device. 5,462,035, Cl. 123-561.000.
Terasaki, Masatoshi, to Hitachi, Ltd. Compression refrigerating machine. 5,461,883, Cl. 62-469.000.
Terashita, Takaaki; and Nakamura, Hiroaki, to Fuji Photo Film Co., Ltd. Methods of collecting photometric image data and determining light exposure by extracting feature image data from an original image. 5,463,470, Cl. 358-298.000.
Teva Pharmaceutical Industries, Ltd.: *See—*
  Vogel, Calvin, 5,463,040, Cl. 536-124.000.
Texaco Inc.: *See—*
  Kuhlmann, Erven J.; Pascoe, James R.; and Thom, Christopher J., 5,463,160, Cl. 585-671.000.
  Sudhakar, Chakka; Dolfinger, Frank, Jr.; Cesar, Max R.; Patel, Mahendra S.; and Fritz, Paul O., 5,462,651, Cl. 208-143.000.
Texaco Limited: *See—*
  Baker, Peter, 5,461,904, Cl. 73-46.000.
Texas A & M University System: *See—*
  Hall, Kenneth R.; Morrison, Gerald L.; and Holste, James C., 5,461,932, Cl. 73-861.610.
Texas Instruments Incorporated: *See—*
  Chisholm, Michael F.; and Forehand, David I., 5,462,882, Cl. 437-5.000.
  Heaton, Dale A., 5,463,359, Cl. 333-32.000.
  Ikeya, Kiyokazu, 5,462,446, Cl. 439-264.000.
  Johnson, Douglas A., 5,463,778, Cl. 395-775.000.
  Jones, Steven C.; Mukherjee, Subhashish; and Kwan, Stephen C., 5,463,347, Cl. 330-253.000.

  Matthews, Mark D.; and Brown, Louanne K., 5,462,639, Cl. 156-662.100.
Textilma AG: *See—*
  Skalka, Ivan, 5,462,097, Cl. 139-455.000.
Textron Inc.: *See—*
  Goss, David, 5,461,952, Cl. 81-460.000.
Thacker, Susan A.: *See—*
  Wang, Nai-Yi; Dubler, Robert E.; Ungemach, Frank S.; Walters, Roland L.; and Thacker, Susan A., 5,463,027, Cl. 530-388.900.
Thatcher, William B.: *See—*
  Schutte, Mark E.; Thatcher, William B.; and West, Lamar E., 5,463,689, Cl. 380-7.000.
Theobald, Leonard, to International Computers Limited. Design automation method for digital electronic circuits. 5,463,562, Cl. 364-489.000.
Theraposture Limited: *See—*
  Pearson, Stephen, 5,461,740, Cl. 5-611.000.
Thermal Dynamics, Inc.: *See—*
  Simonds, Edward L., 5,461,863, Cl. 60-676.000.
Thermo King Corporation: *See—*
  Sem, Thomas R., 5,462,658, Cl. 210-172.000.
  Walrath, Craig D.; and Arnts, James V., 5,463,402, Cl. 342-359.000.
Theys, Ezra E.: *See—*
  Bacchetti, Mark R.; Heiskell, Ronald E.; and Theys, Ezra E., 5,462,220, Cl. 229-112.000.
Thiecke, Jantje R. G.: *See—*
  Ten Hoeve, Wolter; Thiecke, Jantje R. G.; Wynberg, Hans; and Kruse, Chris G., 5,463,050, Cl. 540-575.000.
Thiele, Karl E.: *See—*
  Hunt, Thomas J.; Herrick, Benjamin M.; Robertson, Kimberly K.; Thiele, Karl E.; and Ziel, J. Mark, 5,462,057, Cl. 128-661.010.
Thiele, Martin, to International Business Machines Corporation. Process for fabrication of thin film magnetic heads. 5,462,637, Cl. 216-22.000.
Thiruppathi, Devaraj. Bookmark. 5,462,006, Cl. 116-234.000.
Tholander, Lars H. G.: *See—*
  Josefsson, Paer; Jacobsson, Kurt A. G.; and Tholander, Lars H. G., 5,462,094, Cl. 139-194.000.
Thom, Christopher J.: *See—*
  Kuhlmann, Erven J.; Pascoe, James R.; and Thom, Christopher J., 5,463,160, Cl. 585-671.000.
Thomas & Betts Corporation: *See—*
  Dumont, Kenneth R.; O'Neill, Andrew J.; and Davies, Scott T., 5,463,706, Cl. 385-32.000.
Thomas, Dean A.: *See—*
  Street, David G.; Paff, Thomas J.; Thomas, Dean A.; and McGlynn, Joseph P., 5,462,316, Cl. 285-81.000.
Thomas, Gerald S., to Lucas Industries plc. Spill valve for a fuel pump. 5,462,252, Cl. 251-25.000.
Thomason, Terry B.: *See—*
  Powell, Joseph B.; Slaugh, Lynn H.; Forschner, Thomas C.; Thomason, Terry B.; Semple, Thomas C.; Weider, Paul R.; and Arhancet, Juan P., 5,463,144, Cl. 568-867.000.
Thomason, Terry D.: *See—*
  Small, Edith M.; Prisby, Michael V.; and Thomason, Terry D., 5,462,622, Cl. 156-245.000.
Thompson, Bruce A.; Van Maren, David J.; McCarthy, John G.; Purcell, R. Andrew; and Rottinghaus, Michael, to Hewlett-Packard Company. Transparent peripheral file systems with on-board compression, decompression, and space management. 5,463,772, Cl. 395-600.000.
Thompson International: *See—*
  Beam, Jeffrey, 5,461,779, Cl. 29-894.381.
Thompson, Michael C. Method and apparatus for transporting material. 5,461,874, Cl. 62-60.000.
Thompson, Richard D.: *See—*
  Iyer, Subramanian S.; Thompson, Richard D.; and Tu, King-Ning, 5,463,254, Cl. 257-757.000.
Thomson Consumer Electronics, Inc.: *See—*
  Fitzgerald, William V., 5,463,290, Cl. 315-411.000.
  George, John B.; and Smith, Lawrence E., 5,463,288, Cl. 315-382.000.
  Tults, Juri, 5,463,423, Cl. 348-465.000.
Thomson-Csf: *See—*
  Valet, Thierry; and Tyc, Sté, 5,463,516, Cl. 360-113.000.
Thornburg, Theodore S.: *See—*
  Serad, George A.; and Thornburg, Theodore S., 5,462,973, Cl. 521-62.000.
Three Bond Company, Ltd.: *See—*
  McGinniss, Vincent D.; Bunk, Albert R.; and Mikuni, Hiroyuki, 5,462,696, Cl. 252-500.000.
Thuer, Walter, to MAN Roland Druckmaschinen AG. Paper reel, paper reel unpacking station for unpacking the paper reel, and process for unpacking the paper reel. 5,462,165, Cl. 206-410.000.
Thurkauf, Andrew; and Hutchison, Alan, to Neurogen Corporation. Certain aryl fused pyrrolopyrimidines; a new class of GABA brain receptor ligands. 5,463,054, Cl. 544-250.000.
Tijani, Amina: *See—*
  Togni, Antonio; Spindler, Felix; Zanetti, Nadia; and Tijani, Amina, 5,463,097, Cl. 556-14.000.
Tillmann, Horst; Jentsch, Dietrich; Hering, Thomas; Warschewitz, Thomas; Sichelschmidt, Dieter; and Winkler, Bernd, to DORMA GmbH + Co. KG. Door closer with a detent for holding a door open and the detent therefor. 5,461,754, Cl. 16-82.000.
Tilman, Paul A.; Scott, Richmond M.; and Machacek, Zdenek, to Minigrip, Inc. Stabilizing wedge zipper with high melt index interlayer. 5,462,360, Cl. 383-63.000.
Time Warner Entertainment Co., L.P.: *See—*
  Cookson, Christopher J.; and Ostrover, Lewis S., 5,463,565, Cl. 364-514.00R.
Timken Company, The: *See—*
  Davidson, Rickie L.; and Williams, Samuel R., 5,462,367, Cl. 384-459.000.
  Moog, John F.; and Strauser, Buford R., 5,462,171, Cl. 206-592.000.
Tinsley, Frank C.: *See—*
  Jones, Charles D.; and Tinsley, Frank C., 5,462,949, Cl. 514-324.000.
Tisdale, Stephen L.: *See—*
  Viehbeck, Alfred; Goldberg, Martin; Tisdale, Stephen L.; Buchwalter, Stephen L.; Grebe, Kurt R.; Kovac, Caroline A.; and Matthew, Linda C., 5,462,628, Cl. 156-281.000.
Tochigi Fugi Sangyo Kabushiki Kaisha: *See—*
  Teraoka, Masao; Ochiai, Tomiaki; and Hasegawa, Mitsuru, 5,462,035, Cl. 123-561.000.
Toda, Junzo; and Aoyama, Susumu, to Fujitsu Limited. Magnetoresistance head having a regularly-shaped gap. 5,463,517, Cl. 360-113.000.
Toda, Masataka; and Suganuma, Hiroyuki, to Aisin Seiki Kabushiki Kaisha. Apparatus for detecting an edge of an image. 5,463,697, Cl. 382-199.000.
Toda, Tsuyoshi: *See—*
  Kirino, Fumiyoshi; Saito, Atsushi; Toda, Tsuyoshi; Ide, Hiroshi; Tsuchinaga, Hiroyuki; Maeda, Takeshi; and Kugiya, Fumio, 5,463,600, Cl. 369-13.000.
Todd, Stephen J. P., to International Business Machines Corporation. System and method for controlling data storage in a data processing system in which objects generated within a lower level language program are associated with memory slots allocated to another program. 5,463,770, Cl. 395-600.000.
Todokoro, Hideo: *See—*
  Otaka, Tadashi; Mori, Hiroyoshi; and Todokoro, Hideo, 5,463,221, Cl. 250-310.000.
Togano, Takeshi: *See—*
  Kosaka, Yoko; Takiguchi, Takao; Iwaki, Takashi; Togano, Takeshi; Nakamura, Shinichi; and Nakazawa, Ikuo, 5,462,694, Cl. 252-299.610.
Togashi, Akio: *See—*
  Kobuke, Yoshiaki; Togashi, Akio; Ozawa, Masaki; and Watanabe, Masayuki, 5,463,099, Cl. 556-117.000.
Togashi, Shigemi: *See—*
  Isobe, Minoru; Yoshimura, Koutaro; and Togashi, Shigemi, 5,462,375, Cl. 400-680.000.
Togni, Antonio; Spindler, Felix; Zanetti, Nadia; and Tijani, Amina, to Ciba-Geigy Corporation. Ferrocenyl diphosphines as ligands for homogeneous catalysts. 5,463,097, Cl. 556-14.000.
Tokai Corporation: *See—*
  Nitta, Tomio; Mifune, Hideo; Seki, Masato; Kaga, Yosimitu; and Serizawa, Noriyuki, 5,462,044, Cl. 126-262.000.
Tokuda, Toshimasa; Furukawa, Ikkoh; and Miyauchi, Masayoshi, to Teijin Chemicals, Ltd. Modified aromatic polycarbonate resin, modified aromatic polyester carbonate resin, modified polyarylate, and molded articles therefrom. 5,463,013, Cl. 528-196.000.
Tokunaga, Osamu: *See—*
  Enoki, Masatoshi; Tokunaga, Osamu; Yamato, Shinichi; and Imazono, Masahiko, 5,462,224, Cl. 236-12.130.
Tokunaga, Tadayuki: *See—*
  Okada, Jouji; Kawamata, Akira; Tokunaga, Tadayuki; Torizuka, Makoto; and Asahi, Masahiko, 5,463,009, Cl. 528-15.000.
Tokuyama Corporation: *See—*
  Kobayakawa, Takashi; Imura, Satoshi; Itonaga, Kazumasa; and Kuramoto, Kazuhiko, 5,462,698, Cl. 252-586.000.
Tokyo Electron Limited: *See—*
  Iwabuchi, Katsuhiko, 5,462,397, Cl. 414-222.000.
  Murakami, Seishi, 5,462,603, Cl. 118-719.000.
Tokyo Electron Tohoku Limited: *See—*
  Iwabuchi, Katsuhiko, 5,462,397, Cl. 414-222.000.
Toledo, Sergio E. M.: *See—*
  Sandoval, Guillermo C.; Toledo, Sergio E. M.; and Garcia, Martha T. Z., 5,463,125, Cl. 564-170.000.
Tomasella, Frank P.: *See—*
  Ogan, Marc; Tomasella, Frank P.; and Tu, Jan-I, 5,463,080, Cl. 548-545.000.
Tomioka, Isao; Nakano, Takeshi; Furukawa, Mikio; and Echigo, Yoshiaki, to Unitika Ltd. Granular material of polyimide precursor, mixture comprising the material and process for producing the material. 5,463,016, Cl. 528-353.000.
Tomiyama, Tetsuo: *See—*
  Umeda, Yasushi; Tomiyama, Tetsuo; Yoshikawa, Hiroyuki; and Koike, Yuichi, 5,463,545, Cl. 364-187.000.
Tomlin, Janet: *See—*
  Bogentoft, Conny; Carlsson, Anders; and Tomlin, Janet, 5,462,742, Cl. 424-439.000.
Tomoegawa Paper Co., Ltd.: *See—*
  Kubota, Hideyuki; Horiike, Mitsuaki; and Furukawa, Toshiharu, 5,462,830, Cl. 430-110.000.
Tompkins, Robert E.: *See—*

- Barnes, Michael S.; Keller, John H.; Logan, Joseph S.; Tompkins, Robert E.; and Westerfield, Robert P., Jr., 5,463,525, Cl. 361-234.000.
- Tomra Systems A/S: *See—*
  - Friis, Henrik, 5,462,153, Cl. 198-597.000.
- Tomzig, Erich; Wolf, Reinhard; and Hensel, Wolfgang, to Wacker-Chemitronic Gesellschaft für Elektronik-Grundstoffe mbH. Method for pulling single crystals. 5,462,011, Cl. 117-18.000.
- Tooher, Michael, to Alcatel N.V. Method of converting a parallel, time-division multiplexed data stream into individual serial data streams and vice versa, and converter therefor. 5,463,630, Cl. 370-112.000.
- Toray Industries, Inc.: *See—*
  - Kobayashi, Masanobu; Itoh, Motoi; Matsuhisa, Yoji; and Shimizu, Kazuharu, 5,462,799, Cl. 428-364.000.
  - Matsuki, Sadao; Motogi, Moriyuki; Nabeshima, Keitaro; and Kadowaki, Minoru, 5,462,790, Cl. 428-229.000.
- Torgerson, Beatrice A.: *See—*
  - Berglund, Kris A.; Dulebohn, Joel I.; and Torgerson, Beatrice A., 5,462,878, Cl. 436-131.000.
- Toriumi, Akira; Shigyo, Naoyuki; Wada, Tetsunori; Tanimoto, Hiroyoshi; Ohuchi, Kazuya; and Yoshimi, Makoto, to Kabushiki Kaisha Toshiba. High-speed semiconductor gain memory cell with minimal area occupancy. 5,463,234, Cl. 257-296.000.
- Torizuka, Makoto: *See—*
  - Okada, Jouji; Kawamata, Akira; Tokunaga, Tadayuki; Torizuka, Makoto; and Asahi, Masahiko, 5,463,009, Cl. 528-15.000.
- Törmä, to ABB Industry Oy. Slip compensation method in a squirrel cage induction motor. 5,463,302, Cl. 318-807.000.
- Tortolani, Anthony J.: *See—*
  - Powell, Saul R.; and Tortolani, Anthony J., 5,462,524, Cl. 604-52.000.
- Tosaka, Yasuo, to Konica Corporation. Light-sensitive silver halide color photographic material and process for preparing color proof. 5,462,844, Cl. 430-503.000.
- Toshiba Ceramics Co.: *See—*
  - Yamazaki, Hiraku; Sugai, Teruo; Kato, Shigeo; Tazoe, Haruo; Hotate, Shiroh; and Goto, Iwao, 5,462,800, Cl. 428-408.000.
- Toshiba Corporation: *See—*
  - Kashima, Toshihiro; Hoshino, Masayuki; Nakano, Masachika; and Hirano, Tokushiro, 5,462,791, Cl. 428-259.000.
- Tosi, Giuseppe: *See—*
  - Spada, Valter; and Tosi, Giuseppe, 5,461,841, Cl. 53-234.000.
- Tosoh Corporation: *See—*
  - Shinjo, Teruya; Yamamoto, Hidefumi; Anno, Toshihiko; and Takada, Toshio, 5,462,795, Cl. 428-332.000.
- Toto Ltd.: *See—*
  - Enoki, Masatoshi; Tokunaga, Osamu; Yamato, Shinichi; and Imazono, Masahiko, 5,462,224, Cl. 236-12.130.
- Totoku Electric Co., Ltd.: *See—*
  - Terao, Kazuhiko; Iida, Hidetoku; Nakayama, Takeyasu; Kubo, Toshiya; Horigome, Jiro; Matsuoka, Yoshihiro; Takeda, Nobutoshi; and Mizuhashi, Tohru, 5,463,709, Cl. 385-85.000.
- Towa Chemical Industry Co., Ltd.: *See—*
  - Niimi, Masahiro; Hariu, Yukari; Kataura, Koichi; Ishii, Yoshibumi; and Kato, Kazuaki, 5,462,864, Cl. 435-100.000.
- Toy, Steve, to NEC Electronics, Inc. Apparatus and method for measuring operating voltage electrical signals in a high voltage environment. 5,463,311, Cl. 324-96.000.
- Toyama, Masamichi: *See—*
  - Harigaya, Isao; Mogi, Hirokazu; Kozuki, Susumu; Iijima, Ryunosuke; Toyama, Masamichi; and Hirasawa, Masahide, 5,463,442, Cl. 354-400.000.
- Toyo Boseki Kabushiki Kaisha: *See—*
  - Isoda, Hideo; Hamaguchi, Tadaaki; Sakuda, Mitsuhiro; and Yamada, Yasushi, 5,462,793, Cl. 428-297.000.
  - Kashima, Toshihiro; Hoshino, Masayuki; Nakano, Masachika; and Hirano, Tokushiro, 5,462,791, Cl. 428-259.000.
- Toyota Chuo Kenkyusho Kabushiki Kaisha: *See—*
  - Nagami, Tetsuo; Ogura, Yoshitsugu; Ogai, Masahiko; Fukushima, Yoshiaki; Inagaki, Shinji; Fukumoto, Kazuhiro; Banno, Kouji; Sakakibara, Yuji; Takada, Yasuo; Ohta, Takashi; Okada, Akane; Yamada, Yukimura; Hayashi, Kiyotaka; Matsuura, Shinji; and Kuroda, Kaz, 5,462,905, Cl. 502-232.000.
- Toyota Jidosha Kabushiki Kaisha: *See—*
  - Hasegawa, Tamotsu; Arakawa, Yasuyuki; and Ota, Atushi, 5,462,107, Cl. 164-63.000.
  - Itou, Takaaki; Tanaka, Hiroshi; Takeda, Keiso; Ohnaka, Hidemi; Kunitake, Kazuhisa; and Tanahashi, Toshio, 5,461,857, Cl. 60-276.000.
  - Iwata, Yoichi, 5,461,902, Cl. 73-23.320.
  - Nagami, Tetsuo; Ogura, Yoshitsugu; Ogai, Masahiko; Fukushima, Yoshiaki; Inagaki, Shinji; Fukumoto, Kazuhiro; Banno, Kouji; Sakakibara, Yuji; Takada, Yasuo; Ohta, Takashi; Okada, Akane; Yamada, Yukimura; Hayashi, Kiyotaka; Matsuura, Shinji; and Kuroda, Kaz, 5,462,905, Cl. 502-232.000.
  - Yoshida, Hiroaki; Ohta, Masashi; and Nakamura, Akira, 5,462,343, Cl. 303-114.100.
- Toyota Metal Co., Ltd.: *See—*
  - Kumagai, Masakatsu; and Fujita, Yoshihisa, 5,462,172, Cl. 209-12.100.
- Toyota Tsusho Corporation: *See—*
  - Kumagai, Masakatsu; and Fujita, Yoshihisa, 5,462,172, Cl. 209-12.100.
- Tozyo, Takehiko: *See—*
  - Konoike, Toshiro; Araki, Yoshitaka; Hayashi, Tetsuyoshi; Sakurai, Kensuke; and Tozyo, Takehiko, 5,463,107, Cl. 560-43.000.
- Traber, Jörg: *See—*
  - Schohe, Rudolf; Glaser, Thomas; Traber, Jörg; and Allen, George S., 5,463,105, Cl. 560-29.000.
- Traenckner, Hans-Joachim: *See—*
  - Hagedorn, Ferdinand; Fiege, Helmut; and Traenckner, Hans-Joachim, 5,463,068, Cl. 548-152.000.
- Tramberger, Hermann: *See—*
  - Leitner, Harald; Wörther, Rudolf H.; Korntner, Horst; Schneider, Rudolf; Auer, Engelbert; Kores, Dietmar; and Tramberger, Hermann, 5,462,914, Cl. 504-238.000.
- Tramper, Douglas E.: *See—*
  - Zink, Robert M.; Bazany, Donald J.; and Tramper, Douglas E., 5,462,221, Cl. 229-117.160.
- Trattner, Burton C.; and LeMarr, Wes. Flashing light device. 5,463,537, Cl. 362-103.000.
- Traversari, Catia: *See—*
  - Boon-Falleur, Thierry; van der Bruggen, Pierre; De Plaen, Etienne; Lurquin, Christophe; Traversari, Catia; Gaugler, Beatrice; and Van den Eynde, Benoit, 5,462,871, Cl. 435-240.200.
- Traxler, Eva M.: *See—*
  - Pomroy, James F.; and Traxler, Eva M., 5,462,192, Cl. 220-526.000.
- Treffert, Jon D.: *See—*
  - Hawman, Peggy C.; Qian, Jianzhong; and Treffert, Jon D., 5,462,056, Cl. 128-659.000.
- Tremblay, Gilles, to Hydro-Quebec. Testing unit by which communication links can be selected and tested, and method thereof. 5,463,632, Cl. 371-20.100.
- Trigon Research & Development Co.: *See—*
  - Harlev, Amos, 5,463,597, Cl. 367-107.000.
- Trimmer, Charleen R. Animal tail cover. 5,462,020, Cl. 119-850.000.
- Triton Engineering Services Company: *See—*
  - Piers, George E., 5,462,673, Cl. 210-739.000.
- Trowbridge, Larry G. Jack stand. 5,462,257, Cl. 254-8.00B.
- Trubey, Bradley S.: *See—*
  - Smith, Jay L.; Trubey, Bradley S.; and Walker, Anthony D., 5,463,634, Cl. 371-20.600.
- Truckenbrod, Thomas G.; and Ramp, Benjamin E., to HCC Inc. Sieve apparatus for combine. 5,462,174, Cl. 209-394.000.
- True Fitness Technology Inc.: *See—*
  - Trulaske, Frank R.; and Singer, Phil M., 5,462,504, Cl. 482-7.000.
- Trueblood, John W., to Sony Electronics Inc. Perceptual based color-compression for raster image quantization. 5,463,702, Cl. 382-239.000.
- Trulaske, Frank R.; and Singer, Phil M., to True Fitness Technology Inc. Fitness apparatus with heart rate control system and method of operation. 5,462,504, Cl. 482-7.000.
- Trulli, Stephen: *See—*
  - Jonak, Zdenka L.; Debouck, Christine; Clark, Robert; and Trulli, Stephen, 5,462,872, Cl. 435-240.200.
- Trustees of Columbia University in the City of New York, The: *See—*
  - Landry, Donald W.; and Zhao, Kang, 5,463,028, Cl. 530-405.000.
- Trützschler GmbH & Co. KG: *See—*
  - Leifeld, Ferdinand, 5,461,757, Cl. 19-239.000.
- TRW Inc.: *See—*
  - Barcaskey, Eric S., 5,462,306, Cl. 280-736.000.
  - Chen, Chung-Hsu; and Yen, Huan-Chun, 5,463,275, Cl. 313-495.000.
- Tsai, Tung-Hung. Method for coating metal cookware. 5,462,769, Cl. 427-307.000.
- Tsai, Wen-Liang; and Lee, Chein-Dhau, to Industrial Technology Research Institute. Chiral liquid crystal materials as dopant for ferroelectric liquid crystal compositions. 5,462,695, Cl. 252-299.650.
- Tse, Chi-lam: *See—*
  - Barton, Derek H. R.; Parekh, Shyamal I.; Taylor, Dennis K.; and Tse, Chi-lam, 5,463,089, Cl. 549-458.000.
- Tseng, Chin-Tsun. Multi-functional automatic circular massaging device. 5,462,515, Cl. 601-57.000.
- Tseng, I. Grace: *See—*
  - Gaechter, Barbara I.; Sahni, Paramdeep S.; and Tseng, I. Grace, 5,463,685, Cl. 379-207.000.
- Tsuchida, Kazuhito, to Mitsubishi Denki Kabushiki Kaisha. CMOS input circuit. 5,463,330, Cl. 326-81.000.
- Tsuchinaga, Hiroyuki: *See—*
  - Kirino, Fumiyoshi; Saito, Atsushi; Toda, Tsuyoshi; Ide, Hiroshi; Tsuchinaga, Hiroyuki; Maeda, Takeshi; and Kugiya, Fumio, 5,463,600, Cl. 369-13.000.
- Tsuji, Kiyoaki: *See—*
  - Suzuki, Yuji; Shimizu, Hirohiko; Suzuki, Hiroyuki; and Tsuji, Kiyoaki, 5,463,509, Cl. 360-99.060.
- Tsuji, Sadafusa: *See—*
  - Shintani, Dai; Okada, Hiroyuki; Hoda, Takeo; Izumi, Shuji; Mukai, Hiromu; Hatamori, Osamu; and Tsuji, Sadafusa, 5,463,436, Cl. 354-81.000.
- Tsuji, Takashi: *See—*
  - Iino, Yukio; Ishii, Makoto; Ohsumi, Koji; and Tsuji, Takashi, 5,463,078, Cl. 548-541.000.
- Tsuji, Takeshi; and Saito, Masashi, to Sumitomo Wiring Systems, Ltd. Electrical connector with a function of detecting interfitting engagement of connector housings. 5,462,449, Cl. 439-188.000.
- Tsukada, Isamu: *See—*
  - Matsushima, Kiyomitsu; Odake, Hidekazu; Ohashi, Tamotsu; and Tsukada, Isamu, 5,462,154, Cl. 198-699.000.
- Tsukada, Masayuki: *See—*

- Hidano, Tetsuhiro; Takeda, Hiroyuki; Tsukada, Masayuki; Yamamoto, Kazuo; and Inoue, Atsushi, 5,463,038, Cl. 536-124.000.
- Tsukada, Michiko; and Matsuoka, Akio, to NEC Corporation. Method of fabricating a semiconductor device with a polycrystalline silicon resistive layer. 5,462,889, Cl. 437-60.000.
- Tsukahara, Satoshi: *See—*
  - Inoue, Hiroshi; Tsukahara, Satoshi; and Iwai, Kazumi, 5,461,855, Cl. 60-39.060.
- Tsukamoto, Shigemi: *See—*
  - Sato, Chuichi; Tsukamoto, Shigemi; and Shinno, Hidenori, 5,462,361, Cl. 384-9.000.
- Tsukida, Shinichi: *See—*
  - Inoue, Takahiro; Goto, Masahiro; Sasame, Hiroshi; Tsukida, Shinichi; and Takano, Manabu, 5,463,450, Cl. 355-219.000.
- Tsukiyama, Naohiro: *See—*
  - Imai, Keisuke; and Tsukiyama, Naohiro, 5,462,340, Cl. 297-478.000.
- Tsunoda, Kazuyuki; and Fujisawa, Ichiro, to NEC Corporation; and NTT Mobile Communication Network, Inc. Method of setting an inaudible alert mode in a radio pager. 5,463,368, Cl. 340-309.150.
- Tsuruoka, Ichiro: *See—*
  - Kurotori, Tsuneo; Mochizuki, Manabu; Ariyama, Kenzo; Kojima, Kenji; Tsuruoka, Ichiro; Echigo, Katsuhiro; Miyao, Mayumi; and Ikeda, Itsuo, 5,463,453, Cl. 355-256.000.
- Tsuruta, Haruki: *See—*
  - Yuasa, Yoshifumi; Okeda, Yoshiki; Tachikawa, Akio; Nagakura, Akira; and Tsuruta, Haruki, 5,463,118, Cl. 562-502.000.
- Tsushio, Yoshinori: *See—*
  - Minami, Takanori; Shiraishi, Noriaki; Shimizu, Tsutomu; Takamuku, Kenji; Tsushio, Yoshinori; Mizushima, Yoshio; Yoshimoto, Kazuyuki; and Kadokura, Masaki, 5,462,021, Cl. 123-3.000.
- Tu, Jan-I: *See—*
  - Ogan, Marc; Tomasella, Frank P.; and Tu, Jan-I, 5,463,080, Cl. 548-545.000.
- Tu, King-Ning: *See—*
  - Iyer, Subramanian S.; Thompson, Richard D.; and Tu, King-Ning, 5,463,254, Cl. 257-757.000.
- Tuason, Domingo C., Jr.: *See—*
  - McGinley, Emanuel J.; and Tuason, Domingo C., Jr., 5,462,761, Cl. 426-573.000.
- Tucker, Darryl W.: *See—*
  - D'Aleo, Michael J.; Ference, Jonathan H.; Hakkarainen, Simo P.; Spira, Joel S.; and Tucker, Darryl W., 5,463,286, Cl. 315-295.000.
- Tufts University: *See—*
  - Bachovchin, William W.; Plaut, Andrew G.; and Flentke George R., 5,462,928, Cl. 514-19.000.
- Tulane Educational Fund, Administrators of the: *See—*
  - Coy, David H.; and Taylor, John E., 5,462,926, Cl. 514-16.000.
- Tulane Educational Fund, The Administrators of the: *See—*
  - Moreau, Jacques-Pierre; and Coy, David H., 5,462,927, Cl. 514-17.000.
- Tuller, F. Norman: *See—*
  - Noack, Wolf-Eckart; Schulz, Paul; and Tuller, F. Norman, 5,463,114, Cl. 562-421.000.
- Tults, Juri, to Thomson Consumer Electronics, Inc. Auxiliary video data detector and data slicer. 5,463,423, Cl. 348-465.000.
- Tuma, John E.: *See—*
  - Bogle, Tom G.; Tuma, John E.; and Williams, Barry N., 5,461,906, Cl. 73-49.200.
- Turillo, Tommaso: *See—*
  - Buoli, Carlo; Mora, Giovanni; and Turillo, Tommaso, 5,463,360, Cl. 331-96.000.
- Turner, Josephine S.; Murray, D. Gary; Zuccolin, John D.; and Li, Ruey S., to Medipro Sciences Limited. Substance transfer system for topical application. 5,462,743, Cl. 424-448.000.
- Turner, Kenneth W.: *See—*
  - Covert, Charles H.; Wagner, Richard W.; Turner, Kenneth W.; and Meyer, Karen M., 5,462,100, Cl. 141-59.000.
- Twichell, Jonathan C.: *See—*
  - Geis, Michael W.; Macaulay, John M.; and Twichell, Jonathan C., 5,463,271, Cl. 313-346.00R.
- Tyagi, Dinesh; and Sorriero, Louis J., to Eastman Kodak Company. Polymer blends and toner compositions comprising same. 5,462,829, Cl. 430-109.000.
- Tyburski, Robert M., to Mitron Systems Corporation. Roadway sensor systems. 5,463,385, Cl. 340-933.000.
- Tyc, Sté: *See—*
  - Valet, Thierry; and Tyc, Sté, 5,463,516, Cl. 360-113.000.
- Tyler, Arthur W., to CNC Corporation. Method and apparatus for bending steel rule. 5,461,893, Cl. 72-7.000.
- Ube Industries, Ltd.: *See—*
  - Nishihira, Keigo; and Tanaka, Shuji, 5,463,109, Cl. 560-157.000.
  - Shinjo, Teruya; Yamamoto, Hidefumi; Anno, Toshihiko; and Takada, Toshio, 5,462,795, Cl. 428-332.000.
- Uchida, Hiroyuki, to Fanuc, Ltd. Rotor for synchronous motor. 5,463,262, Cl. 310-156.000.
- Uchiyama, Seiji; Noguchi, Akio; Ushio, Yukihide; Matsuo, Shinpei; Serizawa, Youji; Takeuchi, Makoto; Yamada, Kazurou; and Kato, Junichi, to Canon Kabushiki Kaisha. Image recording apparatus using optical beam. 5,463,410, Cl. 347-133.000.
- Uchiyama, Takako; and Higuchi, Hirofumi, to Mitsubishi Gas Chemical Company, Inc. Process for producing α-hydroxyisobutyramide. 5,463,123, Cl. 564-126.000.
- Udo, Satoru: *See—*
  - Maeda, Takashi; Furukido, Takeshi; Hoshino, Kousaku; Udo, Satoru; and Izumi, Masayoshi, 5,462,291, Cl. 277-100.000.
- Uematsu, Yoshihiro; Hiramatsu, Naoto; and Oku, Manabu, to Nisshin Steel Co., Ltd. Ferritic stainless steel excellent in high temperature oxidation resistance and scale adhesion. 5,462,611, Cl. 148-325.000.
- Uesugi, Akio: *See—*
  - Sawada, Hirokazu; Uesugi, Akio; and Matsuki, Masaya, 5,462,614, Cl. 148-551.000.
- Uitenbroek, Duane G.: *See—*
  - Bruemmer, Mary A.; Rosch, Paulette M.; Vukos, John P.; Uitenbroek, Duane G.; Zehner, Georgia L.; and Rasmussen, Christine A., 5,462,541, Cl. 604-391.000.
- Ulrich, W. Thatcher: *See—*
  - Benjamin, Michael H.; Bobick, Aaron F.; Koselka, Harvey A.; and Ulrich, W. Thatcher, 5,462,503, Cl. 482-4.000.
- Umeda, Yasushi; Tomiyama, Tetsuo; Yoshikawa, Hiroyuki; and Koike, Yuichi, to Mita Industrial Co., Ltd. Functional redundancy control system. 5,463,545, Cl. 364-187.000.
- Umemura, Masaya; Ogura, Toshihiko; Osaka, Hideki; and Shinozaki, Masatsugu, to Hitachi, Ltd. Module for information processing apparatus using stacked printed circuit boards and connector for stacking printed circuit boards. 5,462,442, Cl. 439-69.000.
- Umezawa, Kazuhiko, to NEC Corporation. Cooling structure for integrated circuits. 5,463,528, Cl. 361-699.000.
- Ungemach, Frank S.: *See—*
  - Wang, Nai-Yi; Dubler, Robert E.; Ungemach, Frank S.; Walters, Roland L.; and Thacker, Susan A., 5,463,027, Cl. 530-388.900.
- Unilever Patent Holdings B.V.: *See—*
  - Lok, Cornelis M., 5,463,096, Cl. 554-146.000.
- Union Oil Company of California: *See—*
  - Gallup, Darrell L.; Featherstone, John L.; and Flint, Carl E., 5,462,668, Cl. 210-696.000.
- Unisia Jecs Corporation: *See—*
  - Kumagai, Masato, 5,462,026, Cl. 123-396.000.
- Unisys Corporation: *See—*
  - Morrissey, Douglas E.; Cavanagh, Edward T., Jr.; and Ng, Kin H., 5,463,762, Cl. 395-185.020.
  - Rodi, EuGene A.; Price, Ferris T., deceased, 5,463,644, Cl. 371-40.400.
  - Stevens, Rick, 5,463,486, Cl. 359-117.000.
- United Coatings, Inc.: *See—*
  - Gatlin, Noel A., 5,462,353, Cl. 366-209.000.
- United Laboratories, Inc.: *See—*
  - Mestetsky, Pat A.; and Davis, Robert E., 5,462,607, Cl. 134-22.120.
- United Microelectronics Corp.: *See—*
  - Wu, Chyi-Chang, 5,463,386, Cl. 341-26.000.
- United Parcel Service of America, Inc.: *See—*
  - Bonnet, Henri, 5,462,400, Cl. 414-796.500.
- United States of America
  - Agriculture: *See—*
    - Brogden, Kim A.; and Chedid, Louis, 5,462,735, Cl. 424-255.100.
    - Singleton, John A.; and Stikeleather, Larry F., 5,462,660, Cl. 210-198.200.
    - Slavicek, James M.; and Mercer, Melissa J., 5,462,732, Cl. 424-93.200.
  - Air Force: *See—*
    - Pan, Jing-Jong, 5,463,647, Cl. 372-12.000.
  - Army: *See—*
    - Plichta, Edward J.; and Behl, Wishvender K., 5,462,818, Cl. 429-104.000.
  - Commerce: *See—*
    - Stansbury, Jeffrey W., 5,463,008, Cl. 526-268.000.
  - Energy: *See—*
    - Kronberg, James W., 5,463,377, Cl. 340-605.000.
  - Health and Human Services: *See—*
    - Daly, John W.; Spande, Thomas F.; and Garraffo, Hugo M., 5,462,956, Cl. 514-397.000.
    - Garfinkel, David J.; and Curcio, M. Joan, 5,462,873, Cl. 435-254.200.
    - Mitchell, James B.; Samuni, Amram; DeGraff, William; and Hahn, Stephen, 5,462,946, Cl. 514-315.000.
  - Navy: *See—*
    - Bobb, Lloyd C.; and Krumboltz, Howard D., 5,461,926, Cl. 73-800.000.
    - Bobb, Lloyd C.; and Krumboltz, Howard D., 5,461,927, Cl. 73-800.000.
    - Griffin, Maurice J.; and Sugawara, Glenn S., 5,463,334, Cl. 327-106.000.
    - Holmes, John J.; and Lackey, Milton H., 5,463,523, Cl. 361-149.000.
    - Kretschmer, Frank F., Jr., 5,463,399, Cl. 342-132.000.
    - Lewis, Bernard L., 5,463,396, Cl. 342-15.000.
    - Nedderman, William H., Jr.; and Meunier, Robert, 5,462,000, Cl. 114-249.000.
  - Secretary, DHHS: *See—*
    - Arthur, Larry O.; and Henderson, Louis E., 5,462,852, Cl. 435-5.000.
- U.S. Philips Corporation: *See—*
  - Bergmans, Johannes W. M., 5,463,654, Cl. 375-341.000.
  - Cloetens, Henri, 5,463,640, Cl. 371-37.100.
  - Hendrix, Machiel A. M., 5,463,282, Cl. 315-209.00R.
  - Jordan, Hermann; Krammer, Erich; Rogatschnig, Johann T.; Den Ouden, Petronella H.; and Span, Francis J., 5,462,557, Cl. 606-133.000.
  - Linssen, Henricus M. H., 5,463,281, Cl. 315-209.00R.

  - Muhlemann, Kurt, 5,463,239, Cl. 257-355.000.
  - Roth, Rudolf; and Van Offenbeek, Johannes C., 5,463,607, Cl. 369-60.000.
  - Van Berkel, Cornelis, 5,463,216, Cl. 250-208.100.
  - Vorenkamp, Pieter; and Verdaasdonk, Johannes P. M., 5,463,308, Cl. 323-312.000.
  - van Steenbrugge, Bernard; de Leeuw, Henricus; and Mastroyiannis, Mihalis, 5,463,619, Cl. 370-58.100.
- United States Surgical Corporation: *See*—
  - Alesi, Thomas W., Jr., 5,462,542, Cl. 606-151.000.
  - Bolanos, Henry; Sater, Ghaleb A.; DeFonzo, Stephan A.; and Young, Wayne P., 5,462,555, Cl. 606-120.000.
  - Brown, David L., 5,461,844, Cl. 53-449.000.
  - Colligan, Francis D., 5,462,543, Cl. 606-1.000.
  - Kaplan, Donald S.; Hermes, Matthew E.; Muth, Ross R.; Brown, David L.; and Holzwarth, Henry A., 5,462,162, Cl. 206-339.000.
  - Kolesa, Michael S.; Mastri, Dominick L.; Young, Wayne P.; and Bolanos, Henry, 5,462,558, Cl. 606-139.000.
  - Viola, Frank J.; Green, David T.; and Bolanos, Henry, 5,462,215, Cl. 227-176.000.
- United Technologies Corporation: *See*—
  - Hoff, Richard W.; and Martin, David R., 5,462,405, Cl. 416-97.00R.
  - Pannone, John L., 5,462,403, Cl. 415-173.100.
  - Smith, Dale E.; and Chase, Edward W., III, 5,462,410, Cl. 416-165.000.
  - Snyder, Timothy S.; Rosfjord, Thomas J.; McVey, John B.; Hu, Aaron S.; and Schlein, Barry C., 5,461,865, Cl. 60-737.000.
  - Sullivan, Dennis J.; Butler, Aaron S.; and Kelley, Mark A., 5,461,866, Cl. 60-757.000.
  - Zywiak, Thomas M., 5,461,882, Cl. 62-401.000.
- Unitika Ltd.: *See*—
  - Tomioka, Isao; Nakano, Takeshi; Furukawa, Mikio; and Echigo, Yoshiaki, 5,463,016, Cl. 528-353.000.
- Univenture, Inc.: *See*—
  - Youngs, Ross O., 5,462,160, Cl. 206-312.000.
- Universal Design: *See*—
  - Booher, Benjamin V., 5,462,620, Cl. 156-180.000.
- Universite de Neuchatel: *See*—
  - de Rooij, Nicolaas Frans; Jeanneret, Sylvain; Gass, Volker; and van der Schoot, Bart, 5,462,839, Cl. 430-320.000.
- Universities Research Association, Inc.: *See*—
  - Darimont, Daniel E., 5,463,196, Cl. 200-43.160.
- University of California, Regents of the: *See*—
  - Tench, Robert J.; Siekhaus, Wigbert J.; Balooch, Mehdi; Balhorn, Rodney L.; and Allen, Michael J., 5,461,907, Cl. 73-105.000.
- University of California, The Regeants of the: *See*—
  - Kossovsky, Nir; Hnatyszyn, H. James; and Gelman, Andrew, 5,462,751, Cl. 424-494.000.
- University of California, The Regents of the: *See*—
  - Berkowitz, Ami, 5,462,809, Cl. 428-546.000.
  - Ferrara, Katherine W.; and Algazi, V. Ralph, 5,462,059, Cl. 128-661.090.
  - Kossovsky, Nir; and Bunshah, Rointan F., 5,462,750, Cl. 424-493.000.
  - Zumberge, Mark A.; Canuteson, Eric L.; and Parker, Paul R., 5,461,914, Cl. 73-382.00R.
- University of Florida: *See*—
  - Briggs, Richard W.; and Wu, Zhen, 5,462,053, Cl. 128-653.400.
- University of Florida Research Foundation, Inc.: *See*—
  - Bergeron, Raymond J., Jr.; and Sninsky, Charles A., 5,462,970, Cl. 514-654.000.
- University of Houston-University Park: *See*—
  - Salama, Kamel; and Selvamanickam, Venkatakrishnan, 5,462,917, Cl. 505-150.000.
- University of Iowa Research Foundation: *See*—
  - Campbell, Kevin P.; Knudson, C. Michael; Kahl, Steven D.; Louis, Charles F.; and Mickelson, James R., 5,462,857, Cl. 435-7.210.
- University of Nebraska, Board of Regents of the: *See*—
  - Rieke, Reuben D., 5,463,018, Cl. 528-373.000.
- University of Tokyo, The: *See*—
  - Masumi, Taizo, 5,462,916, Cl. 505-182.000.
- University of Virginia Patent Foundation: *See*—
  - Rijke, Arie M.; and Goitz, Henry T., 5,462,068, Cl. 128-881.000.
- Uno, Hiroaki: *See*—
  - Maruyama, Takumi; Onodera, Takashi; Hatakenaka, Nobuko; Uno, Hiroaki; and Yokoshi, Noriyuki, 5,463,663, Cl. 375-356.000.
- Unverferth Manufacturing Co., Inc.: *See*—
  - Rawson, Ray, 5,462,124, Cl. 172-569.000.
- UOP: *See*—
  - Frey, Stanley J., 5,463,134, Cl. 568-59.000.
  - Gajda, Gregory J.; and Barger, Paul T., 5,463,161, Cl. 585-671.000.
  - Galperin, Leonid B.; Bricker, Jeffery C.; and Holmgren, Jennifer S., 5,463,155, Cl. 585-310.000.
  - Wegerer, David A., 5,462,652, Cl. 208-167.000.
- Upjohn Company, The: *See*—
  - Svensson, Kjell A. I.; Wikstrom, Hakan V.; Carlsson, Per A. E.; Boije, Anna M. P.; Waters, R. Nicholas; Sonesson, Clas A.; Stjernlof, Nils P.; Andersson, Bengt R.; and Hansson, Lars O., 5,462,947, Cl. 514-317.000.
- Upper, Gerd: *See*—
  - Hering, Jürgen; Johnen, Rolf; and Upper, Gerd, 5,462,287, Cl. 277-37.000.
  - Hering, Jürgen; Johnen, Rolf; and Upper, Gerd, 5,462,288, Cl. 277-37.000.
- Upton, Winfred R., to Jesuit Community at Loyola University. Adjustable pedal extension. 5,461,939, Cl. 74-562.500.
- Uragami, Akira: *See*—
  - Kimura, Hiroshi; Miyazawa, Shoichi; Horita, Ryutaro; Hase, Kenichi; Hirano, Akihiko; and Uragami, Akira, 5,463,504, Cl. 360-65.000.
- Urakawa, Mitsuaki: *See*—
  - Kurotori, Tsuneo; Echigo, Katsuhiro; Urakawa, Mitsuaki; Mizuno, Hisamitsu; and Hibi, Kunio, 5,463,447, Cl. 355-202.000.
- Uramoto, Shinichi: *See*—
  - Takabatake, Akihiko; Uramoto, Shinichi; and Nakagawa, Shinichi, 5,463,340, Cl. 327-211.000.
- Urruela, Jose R.: *See*—
  - Mendia, Jose I. I.; and Urruela, Jose R., 5,461,856, Cl. 60-230.000.
- Urso, Thomas S., Jr.: *See*—
  - Morduch, Georg E.; Parkinson, Alvin O.; and Urso, Thomas S., Jr., 5,463,684, Cl. 379-202.000.
- Ushida, Masayasu, to Nippondenso Co., Ltd. Valve timing control apparatus having cylinder discriminating function. 5,462,022, Cl. 123-90.170.
- Ushio, Yukihide: *See*—
  - Uchiyama, Seiji; Noguchi, Akio; Ushio, Yukihide; Matsuo, Shinpei; Serizawa, Youji; Takeuchi, Makoto; Yamada, Kazurou; and Kato, Junichi, 5,463,410, Cl. 347-133.000.
- Usui, Katumi: *See*—
  - Sano, Akira; Shiraishi, Takeichi; Suzuki, Kunihiro; Okamoto, Mitsuo; Usui, Katumi; Shimizu, Hiroyuki; and Matsuura, Kazuo, 5,463,001, Cl. 526-124.500.
- Utter, Robert E.: *See*—
  - Hill, Joe T.; Williams, John R.; and Utter, Robert E., 5,462,419, Cl. 418-55.400.
- VAE Eisenbahnststeme Aktiengesellschaft: *See*—
  - Durchschlag, Gerald, 5,462,245, Cl. 246-448.000.
- Vaiana, Joseph: *See*—
  - Stern, Howard; Yonescu, William; Vaiana, Joseph; and Mauro, Alex, 5,463,227, Cl. 250-559.290.
- Vaios, Christos I.; Malinowski, Alan E.; and Diliani, Dimitri N., to AT&T Corp. Security system for terminating fraudulent telephone calls. 5,463,681, Cl. 379-189.000.
- Vairavan, Vairavan: *See*—
  - Pascucci, Gregory A.; Rasmussen, David E.; Decious, Gaylon M.; Garbe, James R.; Hyzer, Susan M.; Woest, Karen L.; Vairavan, Vairavan; Koch, David L.; Gottschalk, Donald A., Jr.; Burkhardt, Dennis E.; Standish, Darrell E.; Madaus, Paul W.; Spacek, Dan J.;, 5,463,735, Cl. 395-200.100.
- Valdivia, Aaron D.; and Mohler, Eric L., to Westinghouse Electric Corp. Control mechanism for electric vehicle. 5,463,294, Cl. 318-432.000.
- Valeo Thermique Habitacle: *See*—
  - Loup, Didier, 5,462,483, Cl. 454-160.000.
- Valet, Thierry; and Tyc, Sté, to Thomson-Csf. Magnetoresistive transducer or magnetic read head including a layer of composite material including conducting magnetic particles in an insulating material. 5,463,516, Cl. 360-113.000.
- Valls, William H.: *See*—
  - Halaburda, Daniel J.; Dombrowski, David; and Valls, William H., 5,462,161, Cl. 206-705.000.
- Valmet Paper Machinery Inc.: *See*—
  - Rantanen, Rauno, 5,462,594, Cl. 118-249.000.
- Valor Enterprises, Inc.: *See*—
  - Liu, Duixian; and Cota, Glenn L., 5,463,405, Cl. 343-715.000.
- Valyi, Emery I., to Pepsico, Inc. Blow molded plastic container including an internal wall having a visual display. 5,462,278, Cl. 273-138.00R.
- Van Anglen, Erik S.: *See*—
  - Keeney, Harold M.; Van Anglen, Erik S.; and Forand, James L., 5,462,649, Cl. 205-93.000.
- Van Berkel, Cornelis, to U.S. Philips Corporation. Image sensor. 5,463,216, Cl. 250-208.100.
- Vandenbelt, Rudy; and Altman, Peter R., to Lumatec Industries, Inc. Miniature pocket flashlight with lens module and outer flexible sheath. 5,463,539, Cl. 362-189.000.
- Vanden Berghe, Dirk A.: *See*—
  - Kist, Joost; Rovers, Willem P. G.; and Vanden Berghe, Dirk A., 5,462,063, Cl. 128-756.000.
- Van den Eynde, Benoit: *See*—
  - Boon-Falleur, Thierry; van der Bruggen, Pierre; De Plaen, Etienne; Lurquin, Christophe; Traversari, Catia; Gaugler, Beatrice; and Van den Eynde, Benoit, 5,462,871, Cl. 435-240.200.
- Vanderbilt University: *See*—
  - Wang, Taylor G., 5,462,866, Cl. 435-174.000.
- van der Bruggen, Pierre: *See*—
  - Boon-Falleur, Thierry; van der Bruggen, Pierre; De Plaen, Etienne; Lurquin, Christophe; Traversari, Catia; Gaugler, Beatrice; and Van den Eynde, Benoit, 5,462,871, Cl. 435-240.200.
- Van Der Hoek, Marinus J.; Moor, Adolf H. K.; Bruinsma, Anastasius J. A.; Roos, Jaap; and Buisman, Jacobus C., to N.V. Nederlandse Spoorwegen. System for detecting trains. 5,462,244, Cl. 246-122.00R.
- van der Schoot, Bart: *See*—
  - de Rooij, Nicolaas Frans; Jeanneret, Sylvain; Gass, Volker; and van der Schoot, Bart, 5,462,839, Cl. 430-320.000.
- Van Der Voort, Lucia H. M.: *See*—

Groenen, Martinus A. M.; Veenstra, Annemarie E.; Van Solingen, Pieter; Koekman, Bertus P.; Van Der Voort, Lucia H. M.; Martin, Juan F.; Gutierrez, Santiago; Diez, Bruno; Alvarez, Emilio; Barredo, Jose L.; and Esmahan, Christina, 5,462,862, Cl. 435-69.100.

Van Dongen, Richard A.: *See*—

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Van Ert, Jack, to ASAA Technologies, Inc. Decorative panels for automobile interiors. 5,462,786, Cl. 428-171.000.

Van Gorp, Herman: *See*—

Roosen, Raymond; Van Gorp, Herman; and Monbaliu, Marcel, 5,462,822, Cl. 430-7.000.

Van Helmond, Johannes H. M., to SGB Holdings Ltd. for These Research & Development Dept. Holland. Scaffolding construction, in particular means for joining two or more of its posts in vertical position. 5,462,134, Cl. 182-178.000.

Vanmaele, Luc: *See*—

Janssens, Wilhelmus; and Vanmaele, Luc, 5,463,045, Cl. 546-158.000.

Van Maren, David J.: *See*—

Thompson, Bruce A.; Van Maren, David J.; McCarthy, John G.; Purcell, R. Andrew; and Rottinghaus, Michael, 5,463,772, Cl. 395-600.000.

Vannatta, Louis J.; and Phillips, James P., to Motorola. Diversity antenna structure having closely-positioned antennas. 5,463,406, Cl. 343-725.000.

Van Offenbeek, Johannes C.: *See*—

Roth, Rudolf; and Van Offenbeek, Johannes C., 5,463,607, Cl. 369-60.000.

Van Ouwerkerk, Pieter J., to P.J. Van Ouwerkerk Holding B.V. Outflow nozzle having independently adjustable outflow pipes. 5,462,230, Cl. 239-428.500.

Vanover, Michael T.: *See*—

Albaugh, Virgil A.; Muhich, John S.; Silha, Edward J.; and Vanover, Michael T., 5,463,739, Cl. 395-826.000.

Van Solingen, Pieter: *See*—

Groenen, Martinus A. M.; Veenstra, Annemarie E.; Van Solingen, Pieter; Koekman, Bertus P.; Van Der Voort, Lucia H. M.; Martin, Juan F.; Gutierrez, Santiago; Diez, Bruno; Alvarez, Emilio; Barredo, Jose L.; and Esmahan, Christina, 5,462,862, Cl. 435-69.100.

Van Steen, Bartholomeus J.: *See*—

Hartog, Jan; Van Steen, Bartholomeus J.; Mos, Johannes; and Schipper, Jacques, 5,462,942, Cl. 514-254.000.

van Steenbrugge, Bernard; de Leeuw, Henricus; and Mastroyiannis, Mihalis, to U.S. Philips Corporation. Local communication bus system comprising a set of interconnected devices, a control bus, and a set of signal interconnections, and a device and a switchbox for use in such system. 5,463,619, Cl. 370-58.100.

Van 'T Veer, Pieter, to Zweva Holding B.V. Housing device for fitting in the pavement. 5,462,383, Cl. 404-4.000.

Van Wagener, Raymond H.; Freimuth, Lothar; and Stein, Michael A., to MagneTek, Inc. Housing and mounting arrangement for thermal protector device. 5,463,522, Cl. 361-103.000.

Varner, Wayne F.: *See*—

Lutz, Dale R.; MacDougall, Trevor W.; Taylor, William L.; Varner, Wayne F.; and Wandmacher, Robert A., 5,463,312, Cl. 324-96.000.

Vass, Georges: *See*—

Bischoff, Erwin; Gao, Zhan; Wohlfeil, Stefan; Hecker, Gabriele; Cleophax, Jeannine; Dubreuil, Didier; Gero, Stéphane; Olesker, Alice; Verre-Sebrie, Catherine; Vieira de Almeida, Mauro; and Vass, Georges, 5,463,087, Cl. 549-336.000.

Vastveit, Kjell. Rotating liquid distributor for use with a spreader for liquid manure or other fluids. 5,462,232, Cl. 239-662.000.

Vawter, G. Allen: *See*—

Ashby, Carol I. H.; Hohimer, John P.; Neal, Daniel R.; and Vawter, G. Allen, 5,463,649, Cl. 372-40.000.

Vazquez, Michael L.; Mueller, Richard A.; Talley, John J.; Getman, Daniel; DeCrescenzo, Gary A.; and Freskos, John N., to G. D. Searle & Co. Succinoylamino hydroxyethylamino sulfonamides useful as retroviral protease inhibitors. 5,463,104, Cl. 514-533.000.

Vectra Fitness, Inc.: *See*—

Ish, A. Buell, III, 5,462,510, Cl. 482-142.000.

Veenstra, Annemarie E.: *See*—

Groenen, Martinus A. M.; Veenstra, Annemarie E.; Van Solingen, Pieter; Koekman, Bertus P.; Van Der Voort, Lucia H. M.; Martin, Juan F.; Gutierrez, Santiago; Diez, Bruno; Alvarez, Emilio; Barredo, Jose L.; and Esmahan, Christina, 5,462,862, Cl. 435-69.100.

VeloBind, Incorporated: *See*—

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Venolia, Daniel S., to Apple Computer, Inc. Automatic alignment of objects in two-dimensional and three-dimensional display space using an alignment field gradient. 5,463,722, Cl. 395-133.000.

Ventres, Romeo J.; Matuszak, Edward A.; and Merritt, Carleton G., to Borden, Inc. Method of making macaroni or noodle products using a low moisture content alimentary paste. 5,462,758, Cl. 426-557.000.

Verdaasdonk, Johannes P. M.: *See*—

Vorenkamp, Pieter; and Verdaasdonk, Johannes P. M., 5,463,308, Cl. 323-312.000.

Verdegan, Barry M.; Holm, Christopher E.; Fallon, Stephen L.; and Schwandt, Brian W., to Nelson Industries, Inc. Apparatus and method for in situ cleaning of oil filter. 5,462,679, Cl. 210-798.000.

Vermeersch, Joan: *See*—

Hauquier, Guido; Cortens, Willem; Coppens, Paul; Vermeersch, Joan; Mostaert, Erik; and Verschueren, Eric, 5,462,833, Cl. 430-159.000.

Verre-Sebrie, Catherine: *See*—

Bischoff, Erwin; Gao, Zhan; Wohlfeil, Stefan; Hecker, Gabriele; Cleophax, Jeannine; Dubreuil, Didier; Gero, Stéphane; Olesker, Alice; Verre-Sebrie, Catherine; Vieira de Almeida, Mauro; and Vass, Georges, 5,463,087, Cl. 549-336.000.

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Hauquier, Guido; Cortens, Willem; Coppens, Paul; Vermeersch, Joan; Mostaert, Erik; and Verschueren, Eric, 5,462,833, Cl. 430-159.000.

Vesley, George F.: *See*—

Williams, Jerry W.; DeVoe, Robert J.; Klun, Thomas P.; Vesley, George F.; and Zimmerman, Patrick G., 5,462,797, Cl. 428-345.000.

Vest, William C. Umbrella post light. 5,463,535, Cl. 362-102.000.

Vestar, Inc.: *See*—

Hostetler, Karl Y.; and Kumar, Raj, 5,463,092, Cl. 554-40.000.

Vetterick, Richard C., to Babcock & Wilcox Company, The. HRSG boiler design with air staging and gas reburn. 5,461,853, Cl. 60-39.020.

Vicaari, Richard, to Hoechst Celanese Corporation. Use of poly(35-disubstituted 4-hydroxystyrene/N-substituted maleimide for forming a negative image. 5,462,840, Cl. 430-326.000.

Victor Company of Japan, Ltd.: *See*—

Funaki, Masaki, 5,463,237, Cl. 257-336.000.

Takanashi, Itsuo; Nakagaki, Shintaro; Negishi, Ichiro; Suzuki, Tetsuji; Tatsumi, Fujiko; Takahashi, Ryusaku; and Maeno, Keiichi, 5,463,468, Cl. 358-296.000.

Vidwans, Rohit A.; Boggs, Darrell D.; Fetterman, Michael A.; and Glew, Andrew F., to Intel Corporation. Methods and apparatus for determining the next instruction pointer in an out-of-order execution computer system. 5,463,745, Cl. 395-375.000.

Viehbeck, Alfred; Goldberg, Martin; Tisdale, Stephen L.; Buchwalter, Stephen L.; Grebe, Kurt R.; Kovac, Caroline A.; and Matthew, Linda C., to International Business Machines Corporation. Method for bonding two surfaces together. 5,462,628, Cl. 156-281.000.

Viehbeck, Alfred: *See*—

Baum, Thomas H.; Mukherjee, Shyama P.; O'Toole, Terrence R.; Tai, Alice F.; and Viehbeck, Alfred, 5,462,897, Cl. 437-230.000.

Vieira de Almeida, Mauro: *See*—

Bischoff, Erwin; Gao, Zhan; Wohlfeil, Stefan; Hecker, Gabriele; Cleophax, Jeannine; Dubreuil, Didier; Gero, Stéphane; Olesker, Alice; Verre-Sebrie, Catherine; Vieira de Almeida, Mauro; and Vass, Georges, 5,463,087, Cl. 549-336.000.

Vik, Kai Magne: *See*—

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Vinciguerra, Lori J.: *See*—

Fisher, Gregory M.; Cebulka, Kathleen D.; Man, Susan K.; Nazif, Zaher A.; and Vinciguerra, Lori J., 5,463,682, Cl. 379-201.000.

Vincze, Albert M.; Seymour, Theodore J.; Culkeen, Patrick; Tang, Nai-Yong; Lewis, Gerald P.; Niessen, Paul; and Marlow, John V., to Cominco Ltd. Method and apparatus for producing metal strip. 5,462,109, Cl. 164-479.000.

Viola, Frank J.; Green, David T.; and Bolanos, Henry, to United States Surgical Corporation. Locking device for an apparatus for applying surgical fasteners. 5,462,215, Cl. 227-176.000.

Viscovitz, John H.: *See*—

Lippman, Jerome; Dolan, Michael J.; Sullivan, John J., Jr.; and Viscovitz, John H., 5,462,688, Cl. 252-89.100.

Vitale, Fabio: *See*—

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Vitron Systems Inc.: *See*—

Ridgewell, Barry A.; and Fenton, Miles, 5,462,406, Cl. 416-111.000.

Vlasblom, Jack, to Citra Science Ltd. Hoof and nail conditioner. 5,462,729, Cl. 424-61.000.

VLSI Technology, Inc.: *See*—

Gabriel, Calvin T., 5,462,892, Cl. 437-189.000.

Kwon, Young I., 5,462,624, Cl. 156-257.000.

Yurash, Stephen A., 5,463,338, Cl. 327-202.000.

Voda, Jan K. Suture device. 5,462,561, Cl. 606-144.000.

Vogel, Calvin, to Teva Pharmaceutical Industries, Ltd. Method of preparing etoposide. 5,463,040, Cl. 536-124.000.

Vogelgesang, Doug; and Ching, Douglas. Pull down storage shelf assembly. 5,462,347, Cl. 312-247.000.

Voigt, Douglas L.; and Jacobson, Michael B., to Hewlett-Packard Company. Storage management system for concurrent generation and fair allocation of disk space among competing requests. 5,463,776, Cl. 395-600.000.

Volante, Ralph P.: *See*—

Askin, David; Eng, Kan K.; and Volante, Ralph P., 5,463,067, Cl. 548-113.000.

Volat, Jean-Pierre: *See*—

Remy, Jean-Luc A. M.; Roch, Jean; and Volat, Jean-Pierre, 5,462,268, Cl. 271-225.000.

Vollmer, Jürgen: *See*—

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Volz, Keith L.: *See*—

Renn, Robert M.; and Volz, Keith L., 5,462,441, Cl. 439-67.000.

Von Hagen, Ingo; Popperling, Rolf; Schlerkmann, Hubertus; and Zeislmair, Ulrike, to Mannesmann Aktiengesellschaft. Weldable high-strength structural steel with 13% chromium. 5,462,615, Cl. 148-592.000.

VonPless, Douglas J. Apparatus for pre-treating soiled fabric articles prior to laundering. 5,461,887, Cl. 68-18.00F.
von Wedel, Wedigo; Eickhoff, Hubertus; Weck, Manfred; Tarabocchia, John; Schelbert, Ulrich; and Möller, Alexander, to Degussa Aktiengesellschaft. Process for the degradation of highly toxic halogenated organic compounds contained in gases. 5,463,170, Cl. 588-207.000.
Vorenkamp, Pieter; and Verdaasdonk, Johannes P. M., to U.S. Philips Corporation. Voltage-current converter. 5,463,308, Cl. 323-312.000.
Voshell, Sheila W.: *See—*
  Depoe, Ronald L.; and Voshell, Sheila W., 5,461,884, Cl. 66-170.000.
Voss, Kenneth E.: *See—*
  Farrauto, Robert J.; Voss, Kenneth E.; and Heck, Ronald M., 5,462,907, Cl. 502-304.000.
Voss, Richard, to Richard Voss Grubenausbau GmbH. Pressure-compensated pressure limiting valve. 5,462,076, Cl. 137-454.500.
Vreysen, Eduard J. C.: *See—*
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Vu, Thu N.: *See—*
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W. L. Gore & Associates, Inc.: *See—*
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W. R. Grace & Co.-Conn.: *See—*
  Driscoll, Mary E.; and Taub, Karl D., 5,462,235, Cl. 241-30.000.
Wachendorff-Neumann, Ulrike: *See—*
  Fischer, Reiner; Bretschneider, Thomas; Krüger, Bernd-Wieland; Erdelen, Christoph; Santel, Hans-Joachim; Lürssen, Klaus; Schmidt, Robert R.; Wachendorff-Neumann, Ulrike; and Stendel, Wilhelm, 5,462,913, Cl. 504-138.000.
  Seitz, Thomas; Klausener, Alexander; Berg, Dieter; Wachendorff-Neumann, Ulrike; Erdelen, Christoph; Hänssler, Gerd; Brandes, Wilhelm; and Dutzmann, Stefan, 5,462,943, Cl. 514-256.000.
Wacker-Chemitronic Gesellschaft für Elektronik-Grundstoffe mbH: *See—*
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Wacker-Werke GmbH & Co. KG: *See—*
  Polacek, Manfred, 5,462,388, Cl. 404-113.000.
Wada, Ichiro, to Kabushiki Kaisha Toshiba. Method of producing electromagnetic flowmeters with slits to reduce eddy currents. 5,461,771, Cl. 29-602.100.
Wada, Jyoji, to Matsushita Electric Industrial Co., Ltd. Imaging apparatus having rotary table. 5,463,292, Cl. 318-34.000.
Wada, Tetsunori: *See—*
  Toriumi, Akira; Shigyo, Naoyuki; Wada, Tetsunori; Tanimoto, Hiroyoshi; Ohuchi, Kazuya; and Yoshimi, Makoto, 5,463,234, Cl. 257-296.000.
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Wadell, Lars G. A., to Nestec S.A. Gripping and removing articles from a grooved surface. 5,462,152, Cl. 198-409.000.
Wadin, Craig P.: *See—*
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Wagner, Anthony S. Equipment and process for molten alloy pyrolysis of hazardous liquid waste. 5,461,991, Cl. 110-346.000.
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Wagner, Michael E.: *See—*
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Wagner, Paul: *See—*
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Wagner, Richard W.: *See—*
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Wagner, Steven R.: *See—*
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Waine, Peter J.; and Campbell, Bernard J., to Mars Incorporated. Money validators. 5,462,149, Cl. 194-206.000.
Wakabayashi, Kimihiro; and Nebashi, Noriyuki, to Fuji Xerox Co., Ltd. Method for fabricating a metal member having a plurality of fine holes. 5,462,648, Cl. 205-75.000.
Wakabayashi, Osamu: *See—*
  Ito, Noritoshi; Amada, Yoshiho; and Wakabayashi, Osamu, 5,463,650, Cl. 372-57.000.
Wakaki, Moriaki: *See—*
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Wakamatsu, Hideki, to Hewlett-Packard Company. Impedance meter. 5,463,323, Cl. 324-611.000.
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Waki, Masaki; Kasai, Junichi; Aoki, Tsuyoshi; Honda, Toshiyuki; and Sato, Hirotaka, to Fujitsu Limited. Semiconductor device having a plurality of chips. 5,463,253, Cl. 257-724.000.
Wakimizu, Yukio; Motiduki, Kunimasa; and Nagasawa, Masakazu, to Koito Manufacturing Co., Ltd. Insulating base for discharge lamp device. 5,463,270, Cl. 313-318.010.
Wakisaka, Toshiaki; and Nakagomi, Hirofumi, to NSK-Warner K.K. Brake band. 5,462,138, Cl. 188-77.00R.
WAKO Pure Chemical Industries, Ltd.: *See—*
  Sumino, Motoshige; Tani, Tsutomu; and Sano, Atsunori, 5,463,075, Cl. 548-365.100.
Walker, Anthony D.: *See—*
  Smith, Jay L.; Trubey, Bradley S.; and Walker, Anthony D., 5,463,634, Cl. 371-20.600.
Walker, Clifford M., III. Dispensing closure for fluid containers. 5,462,185, Cl. 215-307.000.
Walker, Gordon K.; and Moroney, Paul, to General Instrument Corporation. Automatic adjustment of receiver apparatus based on channel-bit-error-rate-affected parameter measurement. 5,463,403, Cl. 342-359.000.
Wall, Angela M.:, to E-Systems, Inc. Tuned microstrip antenna and method for tuning. 5,463,404, Cl. 343-700.0MS.
Wallace, James D. Ground rod driver. 5,462,126, Cl. 173-53.000.
Wallach, David: *See—*
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Walrath, Craig D.; and Arnts, James V., to Thermo King Corporation. Motion measurement system and method for airborne platform. 5,463,402, Cl. 342-359.000.
Walters, Marlin E.: *See—*
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Walters, Robert B.; and Schmidtline, Paul J., to Schuller International, Inc. Flame retarded asphalt composition. 5,462,588, Cl. 106-18.210.
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Wand, Steven M., to FlatPlate, Inc. Three-circuit stacked plate heat exchanger. 5,462,113, Cl. 165-167.000.
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Wang, Chia-Lin: *See—*
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Wang, King-Sheng. Retractable luggage handle release control and inner tube positioning arrangement. 5,461,756, Cl. 16-115.000.
Wang, Nai-Yi; Dubler, Robert E.; Ungemach, Frank S.; Walters, Roland L.; and Thacker, Susan A., to Abbott Laboratories. Fluorescence polarazation immunoassay for tetrahydrocannabinoids. 5,463,027, Cl. 530-388.900.
Wang, Oliver; and Hou, Ben, to Primax Electronics Ltd. Feeder used with scanner. 5,463,256, Cl. 271-274.000.
Wang, Paul J.; and Groeneveld, Peter W., to New England Medical Center Hospitals, Inc. Catheter electrodes. 5,462,545, Cl. 606-41.000.
Wang, Taylor G., to Vanderbilt University. Semipermeable microspheres encapsulating biological material. 5,462,866, Cl. 435-174.000.
Wano, Toyoki: *See—*
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Ward, Dennis M.; Aerts, Ronny A. W.; Meijer, Jean-Pierre; Arnswald, Silke; Sandoval, Gerald A.; and Schneemann, Herbert, to Dow Chemical Company, The. System and method for integrating a business environment with a process control environment. 5,463,555, Cl. 364-468.000.
Wardle, David G., to BOC Group plc, The. Cooling apparatus. 5,462,111, Cl. 165-104.140.
Wardwell, Robert H.; and Airhart, Durwood, to Hewlett-Packard Company. Probe with contacts that interdigitate with and wedge between adjacent legs of an IC or the like. 5,463,324, Cl. 324-754.000.
Warfield, Robert W.: *See—*
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Warner-Lambert Company: *See—*
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  French, James C.; Edmunds, Colin R.; McDonnell, Peter; and Showalter, Howard D. H., 5,463,035, Cl. 536-55.300.
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Watanabe, Kazushi; Sasaki, Shinichi; Ikemoto, Isao; Miyabe, Shigeo; and Noda, Shinya, to Canon Kabushiki Kaisha. Rotary member a process cartridge and an assembling method for rolling members. 5,463,446, Cl. 355-200.000.

Watanabe, Kiminori: *See—*
Ogura, Tsuneo; Watanabe, Kiminori; Nakagawa, Akio; Yamaguchi, Yoshihiro; Yasuhara, Norio; Matsudai, Tomoko; Hasegawa, Shigeru; and Nakayama, Kazuya, 5,463,231, Cl. 257-138.000.

Watanabe, Kouji: *See—*
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Watanabe, Makoto; Mochizuki, Isao; Sato, Yoshitsugu; Takagi, Takeyuki; and Okada, Hiroaki, to Brother Kogyo Kabushiki Kaisha. Key switch. 5,463,195, Cl. 200-5.00A.

Watanabe, Masayuki: *See—*
Kobuke, Yoshiaki; Togashi, Akio; Ozawa, Masaki; and Watanabe, Masayuki, 5,463,099, Cl. 556-117.000.

Watanabe, Naoki; Okutsu, Hirokazu; Isozaki, Masakazu; and Inoue, Kenji, to Fuji Photo Film Co., Ltd. Heat development processor wherein steam is discharged from a heat sensitive material. 5,463,444, Cl. 355-27.000.

Watanabe, Nobuhisa: *See—*
Hayashi, Kenji; Watanabe, Nobuhisa; Nose, Koichi; Tanaka, Hiroshi; Ohtsuka, Issei; Kokushi, Motoji; Hiyoshi, Hironobu; Kobayashi, Hiroko; Yamada, Toshie; and Horie, Toru, 5,462,958, Cl. 514-399.000.

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Watanabe, Toshio, to NEC Corporation. CMIS device with increased gain. 5,463,240, Cl. 257-369.000.

Watanabe, Tosiaki: *See—*
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Watanabe, Yuji, to Kabushiki Kaisha Toshiba. Multi-bank semiconductor memory device having common command detection. 5,463,590, Cl. 365-230.030.

Watase, Yasushi; Kinoshita, Masao; Watanabe, Hiroyuki; Hashimoto, Takeo; Iida, Takehiro; and Washiyama, Hiroaki, to Hamamatsu Photonics K.K. Cathode for photoelectric emission, cathode for secondary electron emission, electron multiplier tube, and photomultiplier tube. 5,463,272, Cl. 313-373.000.

Waters, R. Nicholas: *See—*
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Watson, James A.: *See—*
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Webb, Steve W.: *See—*
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Webb, Steven L.: *See—*
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Webber, James L.; and Holmes, Francis J., to General Motors Corporation. Supplemental inflation restraint inflator. 5,462,307, Cl. 280-737.000.

WebCore Technologies, Inc.: *See—*
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Wegerer, David A., to UOP. Short contact FCC process with catalyst blending. 5,462,652, Cl. 208-167.000.

Wehl, Wolfgang, to Eastman Kodak Company. Electrothermal ink print head. 5,463,411, Cl. 347-65.000.

Wehmeyer, Richard M.; Walters, Marlin E.; Tasset, Emmett L.; and Brewster, Steven L., to Dow Chemical Company, The. Process for making polyphenols from ketones or aldehydes and phenols. 5,463,140, Cl. 568-727.000.

Wei, Ching-Yeu: *See—*
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Powell, Joseph B.; Slaugh, Lynn H.; Forschner, Thomas C.; Semple, Thomas C.; and Weider, Paul R., 5,463,145, Cl. 568-867.000.
Slaugh, Lynn H.; Powell, Joseph B.; Forschner, Thomas C.; Semple, Thomas C.; and Weider, Paul R., 5,463,146, Cl. 568-862.000.

Weigum, Hans, to Synthes (U.S.A.). Trochanter stabilization device. 5,462,547, Cl. 606-65.000.

Weiler, Gerhard H., to Automatic Liquid Packaging, Inc. Threaded cap with controlled orifice liner for piercing a sealed container. 5,462,200, Cl. 222-83.000.

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Weiss, Stefan: *See—*
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Weisshaar, Erhard. Device for cutting pipe. 5,461,955, Cl. 83-54.000.

Welch Allyn, Inc.: *See—*
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Weller, Edward L., III: *See—*
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Weller, Edward L., Jr.; Renkor, Edward J.; and Weller, Edward L., III. Water based varnish for production of colored images. 5,462,834, Cl. 430-176.000.

Wellfleet Communications: *See—*
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Wellmann, Hans-Peter, to Claudius Peters Aktiengesellschaft. Crushing unit in a clinker cooler. 5,462,237, Cl. 241-57.000.

Wendhack, Kurt F. Collet adapter for converting machine vise to an orthogonal collet fixture. 5,462,294, Cl. 279-51.000.

Wendt, Heinz; and Pataj, Bruno, to Macor Marine Systems International GmbH. Ship, especially a ferry, with a bow door. 5,462,002, Cl. 114-260.000.

Wenzel, Harald, to Mannesmann Aktiengesellschaft. Process for compressing a gaseous medium. 5,461,861, Cl. 60-618.000.

Werner, Karl: *See—*
Baumann, Edgar; Obermeier, Wolfgang; and Werner, Karl, 5,463,467, Cl. 356-446.000.

Werner, Richard E.: *See—*
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Werner, Walter V., to AT&T IPM Corp. Selectively extracting infrared radiation from bioler interior to determine the temperature of individual boiler tubes. 5,462,358, Cl. 374-124.000.

Weronke, Robert B.: *See—*
Meisenburg, Gary L.; Eick, Edward C.; Magee, Phillip D.; Mixon, Charles M.; Weronke, Robert B.; Shields, Waylon D.; Smith, Woody R.; and Pavey, Steven J., 5,462,463, Cl. 440-80.000.

Werrbach, Donn, to Aphex Systems, Ltd. Peak accelerated compressor. 5,463,695, Cl. 381-106.000.

Wertheizer, Gideon; Be'ery Yair; Ovadia, Bat-Sheva; Gross, Yael; Perets, Ronen; and Milstein, Yakov, to DSP Semiconductors Ltd; and DSP Semiconductors USA, Inc. Simplified cyclical buffer. 5,463,749, Cl. 395-437.000.

Wess, Eduard: *See—*
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Wess, Günther: *See—*
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Wessels, Rob, to Comm/Scope. Dual layer fire-resistant plenum cable. 5,462,803, Cl. 428-380.000.

West, Lamar E.: *See—*
Schutte, Mark E.; Thatcher, William B.; and West, Lamar E., 5,463,689, Cl. 380-7.000.

West, Laurice J.; and Gabrelian, Edward E., to California Amplifier, Inc. Dual mode/dual band feed structures. 5,463,407, Cl. 343-786.000.

West, Michael W. J.: *See—*

- Manring, Lewis E.; and West, Michael W. J., 5,463,182, Cl. 525-330.400.
- Westerbeek, Johannes M. M.; Dijkgraaf, Jeroen T. M.; and Zijlmans, Joseph B. S., to Campina-Melkunie bv. Powder-form, foaming creamer. 5,462,759, Cl. 426-568.000.
- Westerfield, Robert P., Jr.: *See*—
  - Barnes, Michael S.; Keller, John H.; Logan, Joseph S.; Tompkins, Robert E.; and Westerfield, Robert P., Jr., 5,463,525, Cl. 361-234.000.
- Western Wire Works, Inc.: *See*—
  - Bokor, Anton, 5,462,175, Cl. 209-399.000.
- Westinghouse Air Brake Company: *See*—
  - Daugherty, David W., Jr.; Kanjo, Wajih; and Hawryszkow, Michael G., 5,462,179, Cl. 213-62.00R.
- Westinghouse Electric Corp.: *See*—
  - Guard, Glenn B., 5,463,342, Cl. 327-269.000.
  - Jones, Franklin B.; Nguyen, Ngon B.; and Laurandeau, Leroy, 5,463,252, Cl. 257-723.000.
  - Nguyen, Ngon B.; and Jones, Franklin B., 5,463,250, Cl. 257-698.000.
  - Valdivia, Aaron D.; and Mohler, Eric L., 5,463,294, Cl. 318-432.000.
- Whitaker Corporation, The: *See*—
  - Howell, David G., 5,462,456, Cl. 439-733.100.
  - Korsunsky, Iosif; Harlan, Tod M.; and Shipe, Joanne E., 5,462,444, Cl. 439-108.000.
  - Krämer, Rudolf; and Schaarschmidt, Manfred, 5,462,454, Cl. 439-571.000.
  - Sagawa, Tetsuya, 5,462,458, Cl. 439-752.000.
  - Schroepfer, Richard C.; and Knisely, Edward E., Jr., 5,462,457, Cl. 439-736.000.
- White Consolidated Industries, Inc.: *See*—
  - Sepke, Arnold L., 5,461,751, Cl. 15-246.300.
- White, Stanley A., to Rockwell International Corporation. Reduced quantization noise from single-precision multiplier. 5,463,575, Cl. 364-754.000.
- Whiteford, Donna T.: *See*—
  - Brenner, Gerald S.; Katdare, Ashok V.; Pretzer, Denise; and Whiteford, Donna T., 5,462,932, Cl. 514-108.000.
- Whitehead, Frank R.: *See*—
  - Zanelli, Claudio I.; and Whitehead, Frank R., 5,463,593, Cl. 367-13.000.
- Whiting, Douglas L.; George, Glen A.; and Ivey, Glen E., to Stac Electronics, Inc. Data compression apparatus and method. 5,463,390, Cl. 341-51.000.
- Wiand, Ronald C.: *See*—
  - Donatelli, Joseph M., Jr., 5,462,568, Cl. 51-309.000.
- Widl, Gerhard; and Fichter, Manfred, to Mannesmann Kienzle GmbH. Device for verifying disturbances in signal transmission in motor vehicles. 5,463,373, Cl. 340-441.000.
- Wiebus, Ernst: *See*—
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  - Bahrmann, Helmut; Greb, Wolfgang; Heymanns, Peter; Lappe, Peter; Müller, Thomas; Szameitat, Jürgen; and Wiebus, Ernst, 5,463,147, Cl. 568-882.000.
- Wiedner, Guenther; Duncan, John A.; and Patel, Suresh R., to Rotecno AG. Article of clothing, in particular for the medical or chemical field having barrier membrane in critical areas. 5,461,724, Cl. 2-2.000.
- Wiemann, David A.: *See*—
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- Wiemers, Karl: *See*—
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- Wiggins, Ralphe; Smith, Elizabeth; and Shanbaum, Suzanne P., to Advanced Systems, Inc. Window selection method and system for an interactive display. 5,463,727, Cl. 395-156.000.
- Wijas, Thomas S., to Motorola. Telephone mounting receptacle having opposed retractable latch members. 5,463,688, Cl. 379-446.000.
- Wikstrom, Hakan V.: *See*—
  - Svensson, Kjell A. I.; Wikstrom, Hakan V.; Carlsson, Per A. E.; Boije, Anna M. P.; Waters, R. Nicholas; Sonesson, Clas A.; Stjernlof, Nils P.; Andersson, Bengt R.; and Hansson, Lars O., 5,462,947, Cl. 514-317.000.
- Wildman, John R.: *See*—
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- Wilke, Michaela: *See*—
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- Wilkins, Samuel L. Automatic liquid dispensing device. 5,462,201, Cl. 222-95.000.
- Wilkinson, James H., to Sony United Kingdom Limited. Data compression. 5,463,699, Cl. 382-246.000.
- Wilkison, William W., III: *See*—
  - Sounik, James R.; Wilkison, William W., III; Russ, Keith M.; and Massarelli, Lynn, 5,463,108, Cl. 560-130.000.
  - Sounik, James R.; Wilkison, William W., III; and Russ, Keith M., 5,463,141, Cl. 568-763.000.
- Williams, Barry N.: *See*—
  - Bogle, Tom G.; Tuma, John E.; and Williams, Barry N., 5,461,906, Cl. 73-49.200.
- Williams, Jerry W.; DeVoe, Robert J.; Klun, Thomas P.; Vesley, George F.; and Zimmerman, Patrick G., to Minneapolis Mining and Manufacturing Company. Energy curable pressure-sensitive adhesive compositions. 5,462,797, Cl. 428-345.000.
- Williams, John R.: *See*—
  - Hill, Joe T.; Williams, John R.; and Utter, Robert E., 5,462,419, Cl. 418-55.400.
- Williams, Joseph A.: *See*—
  - Elko, David A.; Frey, Jeffrey A.; Helffrich, Audrey A.; Isenberg, John F., Jr.; Moore, Brian B.; Nick, Jeffery M.; Swanson, Michael D.; and Williams, Joseph A., 5,463,736, Cl. 395-848.000.
- Williams, Michael T., to Pfizer Inc. Process for preparing sertraline. 5,463,126, Cl. 564-222.000.
- Williams, Samuel R.: *See*—
  - Davidson, Rickie L.; and Williams, Samuel R., 5,462,367, Cl. 384-459.000.
- Williams, Trevor J.: *See*—
  - Mirle, Srinivas K.; and Williams, Trevor J., 5,462,835, Cl. 430-287.000.
- Williamson, Craig C.: *See*—
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  - Dennehey, T. Michael; Brown, Richard I.; and Williamson, Warren P., 5,462,416, Cl. 417-477.200.
- Willmann, Martin: *See*—
  - Marek, Jiri; Schubert, Dietrich; Baumann, Helmut; Muenzel, Horst; Offenberg, Michael; and Willmann, Martin, 5,461,917, Cl. 73-514.160.
- Willmund, Rolf, to Rhone-Poulenc Rhodia Aktiengesellschaft. Filter Tow, method for the production thereof, as well as tobacco smoke filter element and method for its production. 5,462,801, Cl. 428-372.000.
- Wilson, Allyen E., III: *See*—
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- Wilson, Gordon: *See*—
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- Wilson, Gordon G.: *See*—
  - Lowe, Danny D.; Wilson, Gordon G.; Baker, Michael E.; and Garner, Abram, 5,462,275, Cl. 273-94.000.
- Wilson, James; and Altrieth, Frederick E., to Eastman Kodak Company. Reproduction apparatus having multiple ways of entering an information system. 5,463,448, Cl. 355-202.000.
- Wilson, James A.: *See*—
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- Wilson, John R.: *See*—
  - Wolf, Martin L.; and Wilson, John R., 5,462,874, Cl. 435-297.500.
- Wilson, Richard A., Jr.; Daubner, John M.; and Jeffers, Frank D., to AEG Transportation Systems, Inc. Rules-based interlocking engine using virtual gates. 5,463,552, Cl. 364-436.000.
- Wilson, Robert D.: *See*—
  - Kuromoto, Traci Y.; Bell, Eric L.; McDugle, Woodrow G.; Eachus, Raymond S.; Puckett, Sherrill A.; Olm, Myra T.; and Wilson, Robert D., 5,462,849, Cl. 430-567.000.
- Wilt, Truman F.; Hayes, Deborah E.; Krepley, Charles R.; and Rardon, Daniel E., to PPG Industries, Inc. Acetoacetylated polymers crosslinked with carbamylmethylaminotriazines. 5,462,992, Cl. 525-176.000.
- Wing, Keith D.: *See*—
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- Winkler, Bernd: *See*—
  - Tillmann, Horst; Jentsch, Dietrich; Hering, Thomas; Warschewitz, Thomas; Sichelschmidt, Dieter; and Winkler, Bernd, 5,461,754, Cl. 16-82.000.
- Winsor Corporation: *See*—
  - Winsor, Mark D, 5,463,274, Cl. 313-493.000.
- Winsor, Mark D, to Winsor Corporation. Planar fluorescent lamp having a serpentine chamber and sidewall electrodes. 5,463,274, Cl. 313-493.000.
- Winter, Jeffrey J.; Holden, Homer N.; and Lawrence, James L., to Dayco Products, Inc. Flexible hose construction having an inner corrugated hose made of polymeric material. 5,462,090, Cl. 138-121.000.
- Winters, Thomas L. Life extending circuit for storage batteries. 5,463,304, Cl. 320-4.000.
- Winterton, Dean A., to Winterton, Dean A.; and Paw Paw Farmer's Factory Co. Rotary row cleaner with reversible spring. 5,461,995, Cl. 111-139.000.
- Wirth, Alfred: *See*—
  - Handke, Günther; Wirth, Alfred; and Zietsch, Andreas, 5,462,142, Cl. 188-299.000.
- Wirth Gallo Messtechnik AG: *See*—
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- Wirth, Johannes; Gallo, Mario, deceased (by Carl Burckhardt, executor), to Wirth Gallo Messtechnik AG. Process for operating a measurement instrument, and measurement instrument suitable for use with this process. 5,463,192, Cl. 177-25.140.
- Wisconsin Alumni Research Foundation: *See*—
  - Letchworth, Geoffrey J., III; and Israel, Barbara A., 5,462,734, Cl. 424-229.100.
- Witczak, Pamela A. Garment for nursing woman. 5,461,725, Cl. 2-104.000.
- Witzel, Tom; Fuchs, Eberhard; and Zimmermann, Horst, to BASF Aktiengesellschaft. Preparation of peralkylated amines. 5,463,130, Cl. 564-490.000.
- Witzig, Armin: *See*—
  - Reichl, Asta; Jenner, Martin; Witzig, Armin; Rose, Anita; and Kuenzl, Bernd, 5,462,359, Cl. 374-148.000.

- Wize, Gary A.: *See—*
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- Wm. Wrigley Jr. Company: *See—*
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- Woggon, Wolf D.: *See—*
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- Wohlfeil, Stefan: *See—*
  - Bischoff, Erwin; Gao, Zhan; Wohlfeil, Stefan; Hecker, Gabriele; Cleophax, Jeannine; Dubreuil, Didier; Gero, Stéphane; Olesker, Alice; Verre-Sebrie, Catherine; Vieira de Almeida, Mauro; and Vass, Georges, 5,463,087, Cl. 549-336.000.
- Wolf, Martin L.; and Wilson, John R. Dialyzed multiple well tissue culture plate. 5,462,874, Cl. 435-297.500.
- Wolf, Reinhard: *See—*
  - Tomzig, Erich; Wolf, Reinhard; and Hensel, Wolfgang, 5,462,011, Cl. 117-18.000.
- Wolff Walsrode Aktiengesellschaft: *See—*
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  - Kniewske, Reinhard; Kiesewetter, René; Reinhardt, Eugen; and Szablikowski, Klaus, 5,463,036, Cl. 536-86.000.
- Wolford, Jeff W.: *See—*
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- Wollinsky, Kurt H.; and Saefkow, Michael W. K., to Pall Corporation. Filter for liquor filtration. 5,462,667, Cl. 210-645.000.
- Wolter, Karin; Müller, Walter; Simon, Günter; Nalbach, Christa; and Hoffmann, Hans-Rainer, to LTS Lohmann Therapie-Systeme GmbH & Co. KG. Patch for transdermal administration of volatile pharmaceutically active ingredients of chemically basic nature and a process for preparation. 5,462,746, Cl. 424-449.000.
- Womack, Robert C. Head mounted work light. 5,463,538, Cl. 362-106.000.
- Wong, Mag K.; and Wong, Patrick T. T., to Patwong Technologies, Inc. Disposable all purpose micro sample holder. 5,463,223, Cl. 250-339.120.
- Wong, Patrick T. T.: *See—*
  - Wong, Mag K.; and Wong, Patrick T. T., 5,463,223, Cl. 250-339.120.
- Wood, Dan L.: *See—*
  - Cullinan, George J.; Singh, Jai P.; and Wood, Dan L., 5,462,937, Cl. 514-212.000.
- Wood, Glenn C.; and Mehra, Yuv R., to Advanced Extraction Technologies, Inc. Absorption process without external solvent. 5,462,583, Cl. 95-192.000.
- Wood, Graham R., to AE Piston Products Limited. Method of manufacturing piston rings. 5,461,776, Cl. 29-888.072.
- Woodard, Robert E.: *See—*
  - Samson, Gene; Engelson, Erik T.; Chee, Hiram; and Woodard, Robert E., 5,462,523, Cl. 604-30.000.
- Woodley, Frank. Modified propeller blade. 5,462,462, Cl. 440-49.000.
- Woods, Jimmy L.: *See—*
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- Woodsmith Corporation: *See—*
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- Woodson, Lewis P., to Minnesota Mining and Manufacturing Company. Biofilm reduction method. 5,462,644, Cl. 204-131.000.
- Woodward, David F., to Allergan, Inc. EP_2-receptor agonists as agents for lowering intraocular pressure. 5,462,968, Cl. 514-568.000.
- Wormley, Samuel J.: *See—*
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- Wormslev, Erik C.: *See—*
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- Wörther, Rudolf H.: *See—*
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- Wu, Chyi-Chang, to United Microelectronics Corp. Electrical matrix keyboard scanning circuit. 5,463,386, Cl. 341-26.000.
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- Wursteisen, Michel: *See—*
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- XAAR Limited: *See—*
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- Xerox Corporation: *See—*
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  - Mandel, Barry P.; Resto, Suzzette S.; Rizzolo, Charles D.; Green, Frederick A.; Van Dongen, Richard A.; and Billings, Phillip A., 5,462,265, Cl. 270-53.000.
  - Moffat, Karen A.; Pontes, Fatima M.; Paine, Anthony J.; McAneney, Brian; and Puri, Paul, 5,462,828, Cl. 430-106.000.
  - Pozniakas, Robert S.; and Minagawa, Gary A., 5,463,455, Cl. 355-299.000.
  - Swift, Joseph A.; and Orlowski, Thomas E., 5,462,773, Cl. 427-555.000.
- Yaeger, John R., to Seagate Technology, Inc. Disc drive slider lifter using shape memory metals. 5,463,514, Cl. 360-105.000.
- Yagi, Shigeru; Ono, Masato; Higashi, Taketoshi; Ohta, Tsuyoshi; and Fukuda, Yuzuru, to Fuji Xerox Co., Ltd. Electrophotographic photoreceptor and electrophotographic process. 5,462,827, Cl. 430-65.000.
- Yagi, Yasuhiko: *See—*
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- Yale University: *See—*
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- Yamada, Hiromichi; Ohkubo, Masaharu; Ojima, Masaki; Sasame, Hiroshi; Kawana, Takashi; Seto, Kaoru; Mano, Hiroshi; Saito, Tetsuo; Kashihara, Atsushi; and Ito, Michio, to Canon Kabushiki Kaisha. Siphen for correcting a pulse-width modulated signal in a recording apparatus. 5,463,473, Cl. 358-300.000.
- Yamada, Hiroyasu, to Casio Computer Co., Ltd. Photoelectric conversion system. 5,463,420, Cl. 348-294.000.
- Yamada, Isamu; Shiba, Akira; and Iizuka, Miyuki, to Fujitsu Limited. Ultrasonic diagnostic system. 5,462,058, Cl. 128-661.080.
- Yamada, Katsumi: *See—*
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- Yamada, Kumi: *See—*
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- Yamada, Masao: *See—*
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- Yamada, Minoru; and Kawamura, Shingo, to Yoshida Kogyo K.K. Method of producing hard multilayer film formed material. 5,462,775, Cl. 427-573.000.
- Yamada, Osamu: *See—*
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- Yamada, Takeshi: *See—*
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- Yamada, Toshie: *See—*
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- Yamagishi, Hirotoshi: *See—*
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- Yamaguchi, Hiroshi: *See—*
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- Yamaguchi, Tadashi: *See—*
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- Yamaguchi, Takuji, to Noritsu Koku Co., Ltd. Leader, methods for attaching the leader to a film and for detaching it therefrom, and developing apparatus with automatic attachment and detachment of the leader. 5,463,441, Cl. 354-321.000.
- Yamaguchi, Yoshihiro: *See—*

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Aoyama, Tateo, 5,462,027, Cl. 123-432.000.

Kai, Manabu, 5,462,031, Cl. 123-478.000.

Kobaysahi, Noboru, 5,462,460, Cl. 440-6.000.

Yamaji, Hirotaka, to NEC Corporation. Biasing circuit of an amplifier. 5,463,350, Cl. 330-296.000.

Yamakami, Gensaku, to Matsuba Electric Manufacturing Co., Ltd. Power seat driving apparatus for a vehicle. 5,462,337, Cl. 297-344.130.

Yamakawa Industrial Co., Ltd.: *See—*

Masuda, Mitsuo; and Fujii, Hiroshi, 5,462,325, Cl. 293-102.000.

Yamakawa, Kenji, to Fuji Photo Film Company, Ltd. Bleaching method for thermosensitive recording medium. 5,463,417, Cl. 347-212.000.

Yamakawa, Kouji: *See—*

Yano, Keiichi; Takahashi, Takashi; Kimura, Kazuo; Sato, Yoshitoshi; Yamakawa, Kouji; Yamamoto, Toshishige; Fujii, Masafumi; Hashimoto, Shizuki; and Takamichi, Hiroshi, 5,463,248, Cl. 257-677.000.

Yamaki, Isao: *See—*

Iji, Masahiro; Yoda, Masami; Suzuki, Shin; Ishizuka, Kaoru; Kubo, Sotoo; Yamaki, Isao; and Hashimoto, Toshikuni, 5,462,672, Cl. 210-727.000.

Yamamori, Teruo; Harada, Hiroshi; Sakai, Katsunori; Iwaki, Kazumi; and Matsunaga, Kazuki, to Shionogi & Co., Ltd. Benzothiazepine derivatives. 5,462,936, Cl. 514-211.000.

Yamamoto, Hidefumi: *See—*

Shinjo, Teruya; Yamamoto, Hidefumi; Anno, Toshihiko; and Takada, Toshio, 5,462,795, Cl. 428-332.000.

Yamamoto, Katsumoto: *See—*

Yasuda, Hironori; and Yamamoto, Katsumoto, 5,461,758, Cl. 19-239.000.

Yamamoto, Kazuo: *See—*

Hidano, Tetsuhiro; Takeda, Hiroyuki; Tsukada, Masayuki; Yamamoto, Kazuo; and Inoue, Atsushi, 5,463,038, Cl. 536-124.000.

Yamamoto, Keisaku; Ikeda, Kiyoshi; and Fukuyama, Masahiro, to Sumitomo Chemical Co., Ltd. Rubber compositions for sponge rubber. 5,462,975, Cl. 521-90.000.

Yamamoto, Makoto: *See—*

Takatori, Sunao; Kumagai, Ryohei; Matsumoto, Koji; and Yamamoto, Makoto, 5,463,717, Cl. 395-24.000.

Yamamoto, Mitsuo: *See—*

Inaba, Shigeru; Fukuhara, Masaaki; Hirota, Makoto; Yamamoto, Mitsuo; Abe, Jun; Miyata, Hideaki; Sunaga, Takayuki; Ishikawa, Toru; Shiina, Yoshio; Isosu, Toru; and Kanno, Makoto, 5,463,452, Cl. 355-246.000.

Yamamoto, Ryoichi; Nakao, Fujimasa; Okamoto, Etsurou; and Yagi, Yasuhiko, to Mitsui PetrochemicalIndustries, Ltd. Process and apparatus for producing terephthalic acid. 5,463,113, Cl. 562-414.000.

Yamamoto, Shigeru; Matsushita, Shigenori; Zhang, Shu H.; Nishita, Satoru; and Nakata, Kazushi, to Kabushiki Kaisha Komatsu Seisakusho. Automatic drive control system for a bulldozer. 5,462,122, Cl. 172-2.000.

Yamamoto, Shuji, to Fujitsu Limited. Error pulse width expanding circuit. 5,463,631, Cl. 371-5.100.

Yamamoto, Sukeyoshi: *See—*

Asabe, Kazutaka; Nishiguchi, Masaru; and Yamamoto, Sukeyoshi, 5,462,808, Cl. 428-551.000.

Yamamoto, Taizo; Konishi, Hirokazu; Kawaguchi, Yoshihisa; and Nagao, Akira, to Japan Elanco Company Limited. Apparatus for examining the external appearance of solid articles. 5,463,465, Cl. 356-394.000.

Yamamoto, Tetsu: *See—*

Kurosawa, Miki; Ogawa, Shuji; Sugahara, Masayuki; Funai, Kiyoshi; Yumura, Takashi; and Yamamoto, Tetsu, 5,463,202, Cl. 219-121.830.

Yamamoto, Tohru; and Yoshida, Shigeo, to Canon Kabushiki Kaisha. Recording medium for business machines, production thereof, and ink-jet recording method employing the same. 5,462,787, Cl. 428-195.000.

Yamamoto, Toshishige: *See—*

Yano, Keiichi; Takahashi, Takashi; Kimura, Kazuo; Sato, Yoshitoshi; Yamakawa, Kouji; Yamamoto, Toshishige; Fujii, Masafumi; Hashimoto, Shizuki; and Takamichi, Hiroshi, 5,463,248, Cl. 257-677.000.

Yamamoto, Yasuhiro: *See—*

Tanifuji, Yoichi; and Yamamoto, Yasuhiro, 5,462,998, Cl. 526-67.000.

Yamamoto, Yuuri: *See—*

Matsuoka, Akihiko; Ohnishi, Hiroshi; Kunieda, Yoshinori; Misaizu, Kouei; and Yamamoto, Yuuri, 5,463,627, Cl. 370-105.100.

Yamamura, Nobuyuki, to Samsung Electronics Co., Ltd. Liquid crystal display having liquid crystal layers alternately stacked with insulating layers with a thickness of at most 5 microns. 5,463,481, Cl. 359-53.000.

Yamane, Tadanao, to Nishikawa Rubber Co., Ltd. Door seal device. 5,462,292, Cl. 277-181.000.

Yamanouchi, Koichi: *See—*

Iwao, Toru; Hirai, Kenichi; Kondoh, Nobuo; Yamanouchi, Koichi; and Yokoyama, Kazumasa, 5,462,951, Cl. 514-334.000.

Yamanouchi Pharmaceutical Co., Ltd.: *See—*

Tamazawa, Kazuharu; Kojima, Tadao; Arima, Hideki; Murakami, Yukiyasu; Isomura, Yasuo; Okada, Minoru; Takanobu, Kiyoshi; and Takenaka, Toichi, 5,463,064, Cl. 546-281.000.

Yamashita, Hirofumi; Inoue, Ikuko; Sasaki, Michio; and Miyagawa, Ryohei, to Kabushiki Kaisha Toshiba. Solid-state imaging device with internal smear eliminator. 5,463,232, Cl. 257-223.000.

Yamashita, Masahiro: *See—*

Deguchi, Hiroaki; Yamashita, Masahiro; and Masuda, Yukihiro, 5,463,421, Cl. 348-296.000.

Yamashita, Shinichi: *See—*

Kashida, Motokazu; and Yamashita, Shinichi, 5,463,392, Cl. 341-110.000.

Yamashita, Takeo: *See—*

Otomo, Shigekazu; Kumasaka, Noriyuki; Shiiki, Kazuo; Yamashita, Takeo; Saito, Noritoshi; and Tarutani, Yoshinobu, 5,463,518, Cl. 505-171.000.

Yamashita, Yoshiomi, to Mitsubishi Denki Kabushiki Kaisha. Multiprocessing system for exchanging running-state information by encoding the information into an address for transmission between processors. 5,463,734, Cl. 395-200.190.

Yamashita, Yoshiro: *See—*

Yui, Toshitake; Yamashita, Yoshiro; Koide, Fuminori; Chujo, Akihiko; and Hashimoto, Ken, 5,462,590, Cl. 106-20.00R.

Yamato, Shinichi: *See—*

Enoki, Masatoshi; Tokunaga, Osamu; Yamato, Shinichi; and Imazono, Masahiko, 5,462,224, Cl. 236-12.130.

Yamauchi, Kenji: *See—*

Kanayama, Hideyuki; Amano, Ryuhei; Yamauchi, Kenji; and Kanatani, Keiichi, 5,463,434, Cl. 353-94.000.

Yamazaki, Hiraku; Sugai, Teruo; Kato, Shigeo; Tazoe, Haruo; Hotate, Shiroh; and Goto, Iwao, to Toshiba Ceramics Co. Silicon carbide coated carbon composite material and method for making same. 5,462,800, Cl. 428-408.000.

Yamazaki, Shunpei; and Inujima, Takashi, to Semiconductor Energy Laboratory Co., Ltd. CVD of conformal coatings over a depression using alkylmetal precursors. 5,462,767, Cl. 427-248.100.

Yamazaki, Shunpei, to Semiconductor Energy Laboratory Co., Ltd. Electro-optical device having an anodic oxide film. 5,463,483, Cl. 359-58.000.

Yanagisawa, Ikuo: *See—*

Matsumoto, Jiro; and Yanagisawa, Ikuo, 5,461,768, Cl. 29-509.000.

Yanagisawa, Makiko: *See—*

Onoue, Takashi; Araki, Kiyoshi; Ishida, Noriya; Kitamura, Toshiya; Niitsu, Yasuhiko; Yanagisawa, Makiko; Sakamoto, Ryo; and Sato, Fumihiro, 5,462,821, Cl. 429-218.000.

Yanagisawa, Tetsu, to Sony Corporation. CD-ROM disc reproducing apparatus with means for storing progression data of a control means. 5,463,601, Cl. 364-32.000.

Yanes, Adalberto G.: *See—*

Benhase, Michael T.; Beardsley, Brent C.; Sherman, William G., II; and Yanes, Adalberto G., 5,463,752, Cl. 395-481.000.

Yang, Shan T. Structure of skid-proof plate for stairs. 5,461,836, Cl. 52-179.000.

Yano, Keiichi; Takahashi, Takashi; Kimura, Kazuo; Sato, Yoshitoshi; Yamakawa, Kouji; Yamamoto, Toshishige; Fujii, Masafumi; Hashimoto, Shizuki; and Takamichi, Hiroshi, to Kabushiki Kaisha Toshiba; Sumitomo Metal Industries, Ltd.; and Sumitomo Metal Cerami. Semiconductor package using an aluminum nitride substrate. 5,463,248, Cl. 257-677.000.

Yaron, Arieh: *See—*

Dan, Jacov; and Yaron, Arieh, 5,462,739, Cl. 424-427.000.

Yashiki, Yuichi; Hondumi, Masahiko; Ohki, Yuzuru; Ito, Takashi; Nakjajima, Fumitaka; Mori, Masakazu; Aoki, Takayoshi; Mizuishi, Harumitsu; and Shibuya, Yuusaku, to Fuji Xerox Co., Ltd. Cleaning assistant used with a photosensitive drum unit for lowering charge memory. 5,463,456, Cl. 355-299.000.

Yashiro, Toru: *See—*

Konishi, Toshio; Horibe, Toshihiko; Yashiro, Toru; Watanabe, Kouji; and Shuin, Toshiya, 5,462,806, Cl. 428-451.000.

Yasrebi, Mehrad, to International Business Machines Corporation. High performance machine for switched communications in a heterogeneous data processing network gateway. 5,463,625, Cl. 370-85.130.

Yasuda, Akio: *See—*

Ikumoto, Junichi; and Yasuda, Akio, 5,461,993, Cl. 111-52.000.

Yasuda, Hironori; and Yamamoto, Katsumoto, to Howa Machinery, Ltd. Roller device for sensing and controlling unevenness of silver in a carding machine. 5,461,758, Cl. 19-239.000.

Yasuda, Makoto: *See—*

Tanaka, Nobuhiko; Narabayashi, Tadashi; Miyano, Hiroshi; Takahashi, Hideaki; Yamada, Katsumi; and Yasuda, Makoto, 5,462,229, Cl. 239-397.500.

Yasuda, Shin-ichiro; Kawabe, Kuniyasu; and Sasaki, Mitsuhiro, to KAO Corporation. Method of forming fixed images using encapsulated toner. 5,463,454, Cl. 355-290.000.

Yasuhara, Norio: *See—*

Ogura, Tsuneo; Watanabe, Kiminori; Nakagawa, Akio; Yamaguchi, Yoshihiro; Yasuhara, Norio; Matsudai, Tomoko; Hasegawa, Shigeru; and Nakayama, Kazuya, 5,463,231, Cl. 257-138.000.

Yasukohchi, Tohru: *See—*

Miyazaki, Tsuyoshi; Sanchika, Kouzoh; Nishida, Mitsuhiro; Yasukohchi, Tohru; Kitano, Shigeru; Suginaka, Akinori; and Kadoma, Yoshihito, 5,463,066, Cl. 548-112.000.

Yates, Paul A.: *See—*

Srisathapat, Chad; and Yates, Paul A., 5,462,525, Cl. 604-67.000.

Yates, Simon J.: *See—*

Marks, John W. G.; and Yates, Simon J., 5,461,960, Cl. 89-1.510.

Yavitz, Edward Q. Intraoral smoke removal device. 5,462,049, Cl. 128-205.270.

Yazaki Corporation: *See—*
- Furuya, Yoshinobu, 5,462,023, Cl. 123-143.00C.
- Kodama, Shinji, 5,462,450, Cl. 439-489.000.

Yea, Ton A. Wind power machine. 5,463,257, Cl. 290-55.000.

Yeager, James W. Zippered film and bag. 5,461,845, Cl. 53-451.000.

Yeda Research and Development Company Ltd.: *See—*
- Aderka, Dan; Maor, Yasmin; Wallach, David; and Revel, Michel, 5,462,731, Cl. 424-85.200.

Yeda Research and Development Co., Ltd.: *See—*
- Dan, Jacov; and Yaron, Arieh, 5,462,739, Cl. 424-427.000.

Yedlin, Vincent J.: *See—*
- Filion, Scott M.; Frost, Colin C.; Moore, Denis L.; Roberge, Richard D.; and Yedlin, Vincent J., 5,463,258, Cl. 307-10.100.

Yee, Dawson L., to Intel Corporation. Low impact collision detection method. 5,463,658, Cl. 375-257.000.

Yee, Loren W.; and Sinh, Nguyen X., to National Semiconductor Corporation. Multiple differential input ECL or/nor gate. 5,463,332, Cl. 326-126.000.

Yeh, George C. Method for dissolved air floatation and similar gas-liquid contacting operations. 5,462,669, Cl. 210-703.000.

Yeh, Te-Hsin. Electrical connector. 5,462,451, Cl. 439-493.000.

Yen, Huan-Chun: *See—*
- Chen, Chung-Hsu; and Yen, Huan-Chun, 5,463,275, Cl. 313-495.000.

Yeo, Jae H.: *See—*
- Kim, Yong Z.; Oh, Hun S.; Yeo, Jae H.; Lim, Jong C.; Bang, Chan S.; Kim, Won S.; and Yim, Hyeon J., 5,462,935, Cl. 514-206.000.

Yianakopoulos, Georges, to Colgate-Palmolive Co. Hard surface cleaners/microemulsions comprising an anticorrosion system to protect acid-sensitive surfaces. 5,462,697, Cl. 252-528.000.

Yifrach, Aharon; and Newman, David S. Radio receiver and buffer system therefor. 5,463,599, Cl. 369-7.000.

Yim, Hyeon J.: *See—*
- Kim, Yong Z.; Oh, Hun S.; Yeo, Jae H.; Lim, Jong C.; Bang, Chan S.; Kim, Won S.; and Yim, Hyeon J., 5,462,935, Cl. 514-206.000.

Yin, Patrick: *See—*
- Bair, Owen S.; Yin, Patrick; and Chen, Chih-Chung, 5,463,563, Cl. 364-490.000.

Yiu, Tom D.: *See—*
- Chao, Liang; Lin, Tien-Ler; and Yiu, Tom D., 5,463,586, Cl. 365-210.000.

Yoda, Masami: *See—*
- Iji, Masahiro; Yoda, Masami; Suzuki, Shin; Ishizuka, Kaoru; Kubo, Sotoo; Yamaki, Isao; and Hashimoto, Toshikuni, 5,462,672, Cl. 210-727.000.

Yokoshi, Noriyuki: *See—*
- Maruyama, Takumi; Onodera, Takashi; Hatakenaka, Nobuko; Uno, Hiroaki; and Yokoshi, Noriyuki, 5,463,663, Cl. 375-356.000.

Yokoyama, Genkichi; and Sekine, Takayuki, to Alcare Co., Ltd. Substrate for retaining a hardenable composition. 5,461,885, Cl. 66-170.000.

Yokoyama, Kazumasa: *See—*
- Iwao, Toru; Hirai, Kenichi; Kondoh, Nobuo; Yamanouchi, Koichi; and Yokoyama, Kazumasa, 5,462,951, Cl. 514-334.000.

Yonescu, William: *See—*
- Stern, Howard; Yonescu, William; Vaiana, Joseph; and Mauro, Alex, 5,463,227, Cl. 250-559.290.

Yoneyama, Hiroyuki, to Fuji Photo Film Co., Ltd. Silver halide color photographic material. 5,462,846, Cl. 430-507.000.

Yonezawa, Hirokazu; and Yamaguchi, Seiji, to Matsushita Electric Industrial Co., Ltd. Memory device having address translator and comparator for comparing memory cell array outputs. 5,463,751, Cl. 395-401.000.

Yoo, Hee-Sang: *See—*
- Lee, Kab Y.; Yoo, Hee-Sang; and Jang, Young C., 5,461,875, Cl. 62-89.000.

York, James F.: *See—*
- Filgas, David M.; McFadden, Gordon M.; Broome, Jeffrey; and York, James F., 5,463,710, Cl. 385-90.000.

York Technology Limited: *See—*
- Svendsen, David A., 5,463,466, Cl. 356-440.000.

Yoshida, Hiroaki; Ohta, Masashi; and Nakamura, Akira, to Toyota Jidosha Kabushiki Kaisha. Hydraulic pressure booster having booster piston and valve mechanism associated with mechanically operated and electrically controlled pressure regulators. 5,462,343, Cl. 303-114.100.

Yoshida Kogyo K.K.: *See—*
- Matsushima, Kiyomitsu; Odake, Hidekazu; Ohashi, Tamotsu; and Tsukada, Isamu, 5,462,154, Cl. 198-699.000.
- Yamada, Minoru; and Kawamura, Shingo, 5,462,775, Cl. 427-573.000.

Yoshida, Shigeo: *See—*
- Yamamoto, Tohru; and Yoshida, Shigeo, 5,462,787, Cl. 428-195.000.

Yoshida, Shohei: *See—*
- Kawamoto, Fumio; Sakaino, Yoshiki; and Yoshida, Shohei, 5,462,824, Cl. 430-501.000.

Yoshida, Takashi: *See—*
- Nakano, Masaaki; Inoue, Tomoaki; Amano, Hideaki; Takatsuka, Akio; Beppu, Osamu; Mori, Kenji; Yoshida, Takashi; and Kohno, Takashi, 5,463,511, Cl. 360-99.080.

Yoshida, Tetsuo: *See—*
- Shimizu, Izuru; Yoshida, Tetsuo; Iguchi, Masao; and Fukanuma, Tetsuhiko, 5,462,418, Cl. 418-55.300.

Yoshida, Yukihiro, to Sharp Kabushiki Kaisha. Multivalued subtracter having capability of sharing plural multivalued signals. 5,463,573, Cl. 364-746.200.

Yoshikawa, Hiroyuki: *See—*
- Umeda, Yasushi; Tomiyama, Tetsuo; Yoshikawa, Hiroyuki; and Koike, Yuichi, 5,463,545, Cl. 364-187.000.

Yoshikawa, Takao; and Moriyama, Takaaki, to Nitto Denko Corporation. Pressure-sensitive adhesive having excellent heat-resistance, adhesive sheet using it, and method for producing those. 5,462,977, Cl. 522-160.000.

Yoshikoshi, Hideyuki: *See—*
- Sugiyama, Shunichi; Kametani, Hiroshi; Yoshikoshi, Hideyuki; Ikeda, Nobuaki; and Hara, Tomihiro, 5,462,686, Cl. 252-62.620.

Yoshimatsu, Naoki: *See—*
- Fujita, Akira; and Yoshimatsu, Naoki, 5,463,251, Cl. 257-717.000.

Yoshimi, Makoto: *See—*
- Toriumi, Akira; Shigyo, Naoyuki; Wada, Tetsunori; Tanimoto, Hiroyoshi; Ohuchi, Kazuya; and Yoshimi, Makoto, 5,463,234, Cl. 257-296.000.

Yoshimoto, Kazuyuki: *See—*
- Minami, Takanori; Shiraishi, Noriaki; Shimizu, Tsutomu; Takamuku, Kenji; Tsushio, Yoshinori; Mizushima, Yoshio; Yoshimoto, Kazuyuki; and Kadokura, Masaki, 5,462,021, Cl. 123-3.000.

Yoshimoto, Kenichi: *See—*
- Kimura, Tomoaki; Nihei, Mitsuo; Horii, Kenji; and Yoshimoto, Kenichi, 5,461,770, Cl. 29-527.700.

Yoshimura, Koutaro: *See—*
- Isobe, Minoru; Yoshimura, Koutaro; and Togashi, Shigemi, 5,462,375, Cl. 400-680.000.

Yoshimura, Mitsunori: *See—*
- Okamura, Okiyoshi; Sakai, Katsuma; and Yoshimura, Mitsunori, 5,462,816, Cl. 429-18.000.

Yoshioka, Yasuhiro, to Fuji Photo Film Co., Ltd. Silver halide color photographic light-sensitive material. 5,462,845, Cl. 430-505.000.

Yoshiyuki, Inada: *See—*
- Takehiko, Naka; and Yoshiyuki, Inada, 5,463,073, Cl. 548-303.700.

Young, Alastair J., to Automotive Products, plc. Self-locking differential gear. 5,461,941, Cl. 74-650.000.

Young, David T.; Marshall, Jill A.; Schweikert, Emile A.; and Park, Melvin A., to Southwest Research Institute. Time of flight mass spectrometer, ion source, and methods of preparing a sample for mass analysis and of mass analyzing a sample. 5,463,220, Cl. 250-288.000.

Young, Eddie L., to B. F. Goodrich FlightSystems, Inc. Method and apparatus for multiple reply rejection when decoding transponder replay signals. 5,463,398, Cl. 342-46.000.

Young, James P. Adjustable mouth prop. 5,462,435, Cl. 433-140.000.

Young, Paul: *See—*
- Saxena, Vinit; and Young, Paul, 5,462,659, Cl. 210-198.200.

Young, Trent P.; Young, Trent P., Jr.; Ingram, Paul R.; and Ingram, Steven J., to SOL-CAP, Inc. Process for absorbing toxic waste for long term permanent storage. 5,463,163, Cl. 588-249.000.

Young, Trent P., Jr.: *See—*
- Young, Trent P.; Young, Trent P., Jr.; Ingram, Paul R.; and Ingram, Steven J., 5,463,163, Cl. 588-249.000.

Young, Wayne P.: *See—*
- Bolanos, Henry; Sater, Ghaleb A.; DeFonzo, Stephan A.; and Young, Wayne P., 5,462,555, Cl. 606-120.000.
- Kolesa, Michael S.; Mastri, Dominick L.; Young, Wayne P.; and Bolanos, Henry, 5,462,558, Cl. 606-139.000.

Youngs, John K., to General Electric Company. Solvent extraction process. 5,463,177, Cl. 423-10.000.

Youngs, Ross O., to Univenture, Inc. Storage container with integral flap. 5,462,160, Cl. 206-312.000.

Yowell, Donald H. Mixing-cutting paddle. 5,462,355, Cl. 366-343.000.

Yozan Inc.: *See—*
- Takatori, Sunao; Kumagai, Ryohei; Matsumoto, Koji; and Yamamoto, Makoto, 5,463,717, Cl. 395-24.000.

Yu, Chia-Nien; Pelosi, Stanford S., Jr.; and Calcagno, Mark A., to Norwich Eaton Pharmaceuticals, Inc. 4-oxocyclic ureas useful as antiarrhythmic and antifibrillatory agents. 5,462,940, Cl. 514-235.800.

Yuasa, Toyotaka: *See—*
- Doi, Toshiya; Ozawa, Takeshi; Tanaka, Kazuhide; Yuasa, Toyotaka; Kamo, Tomoichi; and Matsuda, Shinpei, 5,462,922, Cl. 505-785.000.

Yuasa, Yoshifumi; Okeda, Yoshiki; Tachikawa, Akio; Nagakura, Akira; and Tsuruta, Haruki, to Takasago International Corporation. N-(l-aspartyl)amino alcohol derivative and sweetener containing the same. 5,463,118, Cl. 562-502.000.

Yuhta, Toshio; Nishimura, Ikuya; Kano, Daijiro; Saitou, Tsuyoshi; Suzuki, Tomita; and Tanaka, Mamoru, to NSK Ltd. Wear resisting slide member. 5,462,362, Cl. 384-13.000.

Yui, Dai; Suganuma, Hiroshi; Ishikawa, Shinji; and Semura, Shigeru, to Sumitomo Electric Industries, Ltd. Optical waveguide module having a waveguide affixed thereto at a first bonding strength and optical fibers affixed thereto at a second bonding strength. 5,463,708, Cl. 385-49.000.

Yui, Toshitake; Yamashita, Yoshiro; Koide, Fuminori; Chujo, Akihiko; and Hashimoto, Ken, to Fuji Xerox Co., Ltd. Ink-jet ink and method of printing using the same. 5,462,590, Cl. 106-20.00R.

Yuki, Sachiko: *See—*
- Shimada, Tadahiro; Yuki, Sachiko; and Iizuka, Tomoko, 5,462,691, Cl. 252-174.150.

Yum, Su I.: *See—*

Enscore, David J.; Campbell, Patricia S.; Osborne, James L.; Smart, Melinda K.; and Yum, Su I., 5,462,745, Cl. 424-448.000.

Yumura, Takashi: *See—*

Kurosawa, Miki; Ogawa, Shuji; Sugahara, Masayuki; Funai, Kiyoshi; Yumura, Takashi; and Yamamoto, Tetsu, 5,463,202, Cl. 219-121.830.

Yurash, Stephen A., to VLSI Technology, Inc. Dual latch clocked LSSD and method. 5,463,338, Cl. 327-202.000.

Yurgevich, Howard J., to Rosby Corporation. Integrated interbox connectors. 5,462,188, Cl. 220-1.500.

Zacche', Vanni; Orlandi, Ireneo; and Pedercini, Maurizio, to ALFA Costruzioni Meccaniche S.P.A. Device for changing the angular relation between a carousel conveyor and a kinematically-linked labeling group of a labeling machine. 5,462,632, Cl. 156-566.000.

Zachman, James R.: *See—*

Schmuck, Phillip W.; Hayter, Steven R.; Zachman, James R.; and Salerni, John V., 5,462,121, Cl. 166-383.000.

Zahm, Charles: *See—*

Polivka, Alan L.; and Zahm, Charles, 5,463,656, Cl. 375-200.000.

Zajacek, John G.: *See—*

Rodriguez, Carmen L.; and Zajacek, John G., 5,463,090, Cl. 549-531.000.

Zambon Group S.p.A.: *See—*

Stroppolo, Federico; Bonadeo, Daniele; and Gazzaniga, Annibale, 5,463,117, Cl. 562-496.000.

Zander, Dennis R., to Eastman Kodak Company. Fold-in information-bearing panel and fold-out write-on panel for outer cover of single-use camera. 5,463,439, Cl. 354-288.000.

Zanelli, Claudio I.; and Whitehead, Frank R., to Claudio I. Zanelli, Intec Research Company. Apparatus for quantitative measurements of ultrasonic wave power distribution. 5,463,593, Cl. 367-13.000.

Zanetti, Nadia: *See—*

Togni, Antonio; Spindler, Felix; Zanetti, Nadia; and Tijani, Amina, 5,463,097, Cl. 556-14.000.

Zehner, Georgia L.: *See—*

Bruemmer, Mary A.; Rosch, Paulette M.; Vukos, John P.; Uitenbroek, Duane G.; Zehner, Georgia L.; and Rasmussen, Christine A., 5,462,541, Cl. 604-391.000.

Zeislmair, Ulrike: *See—*

Von Hagen, Ingo; Popperling, Rolf; Schlerkmann, Hubertus; and Zeislmair, Ulrike, 5,462,615, Cl. 148-592.000.

Zeiss, Werner: *See—*

Roesler, Richard; Schelle, Siegfried; Gnann, Michael; and Zeiss, Werner, 5,462,692, Cl. 252-186.260.

Zeleznik, Haim: *See—*

Rauch, Joseph A., 5,461,782, Cl. 30-47.000.

Zeneca Limited: *See—*

Brown, George R.; and Shute, Richard E., 5,463,011, Cl. 528-44.000.

Zenigame, Masaaki: *See—*

Hayashida, Haruo; Ichige, Akihiro; Ogawa, Tadatoshi; Yamada, Takeshi; Tada, Teruo; Zenigame, Masaaki; Wano, Toyoki; and Kondo, Kazuo, 5,462,777, Cl. 428-2.000.

Zexel Corporation: *See—*

Nakamura, Hisashi, 5,462,032, Cl. 123-501.000.

Zhang, Shu H.: *See—*

Yamamoto, Shigeru; Matsushita, Shigenori; Zhang, Shu H.; Nishita, Satoru; and Nakata, Kazushi, 5,462,122, Cl. 172-2.000.

Zhang, Wei-Zhong: *See—*

Doi, Yukio; Zhang, Wei-Zhong; Ishitani, Koichi; and Kinugasa, Masayoshi, 5,462,988, Cl. 524-501.000.

Zhao, Kang: *See—*

Landry, Donald W.; and Zhao, Kang, 5,463,028, Cl. 530-405.000.

Ziebol, Robert J., to ADC Telecommunications, Inc. Fiber optic switch. 5,463,704, Cl. 385-22.000.

Ziel, J. Mark: *See—*

Hunt, Thomas J.; Herrick, Benjamin M.; Robertson, Kimberly K.; Thiele, Karl E.; and Ziel, J. Mark. 5,462,057, Cl. 128-661.010.

Zielesch, Paul A.: *See—*

Doolittle, Miles G.; and Zielesch, Paul A., 5,462,146, Cl. 192-4.00A.

Zierenberg, Bernd: *See—*

Gupte, Arun R.; Rohr, Uwe; and Zierenberg, Bernd, 5,462,744, Cl. 424-448.000.

Zietsch, Andreas: *See—*

Handke, Günther; Wirth, Alfred; and Zietsch, Andreas, 5,462,142, Cl. 188-299.000.

Zijlmans, Joseph B. S.: *See—*

Westerbeek, Johannes M. M.; Dijkgraaf, Jeroen T. M.; and Zijlmans, Joseph B. S., 5,462,759, Cl. 426-568.000.

Zimmer, Herbert, to Siemens Aktiengesellschaft. Converter for generating an output signal as a function of the position of a transducer part. 5,463,259, Cl. 307-106.000.

Zimmer, Inc.: *See—*

Dietz, Terry L.; and Miller, Stephen C., 5,462,550, Cl. 606-86.000.

Zimmerman, Patrick G.: *See—*

Williams, Jerry W.; DeVoe, Robert J.; Klun, Thomas P.; Vesley, George F.; and Zimmerman, Patrick G., 5,462,797, Cl. 428-345.000.

Zimmerman, Robert. Seed drill planting assembly. 5,461,994, Cl. 111-121.000.

Zimmerman, Scott M.: *See—*

Beeson, Karl W.; Zimmerman, Scott M.; Ferm, Paul M.; and McFarland, Michael J., 5,462,700, Cl. 264-1.270.

Zimmerman, Steven M., to International Business Machines Corporation. Process and structure of an integrated vacuum microelectronic device. 5,463,269, Cl. 313-309.000.

Zimmermann, Christian: *See—*

Kugler, Karl-Heinz; Gollin, Walter; Riedel, Karlheinz; and Zimmermann, Christian, 5,462,036, Cl. 123-609.000.

Zimmermann, Horst: *See—*

Witzel, Tom; Fuchs, Eberhard; and Zimmermann, Horst, 5,463,130, Cl. 564-490.000.

Zink, Robert M.; Bazany, Donald J.; and Tramper, Douglas E., to Bradford Company. Tote box handle. 5,462,221, Cl. 229-117.160.

ZMD Corporation: *See—*

Freeman, Gary A.; and Hamilton, Ward M., 5,462,157, Cl. 206-210.000.

Zuccolin, John D.: *See—*

Turner, Josephine S.; Murray, D. Gary; Zuccolin, John D.; and Li, Ruey S., 5,462,743, Cl. 424-448.000.

Zukowski, Stanislaw L., to W. L. Gore & Associates, Inc. Surface modified porous expanded polytetrafluoroethylene and process for making. 5,462,781, Cl. 428-36.100.

Zumberge, Mark A.; Canuteson, Eric L.; and Parker, Paul R., to University of California, The Regents of the. Optical fiber gravity meter. 5,461,914, Cl. 73-382.00R.

Zweva Holding B.V.: *See—*

Van 'T Veer, Pieter, 5,462,383, Cl. 404-4.000.

Zynda, Martin: *See—*

Schmale, Gerhard; Sommer, Norbert; and Zynda, Martin, 5,462,339, Cl. 297-452.550.

Zywiak, Thomas M., to United Technologies Corporation. Regenerative condensing cycle. 5,461,882, Cl. 62-401.000.

3-Dimensional Pharmaceuticals, Inc.: *See—*

Agrafiotis, Dimitris K.; Bone, Roger F.; Salemme, Francis R.; and Soll, Richard M., 5,463,564, Cl. 364-496.000.

5-These Industrie: *See—*

Arlandis, Yves, 5,462,384, Cl. 404-6.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 31th DAY OF OCTOBER, 1995

NOTE— Arranged in accordance with the first significant character or word if the name (in accordance with city and telephone directory practice).

Allina, Edward. Electrical transient surge protection. Re. 35,077, Cl. 361-56.000.

Condulet Adapter, Inc.: *See*—
    Lammens, Albert, Jr., Re. 35,075, Cl. 220-3.200.

Dickey, Billy R.: *See*—
    Dickey, Maylon E.; and Dickey, Billy R., Re. 35,073, Cl. 134-6.000.

Dickey, Maylon E.; and Dickey, Billy R., to Martin, Gary N.; and Wilkens, Judy A. Apparatus and method for removing oil spots from a surface. Re. 35,073, Cl. 134-6.000.

Lamarre, Bruce L., to North East Environmental Products, Inc. Removing hazardous contaminants from water. Re. 35,074, Cl. 210-747.000.

Lammens, Albert, Jr., to Condulet Adapter, Inc. Extension for electrical junction box . Re. 35,075, Cl. 220-3.200.

Macrovision Corporation: *See*—
    Ryan, John O., Re. 35,078, Cl. 380-11.000.

Martin, Gary N.: *See*—
    Dickey, Maylon E.; and Dickey, Billy R., Re. 35,073, Cl. 134-6.000.

Nakamura, Kazunari, to Olympus Optical Co., Ltd. Endoscope apparatus for displaying images below the mucous membrance. Re. 35,076, Cl. 348-70.000.

North East Environmental Products, Inc.: *See*—
    Lamarre, Bruce L., Re. 35,074, Cl. 210-747.000.

Olympus Optical Co., Ltd.: *See*—
    Nakamura, Kazunari, Re. 35,076, Cl. 348-70.000.

Ryan, John O., to Macrovision Corporation. Method and apparatus for encrypting and decrypting time domain signals. Re. 35,078, Cl. 380-11.000.

Wilkens, Judy A.: *See*—
    Dickey, Maylon E.; and Dickey, Billy R., Re. 35,073, Cl. 134-6.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Abolins, Visvaldis, to General Electric Company. Titanium dioxide filled polyphenylene ether compositions. B1 4,318,836, Cl. 524-141.000.

Acromed Corp.: *See*—
    Steffee, Arthur D., B1 4,648,388, Cl. 606-61.000.
    Steffee, Arthur D., B1 4,719,905, Cl. 606-61.000.

Avery International Corp.: *See*—
    Chen, Tien-Tsung; Popat, Ghanshyam H.; and Streeter, Stephanie A., B1 4,784,317, Cl. 229-92.300.

Buschmann, Johannes. SIDs detection apparatus and methods. B1 5,241,300, Cl. 340-573.000.

Chen, Tien-Tsung; Popat, Ghanshyam H.; and Streeter, Stephanie A., to Avery International Corp. One piece mailer for laser printer. B1 4,784,317, Cl. 229-92.300.

Decker, Alain: *See*—
    Sadoun, Michael; and Decker, Alain, B1 5,011,403, Cl. 433-8.000.

Dobkin, Robert C.: *See*—
    Sevastopoulos, Nello G.; and Dobkin, Robert C., B1 4,988,952, Cl. 330-51.000.

Ehman, Richard L.; and Felmlee, Joel P., to Mayo Medical Resources. Method for reducing artifacts in NMR images. B1 4,715,383, Cl. 128-653.200.

Felmlee, Joel P.: *See*—
    Ehman, Richard L.; and Felmlee, Joel P., B1 4,715,383, Cl. 128-653.200.

General Electric Company: *See*—
    Abolins, Visvaldis, B1 4,318,836, Cl. 524-141.000.

Gupta, Amitava, to Ioptex Research, Inc. Multifocal optical lens. B1 5,080,472, Cl. 359-652.000.

Hilstolsky, Frank J., to Metro Industries Inc. Modular rack system for use with removable pans. B1 5,263,595, Cl. 211-126.000.

Ioptex Research, Inc.: *See*—
    Gupta, Amitava, B1 5,080,472, Cl. 359-652.000.

Linear Technology Corporation: *See*—
    Sevastopoulos, Nello G.; and Dobkin, Robert C., B1 4,988,952, Cl. 330-51.000.

Mayo Medical Resources: *See*—
    Ehman, Richard L.; and Felmlee, Joel P., B1 4,715,383, Cl. 128-653.200.

Metro Industries Inc.: *See*—
    Hilstolsky, Frank J., B1 5,263,595, Cl. 211-126.000.

Popat, Ghanshyam H.: *See*—
    Chen, Tien-Tsung; Popat, Ghanshyam H.; and Streeter, Stephanie A., B1 4,784,317, Cl. 229-92.300.

Praxair S.T. Technology, Inc.: *See*—
    Taylor, Thomas A., B1 5,073,433, Cl. 428-134.000.

Sadoun, Michael; and Decker, Alain. Orthodontic bracket made from zirconium oxide. B1 5,011,403, Cl. 433-8.000.

Sevastopoulos, Nello G.; and Dobkin, Robert C., to Linear Technology Corporation. High Q switched capacitor filter having internal thin-film resistors. B1 4,988,952, Cl. 330-51.000.

Shiber, Samuel, to Surgical Systems & Instruments, Inc. Atherectomy device. B1 4,842,579, Cl. 604-22.000.

Steffee, Arthur D., to Acromed Corp. Apparatus and method for maintaining vertebrae in a desired relationship. B1 4,648,388, Cl. 606-61.000.

Steffee, Arthur D., to AcroMed Corp. Apparatus and method for maintaining vertebrae in a desired relationship. B1 4,719,905, Cl. 606-61.000.

Streeter, Stephanie A.: *See*—
    Chen, Tien-Tsung; Popat, Ghanshyam H.; and Streeter, Stephanie A., B1 4,784,317, Cl. 229-92.300.

Surgical Systems & Instruments, Inc.: *See*—
    Shiber, Samuel, B1 4,842,579, Cl. 604-22.000.

Taylor, Thomas A., to Praxair S.T. Technology, Inc. Thermal barrier coating for substrates and process for producing it. B1 5,073,433, Cl. 428-134.000.

LIST OF DESIGN PATENTEES

Abrahamson, Marilyn F. Glove for use in oral stimulation. 363,606, Cl. D4-103.000.

Abrams, Richard W.; Crossman, Russell J.; and Ashley, Charles R., to Johnson & Johnson Vision Products, Inc. Package for a contact lens. 363,601, Cl. D3-264.000.

Advantek, Inc.: *See*—
    Chenoweth, Dean B., 363,659, Cl. D8-382.000.

Agarwal, Rajnish. Motorcycle watch. 363,677, Cl. D10-33.000.

Aladdin Synergetics, Inc.: *See*—
    Mueller, Jonathan H., 363,671, Cl. D9-447.000.
    Wyatt, William B.; and Silverstein, Steven A., 363,644, Cl. D7-553.000.

Alden, Tor A.; Beacken, Marc J.; Doran, Robert L.; Nordman, John E.; and Turner, James G., to AT&T IPM Corp. Video camera unit mounted on a personal computer monitor. 363,731, Cl. D16-202.000.

Aldridge, Timothy W.; and Click, Gerald H., to Motorola, Inc. Data communications device housing. 363,722, Cl. D14-242.000.

Allen, Andrew J. Ground inserted helical staff support. 363,616, Cl. D6-417.000.

Allen, Truman F.: *See*—
    Robertson, G. Neil, II; and Allen, Truman F., 363,774, Cl. D24-110.000.

Allied Domecq Spirits & Wine Limited (British Co.): *See*—
    Brough, Ralph J.; and Parker, Jack, 363,668, Cl. D9-544.000.

Ancona, Bruce; Ancona, Jane; DeGuzman, Mary J.; and Kilduff, Edward H., to B. Via International Housewares, Inc. Kettle. 363,633, Cl. D7-302.000.

Ancona, Jane: *See*—
    Ancona, Bruce; Ancona, Jane; DeGuzman, Mary J.; and Kilduff, Edward H., 363,633, Cl. D7-302.000.

Anderson, Mark E.; Cooper, Richard J.; Paoli, Ernie R.; and Stream, Robert D., to Hach Company. Laboratory nephelometer. 363,676, Cl. D10-75.000.

Angulo, Antonio: *See*—

  Baratta-Dragono, Georg; Webster, Judith C.; Brown, John L.; Angulo, Antonio; Klitsner, Daniel B.; Hom, Joanne; and Jones, P. Storey, 363,667, Cl. D9-542.000.
Aries International, Inc.: *See—*
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Asano, Osamu, to Nitto Kohki Co., Ltd. Hole cutter. 363,728, Cl. D15-139.000.
Asher, Doris L. Earring and pin display. 363,602, Cl. D3-270.000.
Ashley, Charles R.: *See—*
  Abrams, Richard W.; Crossman, Russell J.; and Ashley, Charles R., 363,601, Cl. D3-264.000.
AT&T IPM Corp.: *See—*
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  Lum, Michael W.; McAteer, Jeffrey P.; and Wills, Robert B., 363,721, Cl. D14-226.000.
Auburn, James H., Jr. Sanitary eye patch. 363,779, Cl. D24-189.000.
Audiovox Corporation: *See—*
  Dziersk, Mark; Harris, Kenneth D., Jr.; and Repp, Timothy C., 363,673, Cl. D10-104.000.
B. Via International Housewares, Inc.: *See—*
  Ancona, Bruce; Ancona, Jane; DeGuzman, Mary J.; and Kilduff, Edward H., 363,633, Cl. D7-302.000.
Bancroft, Joseph C. Pry guard header element. 363,797, Cl. D25-124.000.
Baratta-Dragono, Georg; Webster, Judith C.; Brown, John L.; Angulo, Antonio; Klitsner, Daniel B.; Hom, Joanne; and Jones, P. Storey, to Clorox Company, The. Bottle. 363,667, Cl. D9-542.000.
Bardsley, Earl F.: *See—*
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Barile, Peter, to Shelby Williams Industries, Inc. Ganging mechanism for chairs. 363,658, Cl. D8-382.000.
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Benetti, Cristiano: *See—*
  Gallon, Denis; and Benetti, Cristiano, 363,690, Cl. D11-216.000.
Bianco, James S.; Bianco, James W.; and Phelps, Brian W., to Control Module Inc. Receipt printer. 363,734, Cl. D18-50.000.
Bianco, James W.: *See—*
  Bianco, James S.; Bianco, James W.; and Phelps, Brian W., 363,734, Cl. D18-50.000.
Birgel, William. Double convex mirror to assist in coupling a trailer to a tow vehicle and loading boat on trailer. 363,694, Cl. D12-189.000.
Black & Decker Inc.: *See—*
  Gierke, Martin P., 363,656, Cl. D8-66.000.
Bochnak, Bruce; and Rutledge, Scott E., to Wooster Brush Company, The. Scratch brush handle. 363,609, Cl. D4-138.000.
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Bouilhet, Henri, to Orfevrerie Christofle. Flatware. 363,650, Cl. D7-645.000.
Boyd, Anthony B. Cantilevered carport. 363,790, Cl. D25-56.000.
Brough, Ralph J.; and Parker, Jack, to Allied Domecq Spirits & Wine Limited (British Co.). Container. 363,668, Cl. D9-544.000.
Brown, John L.: *See—*
  Baratta-Dragono, Georg; Webster, Judith C.; Brown, John L.; Angulo, Antonio; Klitsner, Daniel B.; Hom, Joanne; and Jones, P. Storey, 363,667, Cl. D9-542.000.
Bryson, John D., Jr.: *See—*
  Kopp, Robert; and Bryson, John D., Jr., 363,772, Cl. D23-355.000.
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  Cane, Richard M.; and Byard, Wayne R., 363,778, Cl. D24-172.000.
Byrne, Barbara. Sun and privacy screen. 363,597, Cl. D3-5.000.
Caley, Malcolm, to McKechnie UK Limited. Tile edging strip. 363,788, Cl. D25-119.000.
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Campbell, Clinton B. Pipe compactor tool. 363,725, Cl. D15-123.000.
Cane, Richard M.; and Byard, Wayne R. Coupler for adapting a beam splitter to an otoscope. 363,778, Cl. D24-172.000.
Canon Kabushiki Kaisha: *See—*
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  Cashin, Sally K.; and Cesaroni, William C., 363,635, Cl. D7-354.000.
Chang, Chiu-Tsun, to P&F Brother Industrial Corporation. Electric saw. 363,726, Cl. D15-133.000.
Chang, Li-Hsia. Air fryer. 363,637, Cl. D7-358.000.
Chang, Philip W., to Packard Bell Electronics, Inc. Tower computer. 363,704, Cl. D14-100.000.
Chenoweth, Dean B., to Advantek, Inc. Clip for a band. 363,659, Cl. D8-382.000.
Cindrich, Christopher N.; and Merino, Tristan A., to International Business Machines Corporation. Speaker enclosure. 363,719, Cl. D14-216.000.
Citizen Watch Co., Ltd.: *See—*
  Sugimoto, Isao, 363,733, Cl. D18-50.000.
Click, Gerald H.: *See—*
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  Baratta-Dragono, Georg; Webster, Judith C.; Brown, John L.; Angulo, Antonio; Klitsner, Daniel B.; Hom, Joanne; and Jones, P. Storey, 363,667, Cl. D9-542.000.
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Colibri Corporation: *See—*
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Davies, Alan J. E., to McKechnie UK Limited. Edging strip for tiled steps. 363,785, Cl. D25-69.000.
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DiGrazia, Paul M. Fishing rod handle protector. 363,756, Cl. D22-142.000.
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Estrada, Daniel G.; and Estrada, Mark A. Fishing harness for an inner tube. 363,753, Cl. D21-237.000.
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  Flohr, Daniel P.; and Floyd, Charles, 363,730, Cl. D16-202.000.
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Freeland, Jack T. Lumber straightener. 363,729, Cl. D15-140.000.
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  Onoda, Akira; Shimose, Norihiko; Fujii, Mitsunari; and Morita, Yusuke, 363,714, Cl. D14-129.000.
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Furey, Edward; Gravel, Marian H.; Moffatt, Susan S.; Muenkel, Gerard F.; and Parkin, Thomas A., to International Business Machines Corporation. Computer system. 363,708, Cl. D14-102.000.
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179	5,461,836
204.68	5,461,837
396.01	5,461,838
466	5,461,834
519	5,461,839
786.13	5,461,840

CLASS 53

234	5,461,841
434	5,461,843
449	5,461,844
451	5,461,845
571	5,461,846

CLASS 55

385.6	5,462,569

CLASS 56

16.7	5,461,847
320.1	5,461,848
400.06	5,461,849

CLASS 57

212	5,461,850

CLASS 59

4	5,461,851
84	5,461,852

CLASS 60

39.02	5,461,853
39.05	5,461,854
39.06	5,461,855
230	5,461,856
276	5,461,857
325	5,461,858
517	5,461,859
611	5,461,860
618	5,461,861
641.9	5,461,862
676	5,461,863
723	5,461,864
737	5,461,865
757	5,461,866

CLASS 62

4	5,461,867
5	5,461,868
6	5,461,869
11	5,461,870
24	5,461,871
51.1	5,461,873
60	5,461,874
89	5,461,875
160	5,461,876
185	5,461,877
255	5,461,878
280	5,461,879
298	5,461,880
401	5,461,882
469	5,461,883

CLASS 65

17.1	5,462,570
437	5,462,571

CLASS 66

170	5,461,884
210	5,461,881

CLASS 68

3 SS	5,461,886
18 F	5,461,887
181 R	5,461,888
189	5,461,889

CLASS 70

16	5,461,890
18	5,461,891
73	5,461,892

CLASS 72

7	5,461,893
8	5,461,894
21	5,461,895
181	5,461,896
213	5,461,897
256	5,461,898
272	5,461,899
479	5,461,900

CLASS 73

4 R	5,461,901
23.32	5,461,902
40	5,461,903
46	5,461,904
49.2	5,461,906
87	5,461,942
105	5,461,907
118.1	5,461,908
155	5,461,909
170.12	5,461,910
201	5,461,911
202	5,461,912
204.25	5,461,913
382 R	5,461,914
431	5,461,915
514.03	5,461,919
514.16	5,461,917
514.26	5,461,918
514.32	5,461,916
622	5,461,920
628	5,461,921
756	5,461,922
761	5,461,923
786	5,461,924
789	5,461,925
800	5,461,926
818	5,461,928
831	5,461,929
861.04	5,461,930
861.28	5,461,931
861.61	5,461,932
862.623	5,461,933
864.52	5,461,934

CLASS 74

424.8 R	5,461,935
489	5,461,936
493	5,461,937
502.4	5,461,938
562.5	5,461,939
603	5,461,940
650	5,461,941

CLASS 75

10.16	5,462,572
231	5,462,573
238	5,462,574
243	5,462,575
248	5,462,576
345	5,462,577
404	5,462,578
624	5,462,579
678	5,462,580

CLASS 76

89.2	5,461,943
119	5,461,944

CLASS 81

15.7	5,461,945
53.2	5,461,946
56	5,461,947
57.3	5,461,949
61	5,461,950
128	5,461,948
412	5,461,951
460	5,461,952

CLASS 83

36	5,461,953
49	5,461,954
54	5,461,955
221	5,461,956
713	5,461,957

CLASS 84

267	5,461,958
421	5,461,959
604	5,463,183
719	5,463,184
731	5,463,185

CLASS 89

1.51	5,461,960
1.815	5,461,961
14.4	5,461,962
37.22	5,461,963

CLASS 91

375 R	5,461,964
408	5,461,965

CLASS 92

1	5,461,966
71	5,461,967

CLASS 95

175	5,462,582
192	5,462,583
231	5,462,584
261	5,462,585

CLASS 96

13	5,462,586

CLASS 99

287	5,461,968
506	5,461,969
575	5,461,970
645	5,461,971

CLASS 100

45	5,461,972
53	5,461,973
188 R	5,461,975

CLASS 101

31.1	5,461,976
137	5,461,977
248	5,461,978
365	5,461,979
415.1	5,461,980

CLASS 102

513	5,461,982
530	5,461,983

CLASS 104

243	5,461,984

CLASS 105

30	5,461,985
165	5,461,986
167	5,461,987

CLASS 106

2	5,462,587
18.21	5,462,588
18.33	5,462,589
20 R	5,462,590
22 R	5,462,592
124	5,462,593

CLASS 108

51.3	5,461,988
147	5,461,974
153	5,461,989

CLASS 110

261	5,461,990
346	5,461,991

CLASS 111

7.2	5,461,992
52	5,461,993
121	5,461,994
139	5,461,995

CLASS 112

80.3	5,461,996
237	5,461,997
306	5,461,998

CLASS 114

249	5,462,000
253	5,462,001
260	5,462,002
316	5,462,003

CLASS 116

63 R	5,462,004
200	5,462,005
234	5,462,006
239	5,462,007

CLASS 117

2	5,462,008
7	5,462,009
14	5,462,010
18	5,462,011
85	5,462,012

CLASS 118

31.5	5,462,597
249	5,462,594
264	5,462,595
310	5,462,596
324	5,462,598
503	5,462,599
697	5,462,601
718	5,462,602
719	5,462,013
725	5,462,014

CLASS 119

19	5,462,015
28.5	5,462,016
57.4	5,462,017
86	5,462,018
795	5,462,019
850	5,462,020

CLASS 123

3	5,462,021
90.17	5,462,022
143 C	5,462,023
179.14	5,462,024
321	5,462,025
396	5,462,026
432	5,462,027
447	5,462,028
450	5,462,029
457	5,462,030
478	5,462,031
501	5,462,032
502	5,462,033
520	5,462,034
561	5,462,035
609	5,462,036
673	5,462,037
681	5,462,038
686	5,462,039
688	5,462,040

CLASS 124

44.5	5,462,041
76	5,462,042

CLASS 126

110 R	5,462,043
262	5,462,044
378	5,462,045
501	5,462,046
639	5,462,047

CLASS 128

201.13	5,462,048
205.27	5,462,049
207.18	5,462,050
630	5,462,051
632	5,462,052
653.2	4,715,383
653.4	5,462,053
653.5	5,462,054
659	5,462,056
661.01	5,462,057
661.08	5,462,058
661.09	5,462,059
702	5,462,060
720	5,462,061
754	5,462,062
756	5,462,063
771	5,462,064
782	5,462,065
848	5,462,066
861	5,462,067
881	5,462,068
893	5,462,069

CLASS 131

76	5,462,070
280	5,462,071
334	5,462,072
374	5,462,073

CLASS 134

1	5,462,604
6	Re.35,073
7	5,462,605
18	5,462,606
22.12	5,462,607

CLASS 136

203	5,462,608

CLASS 137

2	5,462,075
15	5,462,077
209	5,462,078
216	5,462,079
337	5,462,080
454.5	5,462,076
498	5,462,081
557	5,462,082
580	5,462,083
614.03	5,462,084
625.43	5,462,085
865	5,462,086
884	5,462,087

CLASS 138

39	5,462,088
109	5,462,089
121	5,462,090
126	5,462,091
177	5,462,092

CLASS 139

57	5,462,093
194	5,462,094
435.4	5,462,095
452	5,462,096
455	5,462,097

CLASS 140

119	5,462,098

CLASS 141

3	5,462,099

59	5,462,100
364	5,462,101

CLASS 144

287	5,462,102

CLASS 148

241	5,462,609
301	5,462,610
325	5,462,611
439	5,462,612
500	5,462,613
551	5,462,614
592	5,462,615

CLASS 150

154	5,462,103

CLASS 152

563	5,462,104

CLASS 156

85	5,462,616
96	5,462,617
161	5,462,618
172	5,462,619
180	5,462,620
229	5,462,621
245	5,462,622
250	5,462,623
257	5,462,624
264	5,462,625
272.8	5,462,626
275.7	5,462,627
281	5,462,628
345	5,462,629
421.2	5,462,630
505	5,462,631
566	5,462,632
577	5,462,633
656.1	5,462,638
662.1	5,462,639

CLASS 160

323.1	5,462,105

CLASS 162

40	5,462,641
116	5,462,642

CLASS 164

15	5,462,106
63	5,462,107
98	5,462,108
479	5,462,109

CLASS 165

48.1	5,462,110
104.14	5,462,111
167	5,462,112

CLASS 166

53	5,462,114
177.3	5,462,115
249	5,462,116
297	5,462,117
312	5,462,118
348	5,462,119
380	5,462,120
383	5,462,121

CLASS 172

2	5,462,122
454	5,462,123
569	5,462,124
826	5,462,125

CLASS 173

53	5,462,126
162.2	5,462,127

CLASS 174

36	5,463,186
88 R	5,463,187
108	5,463,188
138 G	5,463,189
259	5,463,190
263	5,463,191

CLASS 175

67	5,462,129
323	5,462,130
339	5,462,128

CLASS 177

25.14	5,463,192

CLASS 180

14.4	5,462,131
149	5,462,132

CLASS 181

207	5,463,193
240	5,463,194

CLASS 182

172	5,462,133
178	5,462,134
187	5,462,135

CLASS 187

223	5,462,136

CLASS 188

72.6	5,462,137
77 R	5,462,138
206 R	5,462,139
275	5,462,140
280	5,462,141
299	5,462,142
377	5,462,144

CLASS 192

3.29	5,462,145
4 A	5,462,146
18 A	5,462,147
48.3	5,462,148

CLASS 194

206	5,462,149
318	5,462,151

CLASS 198

409	5,462,152
597	5,462,153
699	5,462,154
760	5,462,155
788	5,462,156

CLASS 200

5 A	5,463,195
43.16	5,463,196
531	5,463,198

CLASS 203

72	5,462,643

CLASS 204

131	5,462,644
153.12	5,462,645
180.1	5,462,646

CLASS 205

74	5,462,647
75	5,462,648
93	5,462,649

CLASS 206

210	5,462,157
307	5,462,158
310	5,462,159
312	5,462,160
339	5,462,162
370	5,462,163
389	5,462,164
410	5,462,165
440	5,462,166
455	5,462,167
457	5,462,168
521	5,462,169
574	5,462,170
592	5,462,171
705	5,462,161

CLASS 208

58	5,462,650
143	5,462,651
167	5,462,652

CLASS 209

12.1	5,462,172
39	5,462,173
394	5,462,174
399	5,462,175
577	5,462,176

CLASS 210

85	5,462,653
97	5,462,654
150	5,462,656
167	5,462,655
170	5,462,657
172	5,462,658
198.2	5,462,659
206	5,462,661
223	5,462,662
230	5,462,663
274	5,462,664
496	5,462,665
602	5,462,666
622	5,463,176
645	5,462,667
696	5,462,668
703	5,462,669
713	5,462,670
717	5,462,671
727	5,462,672
739	5,462,673
747	Re.35,074
748	5,462,674
767	5,462,675
774	5,462,676
791	5,462,677
798	5,462,678

CLASS 211

40	5,462,177
95	5,462,178
126	5,263,595

CLASS 213

62 R	5,462,179

CLASS 215

12.1	5,462,180
204	5,462,181
216	5,462,182
237	5,462,183
252	5,462,184
307	5,462,185
330	5,462,186
350	5,462,187

CLASS 216

17	5,462,636
22	5,462,637
67	5,462,635
85	5,462,634
103	5,462,640

CLASS 218

158	5,463,199

CLASS 219

56.22	5,463,197
121.68	5,463,200
121.83	5,463,201
202	5,463,203
502	5,463,205
553	5,463,206
708	5,463,207

CLASS 220

1.5	5,462,188
3.2	Re.35,075
254	5,462,189
375	5,462,190
469	5,462,191
526	5,462,192
652	5,462,193
709	5,462,194
752	5,462,195

CLASS 221

1	5,462,196
46	5,462,197
130	5,462,198

CLASS 222

54	5,462,199
83	5,462,200
95	5,462,201
109	5,462,202
137	5,462,203
145.1	5,462,205
146.5	5,462,206
148	5,462,207
207	5,462,208
376	5,462,209
380	5,462,210

CLASS 224

42.14	5,462,211
155	5,462,213
224	5,462,214
570	5,462,212

CLASS 227

176	5,462,215

CLASS 228

47.1	5,462,216
49.5	5,462,219
180.22	5,462,217

CLASS 229

23 C	5,462,218
92.3	4,784,317
112	5,462,220
117.16	5,462,221
125.39	5,462,222
160.1	5,462,223

CLASS 235

380	5,463,208
383	5,463,209
441	5,463,210
462	5,463,211
468	5,463,212
472	5,463,214

CLASS 236

12.13	5,462,224
47	5,462,225
93 R	5,462,226

CLASS 239

227	5,462,227
285	5,462,228
397.5	5,462,229
428.5	5,462,230
585.4	5,462,231
662	5,462,232

CLASS 241

18	5,462,233
19	5,462,234
30	5,462,235
34	5,462,236
57	5,462,237
243	5,462,238

CLASS 242

18 R	5,462,239
348.1	5,462,240
533.7	5,462,241

CLASS 244

108	5,462,242
121	5,462,243

CLASS 246

122 R	5,462,244
448	5,462,245

CLASS 248

49	5,462,246
118	5,462,247
161	5,462,248
316.7	5,462,249
371	5,462,250

CLASS 250

206.1	5,463,215
208.1	5,463,216
234	5,463,217
281	5,463,218
288	5,463,220
310	5,463,221
330	5,463,222
339.12	5,463,223
366	5,463,224
370.11	5,463,225
374	5,463,226
559.29	5,463,227
577	5,463,228

CLASS 251

4	5,462,251
25	5,462,252
121	5,462,253
144	5,462,254
149.6	5,462,255
331	5,462,256

CLASS 252

9	5,462,680
11	5,462,681
18	5,462,682
25	5,462,683
51.5 R	5,462,684
62.56	5,462,685
62.62	5,462,686
79	5,462,687
89.1	5,462,688
90	5,462,689
126	5,462,690
174.15	5,462,691
186.26	5,462,692
190	5,462,693
299.61	5,462,694
299.65	5,462,695
500	5,462,696
528	5,462,697
586	5,462,698
609	5,462,699

CLASS 254

8 B	5,462,257

CLASS 256

13.1	5,462,258

CLASS 257

59	5,463,229
66	5,463,230
138	5,463,231
223	5,463,232
254	5,463,233
296	5,463,234
300	5,463,235
306	5,463,236
336	5,463,237
351	5,463,238
355	5,463,239
369	5,463,240
376	5,463,241
448	5,463,242
524	5,463,243
530	5,463,244
620	5,463,245
621	5,463,246
666	5,463,247
677	5,463,248
690	5,463,249
698	5,463,250
717	5,463,251
723	5,463,252
724	5,463,253
757	5,463,254
773	5,463,255

CLASS 264

1.27	5,462,700
36	5,462,702
41	5,462,704
122	5,462,705
138	5,462,706
146	5,462,707
174.11	5,462,708
211	5,462,709
297.2	5,462,710
482	5,462,701

CLASS 266

45	5,462,259
226	5,462,260

CLASS 267

140.13	5,462,261

CLASS 269

69	5,462,263
249	5,462,264

CLASS 270

53	5,462,265
54	5,462,266

CLASS 271

10.04	5,462,267
225	5,462,268
274	5,463,256

CLASS 273

15 R	5,462,269
23 C	5,462,274
55 R	5,462,272
58 H	5,462,273
94	5,462,275
108	5,462,276
121 B	5,462,277
138 R	5,462,278
164.1	5,462,279
187.2	5,462,280
238	5,462,281
240	5,462,282
371	5,462,283
413	5,462,284
459	5,462,285

CLASS 277

37	5,462,287
65	5,462,289
95	5,462,290
100	5,462,291
181	5,462,292

CLASS 279

4.03	5,462,293
51	5,462,294

CLASS 280

11.19	5,462,295
11.2	5,462,296
47.34	5,462,298
47.35	5,462,299
87.051	5,462,300
149.2	5,462,301
277	5,462,302
455.1	5,462,303
609	5,462,304
728.2	5,462,305
736	5,462,306
737	5,462,307
749	5,462,308
759	5,462,309
808	5,462,310

CLASS 285

7	5,462,311
15	5,462,312
21	5,462,313
24	5,462,315
81	5,462,316
177	5,462,317

CLASS 290

55	5,463,257

CLASS 292

200	5,462,318
264	5,462,319
285	5,462,320
288	5,462,321
292	5,462,323

CLASS 293

15	5,462,324
102	5,462,325

CLASS 294

1.1	5,462,326
27.1	5,462,327
143	5,462,328

CLASS 296

98	5,462,329
172	5,462,330
198	5,462,331

CLASS 297

216.1	5,462,332
216.11	5,462,333
252	5,462,334
284.4	5,462,335
302.4	5,462,336
344.13	5,462,337
411.37	5,462,338
452.55	5,462,339
478	5,462,340

CLASS 303

9.75	5,462,341
113.2	5,462,342
114.1	5,462,343
119.2	5,462,344

CLASS 305

56	5,462,345

CLASS 307

10.1	5,463,258
106	5,463,259
121	5,463,260
131	5,463,261

CLASS 310

156	5,463,262
181	5,463,263
242	5,463,264
323	5,463,265
359	5,463,266

CLASS 312

247	5,462,347
301	5,462,348
348.1	5,462,349
351.7	5,462,350

CLASS 313

141	5,463,267
293	5,463,268
309	5,463,269
318.01	5,463,270
346 R	5,463,271
373	5,463,272
461	5,463,273
493	5,463,274
495	5,463,275
496	5,463,276

CLASS 315

169.1	5,463,277
169.3	5,463,279
187	5,463,280
209 R	5,463,281
240	5,463,284
248	5,463,285
295	5,463,286
308	5,463,287
382	5,463,288
384	5,463,289
411	5,463,290
502	5,463,291

CLASS 318

34	5,463,292
285	5,463,293
432	5,463,294
568.13	5,463,297
568.2	5,463,296
599	5,463,298
618	5,463,299
801	5,463,300
807	5,463,302

CLASS 320

2	5,463,303
4	5,463,304
21	5,463,305

CLASS 323

222	5,463,306
300	5,463,307
312	5,463,308
315	5,463,309

CLASS 324

95	5,463,310
96	5,463,311
117 R	5,463,313
146	5,463,314
158.1	5,463,315
244.1	5,463,316
301	5,463,318
339	5,463,319
366	5,463,320
439	5,463,321
520	5,463,317
522	5,463,322
611	5,463,323
754	5,463,324
761	5,463,325

CLASS 326

30	5,463,326
37	5,463,327
41	5,463,328
77	5,463,329
81	5,463,330
86	5,463,331
126	5,463,332

CLASS 327

78	5,463,333
106	5,463,334
143	5,463,335
158	5,463,337
202	5,463,338
206	5,463,339
211	5,463,340
219	5,463,341
269	5,463,342
270	5,463,343
374	5,463,344
553	5,463,346

CLASS 330

51	4,988,952
253	5,463,347
254	5,463,349
296	5,463,350

CLASS 331

1 A	5,463,351
1 R	5,463,352
2	5,463,353
65	5,463,354
96	5,463,360

CLASS 332

103	5,463,355
117	5,463,356
151	5,463,357

CLASS 333

1	5,463,358
32	5,463,359
193	5,463,361

CLASS 334

47	5,463,362

CLASS 335

299	5,463,363

CLASS 336

98	5,463,365

CLASS 337

176	5,463,366

CLASS 338

308	5,463,367

CLASS 340

309.15	5,463,368
384.7	5,463,369
426	5,463,371
428	5,463,372
439	5,463,370
441	5,463,373
442	5,463,374
517	5,463,375
572	5,463,376
573	5,241,300
605	5,463,377
618	5,463,378
657	5,463,379
825.15	5,463,381
825.44	5,463,380
903	5,463,384
933	5,463,385

CLASS 341

26	5,463,386
31	5,463,387
33	5,463,388
51	5,463,389
110	5,463,392
115	5,463,393
136	5,463,394
156	5,463,395

CLASS 342

15	5,463,396
25	5,463,397
46	5,463,398
132	5,463,399
352	5,463,400
359	5,463,401

CLASS 343

700 MS	5,463,404
715	5,463,405
725	5,463,406
786	5,463,407

CLASS 345

52	5,463,408
167	5,463,409

CLASS 347

43	5,463,412
65	5,463,411
68	5,463,414
74	5,463,415
100	5,463,416
133	5,463,410
212	5,463,417
244	5,463,418

CLASS 348

70	Re.35,076
128	5,463,429
233	5,463,419
294	5,463,420
296	5,463,421
390	5,463,422
465	5,463,423
485	5,463,424
515	5,463,425
625	5,463,426
806	5,463,427

CLASS 351

158	5,463,428
208	5,463,430
226	5,463,431

CLASS 352

243	5,463,432

CLASS 353

84	5,463,433
94	5,463,434

CLASS 354

21	5,463,435
81	5,463,436
149.11	5,463,437
221	5,463,438
288	5,463,439
298	5,463,440
321	5,463,441
400	5,463,442
430	5,463,443

CLASS 355

27	5,463,444
71	5,463,445
200	5,463,446
202	5,463,447
203	5,463,449
219	5,463,450
233	5,463,451
246	5,463,452
256	5,463,453
290	5,463,454
299	5,463,455
313	5,463,457

CLASS 356

28	5,463,458
237	5,463,459
339	5,463,460
349	5,463,461
354	5,463,462
375	5,463,463
376	5,463,464
394	5,463,465
440	5,463,466
446	5,463,467

CLASS 358

296	5,463,468
298	5,463,470
300	5,463,473
310	5,463,474
325	5,463,475
426	5,463,476
431	5,463,477
442	5,463,295
455	5,463,478
518	5,463,479
520	5,463,480

CLASS 359

51	5,463,482
53	5,463,481
58	5,463,483
68	5,463,484
107	5,463,485
117	5,463,486
124	5,463,487
128	5,463,488
173	5,463,489
200	5,463,490
296	5,463,491
312	5,463,493
359	5,463,494
429	5,463,495
497	5,463,496
618	5,463,497
622	5,463,498
652	5,080,472
692	5,463,499
744	5,463,500
814	5,463,501
819	5,463,502
838	5,463,503

CLASS 360

65	5,463,504
73.04	5,463,505
77.17	5,463,506
97.02	5,463,507
99.06	5,463,509
99.07	5,463,510
99.08	5,463,511
104	5,463,512
105	5,463,514
106	5,463,515
113	5,463,516
128	5,463,519

CLASS 361

56	Re.35,077 5,463,520
58	5,463,521
103	5,463,522
149	5,463,523
230	5,463,524
234	5,463,525
685	5,463,527
699	5,463,528
704	5,463,529
707	5,463,530
737	5,463,531
800	5,463,532
825	5,463,533

CLASS 362

32	5,463,534
102	5,463,535
103	5,463,537
106	5,463,538
189	5,463,539
260	5,463,540
369	5,463,541

CLASS 363

60	5,463,542

CLASS 364

32	5,463,601
141	5,463,543
147	5,463,544
187	5,463,545
407	5,463,546
408	5,463,547
413.02	5,463,548
422	5,463,549
426.01	5,463,550
426.02	5,463,551
436	5,463,552
444	5,463,553
468	5,463,555
470	5,463,556
472	5,463,558
483	5,463,559
489	5,463,560
490	5,463,563
496	5,463,564
514 R	5,463,565
516	5,463,566
551.01	5,463,567
561	5,463,568
724.1	5,463,569
745	5,463,570
746.2	5,463,571
748	5,463,574
754	5,463,575

CLASS 365

63	5,463,576
122	5,463,578
185.01	5,463,579
189.01	5,463,580
189.05	5,463,582
189.06	5,463,583
201	5,463,585
210	5,463,586
226	5,463,588
230.01	5,463,589
230.03	5,463,590
230.05	5,463,591
230.06	5,463,592

CLASS 366

101	5,462,351
131	5,462,352
209	5,462,353
314	5,462,354
343	5,462,355
348	5,462,356

CLASS 367

13	5,463,593
38	5,463,594
93	5,463,595
98	5,463,596
107	5,463,597
131	5,463,598

CLASS 369

7	5,463,599
13	5,463,600
44.29	5,463,602
48	5,463,603
50	5,463,604
58	5,463,605
59	5,463,606
60	5,463,607
109	5,463,608
112	5,463,609
121	5,463,610
191	5,463,611
219	5,463,612
266	5,463,613
275.4	5,463,614

CLASS 370

16	5,463,615
24	5,463,616
29	5,463,617
32.1	5,463,618
58.1	5,463,619
60	5,463,620
60.1	5,463,622
79	5,463,623
85.13	5,463,625
85.6	5,463,624
94.1	5,463,626
105.1	5,463,627
110.1	5,463,628
112	5,463,630

CLASS 371

5.1	5,463,631
20.1	5,463,632
20.3	5,463,633
20.6	5,463,634
21.1	5,463,635
22.3	5,463,638
27.004	5,463,639
37.1	5,463,640
40.1	5,463,642
40.4	5,463,644
67.1	5,463,645
69.1	5,463,646
374	5,463,641

CLASS 372

12	5,463,647
38	5,463,648
40	5,463,649
57	5,463,650
92	5,463,651
94	5,463,652

CLASS 373

108	5,463,653

CLASS 374

124	5,462,357
148	5,462,359

CLASS 375

200	5,463,656
202	5,463,659
205	5,463,660
222	5,463,661
257	5,463,658
341	5,463,654
351	5,463,662
356	5,463,663
359	5,463,655
360	5,463,664

CLASS 378

4	5,463,666
58	5,463,667
98.2	5,463,668
205	5,463,669

CLASS 379

27	5,463,670
52	5,463,665
56	5,463,671
59	5,463,672
60	5,463,675
67	5,463,676
88	5,463,677
91	5,463,678
145	5,463,679
165	5,463,680
189	5,463,681
201	5,463,682
202	5,463,684
207	5,463,685
220	5,463,686
433	5,463,687
446	5,463,688

CLASS 380

7	5,463,689
11	Re.35,078
30	5,463,690

CLASS 381

61	5,463,691
68	5,463,692
75	5,463,693
92	5,463,694
106	5,463,695

CLASS 382

166	5,463,701
186	5,463,696
199	5,463,697
232	5,463,700
239	5,463,702
246	5,463,699
251	5,463,703
276	5,463,698

CLASS 383

63	5,462,360

CLASS 384

9	5,462,361
13	5,462,362
91	5,462,363
111	5,462,364
294	5,462,365
457	5,462,366
459	5,462,367
512	5,462,368
538	5,462,369
549	5,462,370

CLASS 385

14	5,463,705
22	5,463,704
32	5,463,706
35	5,463,707
49	5,463,708
85	5,463,709
90	5,463,710
101	5,463,711
117	5,463,712

CLASS 395

2.18	5,463,716
2.69	5,463,713
2.74	5,463,714
2.76	5,463,715
23	5,463,718
24	5,463,717
51	5,463,719
109	5,463,720
127	5,463,721
133	5,463,722
134	5,463,723
148	5,463,724
155	5,463,725
156	5,463,727
158	5,463,728
161	5,463,729
163	5,463,732
182.02	5,463,763
182.04	5,463,765
182.08	5,463,733
182.13	5,463,764
183.01	5,463,636
183.13	5,463,767
184.01	5,463,775
185.02	5,463,762
200.08	5,463,754
200.1	5,463,735
200.19	5,463,734
281	5,463,742
285	5,463,743
299	5,463,740
375	5,463,744
401	5,463,751
430	5,463,757
437	5,463,749
441	5,463,758
461	5,463,759
473	5,463,753
475	5,463,755
481	5,463,752
494	5,463,756
496	5,463,737
500	5,463,760
550	5,463,761
600	5,463,770
650	5,463,766
700	5,463,769
775	5,463,778
823	5,463,738
826	5,463,739
848	5,463,736

CLASS 400

62.4	5,462,373
569	5,462,371
615.2	5,462,372
625	5,462,374
680	5,462,375

CLASS 401

65	5,462,376
185	5,462,377
201	5,462,378
213	5,462,379

CLASS 403

329	5,462,380
365	5,462,381

CLASS 404

2	5,462,382
4	5,462,383
6	5,462,384
25	5,462,385
26	5,462,386
90	5,462,387
113	5,462,388

CLASS 405

183	5,462,389
264	5,462,390
302.2	5,462,391

CLASS 408

76	5,462,392
159	5,462,393

CLASS 410

59	5,462,394

CLASS 411

107	5,462,395

CLASS 413

67	5,462,396

CLASS 414

222	5,462,397
462	5,462,398
790.3	5,462,399
796.5	5,462,400
797	5,462,401

CLASS 415

90	5,462,402
173.1	5,462,403
183	5,462,404

CLASS 416

97 R	5,462,405
111	5,462,406
132 A	5,462,407
134 A	5,462,408
144	5,462,409
165	5,462,410
202	5,462,411
210 R	5,462,412

CLASS 417

310	5,462,413

313	5,462,414
360	5,462,415
477.2	5,462,416
477.7	5,462,417

CLASS 418

55.3	5,462,418
55.4	5,462,419
83	5,462,420

CLASS 420

528	5,462,712

CLASS 422

1	5,462,711
37	5,462,713
64	5,462,715
102	5,462,716
146	5,462,717
171	5,462,718
195	5,462,719

CLASS 423

10	5,463,177
27	5,462,720
226	5,462,721
311	5,462,722
347	5,462,723

CLASS 424

1.77	5,462,724
9.363	5,462,725
45	5,462,727
49	5,462,728
61	5,462,729
78.35	5,462,730
85.2	5,462,731
93.2	5,462,732
93.71	5,462,733
229.1	5,462,734
255.1	5,462,735
401	5,462,736
409	5,462,738
427	5,462,739
436	5,462,740
438	5,462,741
439	5,462,742
448	5,462,743
449	5,462,746
465	5,462,747
484	5,462,748
493	5,462,750
494	5,462,751
532	5,462,752
670	5,462,753

CLASS 425

4 R	5,462,421
129.1	5,462,422
141	5,462,423
150	5,462,424
183	5,462,425
190	5,462,426
231	5,462,427
567	5,462,428

CLASS 426

4	5,462,754
36	5,462,755
129	5,462,756
486	5,462,757
557	5,462,758
568	5,462,759
572	5,462,760
573	5,462,761

CLASS 427

63	5,462,762
96	5,462,763
196	5,462,764
198	5,462,765
244	5,462,766
248.1	5,462,767
265	5,462,768
307	5,462,769
407.1	5,462,770
537	5,462,771
554	5,462,772
555	5,462,773
573	5,462,775
577	5,462,776

CLASS 428

2	5,462,777
17	5,462,778
34.7	5,462,779
35.8	5,462,780
36.1	5,462,781
40	5,462,782
65.5	5,462,784
76	5,462,785
134	5,073,433
171	5,462,786
195	5,462,787
201	5,462,788
209	5,462,789
216	5,463,178
229	5,462,790
259	5,462,791
297	5,462,792
317.1	5,462,794
332	5,462,795
336	5,462,796
345	5,462,797
364	5,462,798
372	5,462,801
376	5,462,802
380	5,462,803
402.24	5,462,804
408	5,462,800
430	5,462,805
451	5,462,806
500	5,462,807
546	5,462,809
551	5,462,808
694 EC	5,462,811
694 T	5,462,810
696	5,462,812
698	5,462,813

CLASS 429

7	5,462,814
13	5,462,815
18	5,462,816
19	5,462,817
104	5,462,818
174	5,462,819
192	5,463,179
218	5,462,821

CLASS 430

7	5,462,822
14	5,462,823
58	5,462,825
59	5,462,826
65	5,462,827
106	5,462,828
109	5,462,829
110	5,462,830
139	5,462,831
159	5,462,833
176	5,462,834
287	5,462,835
306	5,462,836
311	5,462,837
313	5,462,838
320	5,462,839
326	5,462,840
396	5,462,841
501	5,462,824
503	5,462,842
505	5,462,845
507	5,462,846
508	5,462,847
546	5,462,848
567	5,462,849
569	5,462,850
584	5,462,851

CLASS 431

3	5,462,429
10	5,462,430
43	5,462,431
153	5,462,432

CLASS 432

99	5,462,433

CLASS 433

8	5,011,403
97	5,462,434
140	5,462,435
141	5,462,436
207	5,462,437

CLASS 434

430	5,462,438

CLASS 435

5	5,462,852
6	5,462,854
7.21	5,462,856
16	5,462,858
29	5,462,859
34	5,462,860
41	5,462,861
69.1	5,462,862
69.3	5,462,863
100	5,462,864
125	5,462,865
174	5,462,866
181	5,462,867
196	5,462,868
212	5,462,869
240.2	5,462,870
254.2	5,462,873
289.1	5,462,875
297.5	5,462,874

CLASS 436

93	5,462,877
131	5,462,878
136	5,462,879
138	5,462,880
180	5,462,881

CLASS 437

5	5,462,882
21	5,462,883
39	5,462,884
40	5,462,885
41	5,462,886
48	5,462,887
57	5,462,888
60	5,462,889
187	5,462,890
189	5,462,892
195	5,462,893
200	5,462,895
228	5,462,896
230	5,462,897
235	5,462,898
238	5,462,899
249	5,462,900

CLASS 439

34	5,462,439
66	5,462,440
67	5,462,441
69	5,462,442
78	5,462,443
108	5,462,444
188	5,462,445
264	5,462,446
347	5,462,447
357	5,462,448
489	5,462,450
493	5,462,451
505	5,462,452
510	5,462,453
571	5,462,454
681	5,462,455
733.1	5,462,456
736	5,462,457
752	5,462,458
843	5,462,459

CLASS 440

6	5,462,460
38	5,462,461
49	5,462,462
80	5,462,463
88	5,462,464
111	5,462,465

CLASS 441

76	5,462,466

CLASS 445

50	5,462,467
59	5,462,468

CLASS 446

15	5,462,469
26	5,462,471
135	5,462,472
183	5,462,473

CLASS 451

41	5,462,474
294	5,462,470
384	5,462,475
558	5,462,476

CLASS 452

135	5,462,477
160	5,462,479

CLASS 453

49	5,462,480

CLASS 454

70	5,462,481
143	5,462,482
160	5,462,483
187	5,462,484
256	5,462,485

CLASS 460

20	5,462,486
105	5,462,487

CLASS 462

26	5,462,488

CLASS 464

179	5,462,489

CLASS 473

49	5,462,490
126	5,462,491

CLASS 474

38	5,462,492
111	5,462,493
135	5,462,494
209	5,462,495

CLASS 475

204	5,462,496
252	5,462,497
342	5,462,498

CLASS 477

120	5,462,499
134	5,462,500
155	5,462,501
197	5,462,502

CLASS 482

4	5,462,503
7	5,462,504
27	5,462,505
51	5,462,506
104	5,462,507
122	5,462,508
132	5,462,509
142	5,462,510

CLASS 483

1	5,462,511
57	5,462,512

CLASS 494

56	5,462,513

CLASS 501

87	5,462,901
92	5,462,902
127	5,462,903

CLASS 502

222	5,462,904
232	5,462,905
304	5,462,907
401	5,462,908

CLASS 503

201	5,462,909
227	5,462,910

CLASS 504

116	5,462,912
138	5,462,913
238	5,462,914
323	5,462,915

CLASS 505

150	5,462,917
171	5,463,518
182	5,462,916
193	5,462,918
410	5,462,919
432	5,462,920
473	5,462,921
785	5,462,922

CLASS 512

19	5,462,923

CLASS 514

12	5,462,925
16	5,462,926
17	5,462,927
19	5,462,928
43	5,462,929
63	5,462,931
108	5,462,932
125	5,463,181
176	5,462,933
183	5,462,934
206	5,462,935
211	5,462,936
212	5,462,937
229.8	5,462,938
231.5	5,462,939
235.8	5,462,940
248	5,462,941
254	5,462,942
256	5,462,943
275	5,462,944
277	5,462,945
315	5,462,946
317	5,462,947
323	5,462,948
324	5,462,949
334	5,462,951
364	5,462,952
379	5,462,953
381	5,462,954
383	5,462,955
397	5,462,956
399	5,462,958
400	5,462,959
406	5,462,960
407	5,462,961
411	5,462,962
423	5,462,964
443	5,462,965
483	5,462,966
533	5,463,104
547	5,462,967
558	5,462,726
568	5,462,968
575	5,462,969
654	5,462,970

CLASS 521

40	5,462,971
53	5,462,972
62	5,462,973
79	5,462,974
90	5,462,975

CLASS 522

74	5,462,976
160	5,462,977

CLASS 523

342	5,462,978
438	5,462,979

CLASS 524

47	5,462,980
51	5,462,983
102	5,462,984
141	4,318,836
204	5,462,985
296	5,462,986
451	5,462,987
501	5,462,988
707	5,462,989

CLASS 525

54.1	5,462,990
54.3	5,462,991
176	5,462,992
274	5,462,993
314	5,462,994
330.4	5,463,182
332.1	5,462,995
423	5,462,996
507	5,462,997

CLASS 526

67	5,462,998
68	5,462,999
119	5,463,000
124.5	5,463,001
161	5,463,002
176	5,463,003
240	5,463,005
247	5,463,006
266	5,463,007
268	5,463,008

CLASS 528

15	5,463,009
25	5,463,010
44	5,463,011
196	5,463,012
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308.2	5,463,015
353	5,463,016
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373	5,463,018
402	5,463,019
408	5,463,020
482	5,463,021

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327	5,463,023
350	5,463,024
380	5,463,025
387.9	5,463,026
388.9	5,463,027
405	5,463,028
416	5,463,029

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618	5,463,031
642	5,463,032

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55.3	5,463,035
86	5,463,036
90	5,463,037
124	5,463,038

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362	5,463,047
456	5,463,048
556	5,463,049
575	5,463,050
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101	5,463,053
250	5,463,054
299	5,463,055
350	5,463,056

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201	5,463,063
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304	5,463,065

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236	5,463,070
251	5,463,071
255	5,463,072
303.7	5,463,073
314.7	5,463,074
365.1	5,463,075
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515	5,463,077
541	5,463,078
543	5,463,079
545	5,463,080

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336	5,463,087
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560	5,463,091

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341	5,463,103

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385	5,463,136
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176	5,463,152
227	5,463,153

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261	5,463,154
310	5,463,155
400	5,463,156
511	5,463,157
520	5,463,158
648	5,463,159
671	5,463,160
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748	5,463,166
823	5,463,167
854	5,463,168

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202	5,463,169
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249	5,463,163
250	5,463,164
252	5,463,172

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CLASS 601

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391	5,462,541

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D2	604	363,591
	639	363,592
	829	363,593
	852	363,594
	869	363,595
	884	363,596
D3	5	363,597
	215	363,598
	246	363,599
	254	363,600
	264	363,601
	270	363,602
	303	363,603
	312	363,604
D4	101	363,605
	103	363,606
	108	363,607
	118	363,608
	138	363,609
D5	53	363,610
	60	363,611
D6	300	363,612
	316	363,613
	381	363,614
	405	363,615
	417	363,616
	445	363,617
	446	363,618
	449	363,619
	450	363,620
	477	363,622
	479	363,623
	513	363,627
	522	363,628
	541	363,629
	549	363,630
	604	363,631
	634	363,632
D7	302	363,633
	306	363,634
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	357	363,636
	358	363,637
	391	363,638
	402	363,639
	403	363,640
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	556	363,646
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	612	363,649
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D8	1	363,652
	10	363,653
	14	363,654
	51	363,655
	66	363,656
	354	363,657
	382	363,658
D9	337	363,670
	423	363,661
	425	363,662
	434	363,660
	447	363,671
	449	363,666
	479	363,625
	542	363,667
	544	363,668
D10	33	363,677
	53	363,678
	62	363,679
	75	363,676
	78	363,681
	80	363,682
	97	363,672
	104	363,673
	106	363,674
	114	363,675
D11	88	363,683
	90	363,684
	118	363,685
	143	363,687
	148	363,689
	216	363,690
D12	126	363,691
	129	363,692
	180	363,693
	189	363,694
	317	363,695
	331	363,696
	400	363,697
	419	363,698
D13	120	363,699
	147	363,700
	154	363,701
	183	363,702
D14	100	363,703
	102	363,707
	113	363,709
	114	363,710
	118	363,713
	129	363,714
	135	363,715
	138	363,716
	149	363,717
	187	363,718
	216	363,719
	218	363,720
	226	363,721
	242	363,722
	243	363,723
	257	363,724
D15	123	363,725
	133	363,726
	139	363,727
	140	363,729
D16	202	363,730
D18	7	363,732
	50	363,733
	53	363,735
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D19	27	363,737
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	46	363,740
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D20	5	363,743
D21	13	363,744
	68	363,745
	120	363,746
	191	363,747
	214	363,748
	234	363,751
	236	363,752
	237	363,753
	255	363,755
D22	142	363,756
D23	207	363,757
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	233	363,761
	243	363,763
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	255	363,766
	260	363,767
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	262	363,770
	269	363,771
	355	363,772
	370	363,773
D24	110	363,774
	140	363,776
	146	363,777
	172	363,778
	189	363,779
	192	363,780
	197	363,781
	199	363,782
	214	363,783
D25	38	363,789
	56	363,790
	64	363,784
	69	363,785
	117	363,786
	118	363,787
	119	363,788
	124	363,791
	125	363,798
	164	363,801
D26	25	363,802
	28	363,806
	60	363,803
	63	363,804
	76	363,805
D27	141	363,807
	159	363,808
D28	53	363,809
	63	363,810

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DESIGN PATENTS

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363,722
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363,755
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PLANT PATENTS

06 : 9,344
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12 : 9,355

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